
**“STUDY OF ASSOCIATION OF CLINICAL AND DERMOSCOPIC FINDINGS WITH
NAILFOLD CAPILLAROSCOPY CHANGES IN ACANTHOSIS NIGRICANS: A ONE YEAR
CROSS-SECTIONAL STUDY AT A TERTIARY CARE HOSPITAL.”**

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In

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LIST OF ABBREVIATIONS USED

Sr No.	Abbreviations	Expansion
1	AN	ACANTHOSIS NIGRICANS
2	NFC	NAIL FOLD CAPILLAROSCOPY
3	IR	INSULIN RESISTANCE
4	DM	DIABETES MELLITUS
5	OC	ORAL CONTRACEPTIVES
6	IGF	INSULIN LIKE GROWTH FACTOR
7	NPD	NON-POLARISED DERMOSCOPY
8	PD	POLARISED DERMOSCOPY
9	FAN	FACIAL ACANTHOSIS NIGRICANS
10	NAFLD	NON-ALCOHOLIC FATTY LIVER DISEASE
11	T2DM	TYPE 2 DIABETES MELLITUS
12	MS	METABOLIC SYNDROME
13	PKC	PROTEIN KINASE C
14	TGB β	TRANSFORMING GROWTH FACTOR B
15	ROS	REACTIVE OXYGEN SPECIES
16	BMI	BODY MASS INDEX
17	HOMA-IR	HOMEOSTATIC MODEL ASSESSMENT FOR INSULIN RESISTANCE
18	IGFBP	INSULIN LIKE GROWTH FACTOR BINDING PROTEIN

ABSTRACT

- **Background:** Acanthosis nigricans (AN) is a commonly encountered condition in clinical practice, with numerous systemic disorders associated with it. Not much literature is available with respect to the correlation of clinical and dermoscopic features in AN with nailfold capillaroscopy (NFC) changes. This study will allow us to evaluate patients with acanthosis nigricans having underlying microvascular complications due to metabolic diseases and monitor treatment on AN through dermoscopy.
- **Aims and Objectives:** Primarily to study the association of clinical and dermoscopic findings with nailfold capillaroscopy changes in AN and secondarily to understand the spectrum of nailfold capillaroscopy changes in them.
- **Materials and Methods:** This was a cross-sectional hospital-based study along with a sample size was 97. After taking informed consent from clinically diagnosed AN patients, Clinical Burke's Grading for AN was done. Dermoscopy was done on affected sites using a digital microscope Dinolite AF4115ZT using polarized, nonpolarized mode and images were taken. The findings were noted and graded. NFC was done on all ten fingernails. For study of association 4th and 5th fingernails of each hand were considered.
- **Results:** There was statistically significant positive association of Clinical Burke's Grading (p-value 0.002) and duration (p value- 0.003) of AN with dermoscopy features of AN. On dermoscopy depth of sulci cutis, number of hyperpigmented dots increased and shape of papillary projections changed corresponding to the severity of Burke's clinical grading and duration. NFC changes commonly seen were drop-outs, tortuous,

dilated, cross-linked, ramified capillaries in the given order. Tortuous, crosslinked capillaries showed significant association with Clinical Scale of AN (p value <0.05).

Ramified capillaries and cross-linked capillaries showed significant association with duration of AN (p value <0.05).

- **Limitations:** The status of insulin resistance was not known in all the participants. Nail folds on nail fold capillaroscopy not seen in 14/97 patients.
- **Conclusion:** Dermoscopy in AN showed gradation in changes corresponding to the Clinical Burke's grading and duration. Ramified capillaries, cross linked capillaries showed significant association with duration of AN. Tortuous, crosslinked capillaries showed significant association with clinical scale of AN. The present study helps in furthering the cause that early detection of microvascular changes in cases of AN (suggestive of insulin resistance) using nail fold capillaroscopy can aid in referring the patient for screening of diabetic retinopathy, diabetic nephropathy at the earliest. This study will also aid in monitoring of treatment on AN through dermoscopy.
- **Key words** – Acanthosis Nigricans, Dermoscopy, Nail fold capillaroscopy, insulin resistance, microvascular

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INTRODUCTION

Acanthosis nigricans (AN) is a dermatological condition characterised by increased pigmentation and thickening of the skin, primarily affecting the neck, axilla, and groin. Additionally, areas like the elbows, knees, umbilicus, and perianal areas may also be affected. In advanced cases, AN is also seen on dorsum of hands. ¹

It is a commonly found condition but is often neglected. The darkening of skin is denoted by the term 'nigricans'. The patients present with this condition for cosmetic purposes. Acanthosis term is a misnomer in this condition as acanthosis signifies thickening of stratum spinosum which is absent in this condition. As a number of systemic disorders are associated with it, its detection becomes necessary. ²

Endocrine and metabolic disorders like diabetes mellitus, polycystic ovarian syndrome are underlying systemic diseases in acanthosis nigricans. Genetic disorders like Down's syndrome may present with AN. It can also be induced by drugs like oral contraceptives, nicotinic acid. Malignant disorders like adenocarcinoma can also present with AN. It is a dermatological marker of insulin resistance (IR) as well as hyperinsulinemia. Therefore, its utility lies in detecting cases progressing impaired glucose tolerance and frank diabetes. ²

The prevalence of AN in Indian population is 6.5 per 1000 population. ¹

The dermoscopy features include papillary projections, sulci cutis, crista cutis, hyperpigmented dots and blotches. ²

Nail fold capillaroscopy (NFC) is a non-invasive diagnostic technique to evaluate microvascular complications in diabetes mellitus, metabolic syndrome, rheumatological disorders.³

Introduction

Not much literature is available regarding correlation of clinical and dermoscopic features in AN with nail fold capillaroscopy changes. This study is an attempt to understand the spectrum of nail fold capillaroscopy changes in patients of acanthosis nigricans.

This study will allow us to evaluate patients with acanthosis nigricans having underlying microvascular complications due to metabolic diseases.

AIMS AND OBJECTIVES

Primary objective: To study the association of clinical and dermoscopic findings with nail fold capillaroscopy changes in acanthosis nigricans.

Secondary objective: To study the spectrum of nail fold capillaroscopy changes seen in patients with acanthosis nigricans.

REVIEW OF LITERATURE

Acanthosis nigricans (AN) is a dermatological disorder associated with various causes, identified by the presence of thick velvety plaques which are symmetric, dark and rough. These plaques are typically distributed on the neck, axillary areas, antecubital and popliteal fossae, as well as the inframammary and groin regions.⁴

CLASSIFICATION OF AN

A. Classification given by Curth

- 1) Malignant
- 2) Inherited benign
- 3) Pseudo-associated with obesity as well as syndromic.⁴

B. Classification given by Hernandez-Perez

- 1) Simple (including nevoid /drug associated /obesity associated)
- 2) Paraneoplastic.⁴

C. Classification given by Schwartz

- 1) Benign
- 2) Associated with obesity
- 3) Malignant
- 4) Syndromic associated
- 5) Unilateral
- 6) Acral

7) Mixed

8) Medication-induced ⁴

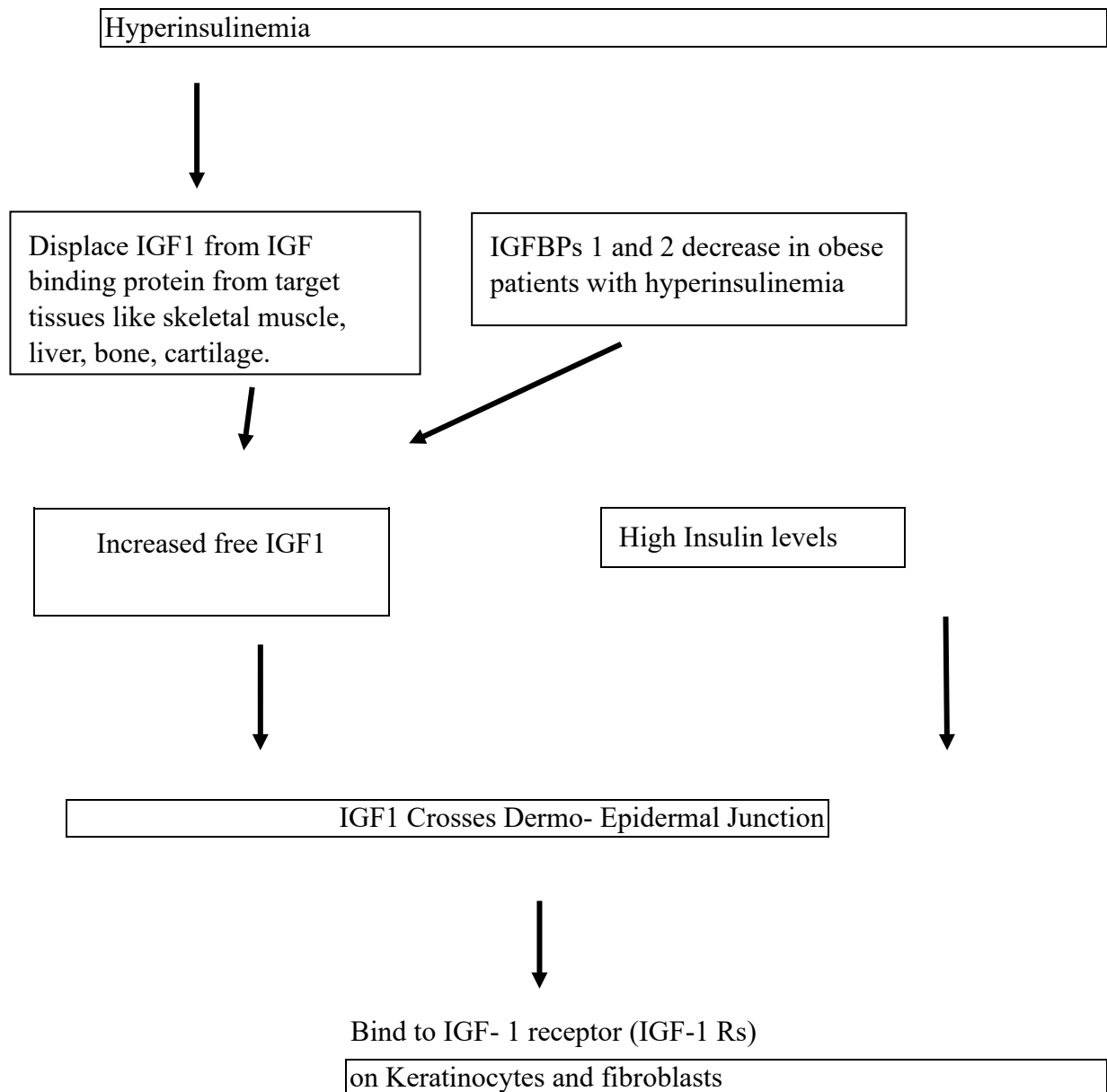
Causes of AN

- (1) Benign – Diabetes Mellitus
- (2) Obesity-associated - most common cause of AN. AN is weight dependent, with reduction succeeding weight reduction. It is commonly associated with insulin resistance.⁵
- (3) Syndromic – Cushing Syndrome, Down Syndrome, Polycystic Ovarian Syndrome, Bloom Syndrome, Prader-Willi Syndrome.⁵
- (4) Malignant- intra-abdominal carcinomas account for 73% and the rest 26% have extra-abdominal tumors. The tumors are mainly adenocarcinomas, with gastric adenocarcinoma detected most frequently and tumors in the lung, cervix/uterus, liver, mammary gland, pancreatic tissue, and colon detected less commonly.⁶
- (5) Acral- Most common in dark-skinned individuals. The lesions are more conspicuous over the dorsal aspects of hands and feet.⁵
- (6) Unilateral (Nevoid)-Autosomal dominant inheritance seen. Lesions become prominent during infancy, childhood, or adulthood. They are unilateral and follow lines of Blaschko.⁵

(7) Medication-induced – Systemic steroids, nicotinic acid, estrogen, insulin, niacin, methyltestosterone, fusidic acid, protease inhibitors, diethylstilbestrol.

(8) Mixed-type⁵

Pathogenesis of Acanthosis Nigricans ⁵



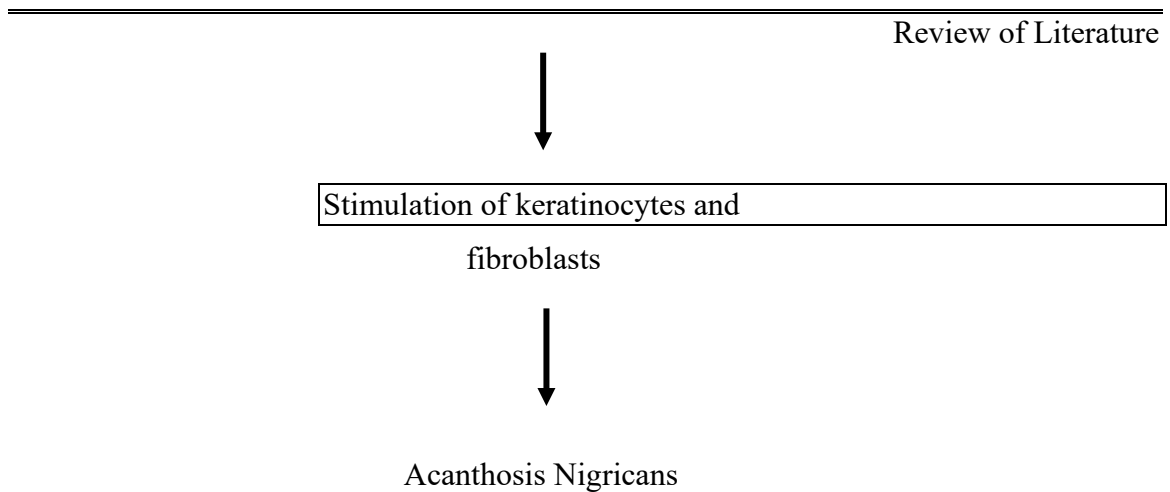


Figure 1- Pathogenesis of AN

EPIDEMIOLOGY

Prevalence- The overall prevalence of AN is 6.5 per 1000 population.¹

Age Distribution- Patients

11 to 20 years -	32.9%,
21 to 30 years -	24.9%,
31 to 40 years -	24.5%,
41 to 50 years -	8.6%,
<10 years -	5.5%,
>50 years -	3.7%.

The youngest and eldest age of presentation of AN is 5 years and 71 years respectively.

Occupation - Students (51%), (28%) housewives, and the rest of the patients of AN are labourers, drivers, businessmen, teachers, government employees, and retired persons.¹

Clinical Features of Acanthosis Nigricans

AN is characterised by the presence of dark, rough and thickened skin displaying a velvet like texture. The early changes involve grey-brown / black pigmentation along with roughness and dryness, presenting as palpable thick skin covered by small papillomatous ridges. As the thickening progresses, skin lines become more distinguished, and the surface develops rugosities. AN is typically asymptomatic although, occasional pruritis may be experienced.⁵

AN exhibits a symmetrical distribution, affecting the posterior aspect and sides of the neck, axillae, groin, antecubital and popliteal regions. The neck is affected most in children, with a prevalence of 99%, compared to the axillae where prevalence is 73%. In addition to these primary sites, the face, flexor and extensor surfaces of elbows and knees, joints of the hands, umbilicus, external genitalia, inner area of thighs, anus are involved. With extensive occurrence, lesions may also manifest over the areolae and mucosae. Involvement of the mucosae is quite rare. The buccal mucosa may exhibit fine velvety furrows.⁵

Tripe palms, characterized by rugose hyperkeratosis and prominent dermatoglyphics on the palms mimicking the lining of a bovine gut, is a paraneoplastic occurrence related to malignancy in 90% of cases. Additionally, periocular distribution is observed in cases linked to insulin resistance (IR) ⁵

BURKE GRADING FOR ACANTHOSIS NIGRICANS ⁷

Table 1: Burke's grading for Acanthosis Nigricans

NECK SEVERITY	
0	ABSENT: NOT DETECTABLE ON CLOSE INSPECTION
1	PRESENT: CLEARLY PRESENT ON CLOSE VISUAL INSPECTION, NOT VISIBLE TO THE CASUAL OBSERVER, EXTENT NOT MEASURABLE
2	MILD: LIMITED TO THE BASE OF THE SKULL, DOES NOT EXTEND TO THE LATERAL MARGINS OF THE NECK (USUALLY ,3 INCHES IN BREADTH)
3	MODERATE: EXTENDING TO THE LATERAL MARGINS OF THE NECK (POSTERIOR BORDER OF THE STERNOCLEIDOMASTOID) (USUALLY 3–6 INCHES), SHOULD NOT BE VISIBLE WHEN THE PARTICIPANT IS VIEWED FROM THE FRONT
4	SEVERE: EXTENDING ANTERIORLY (.6 INCHES), VISIBLE WHEN THE PARTICIPANT IS VIEWED FROM THE FRONT
AXILLA	
0	ABSENT: NOT DETECTABLE ON CLOSE INSPECTION
1	PRESENT: CLEARLY PRESENT ON CLOSE VISUAL INSPECTION, NOT VISIBLE TO THE CASUAL OBSERVER, EXTENT NOT MEASURABLE.
2	MILD: LOCALIZED TO THE CENTRAL PORTION OF THE AXILLA, MAY HAVE GONE UNNOTICED BY THE PARTICIPANT.

3	MODERATE: INVOLVING ENTIRE AXILLARY FOSSA, BUT NOT VISIBLE WHEN THE ARM IS AGAINST THE PARTICIPANT 'S SIDE.
4	SEVERE: VISIBLE FROM FRONT OR BACK IN THE UNCLOTHED PARTICIPANT WHEN THE ARM IS AGAINST THE PARTICIPANT 'S SIDE
NECK TEXTURE	
0	SMOOTH TO TOUCH: NO DIFFERENTIATION FROM NORMAL SKIN TO PALPATION.
1	ROUGH TO TOUCH: CLEARLY DIFFERENTIATED FROM NORMAL SKIN
2	COARSENESS CAN BE OBSERVED VISUALLY, PORTIONS OF THE SKIN CLEARLY RAISED ABOVE OTHER AREAS
3	EXTREMELY COARSE: "HILLS AND VALLEYS" OBSERVABLE ON VISUAL EXAMINATION
KNUCKLE	
PRESENT	
ABSENT	
ELBOW	
PRESENT	
ABSENT	
KNEE	
PRESENT	
ABSENT	

Histopathology Findings in Acanthosis Nigricans ²

Table 2: Histopathology findings in Acanthosis Nigricans

Histopathology	Percentage
Hyperkeratosis	96.8%
Papillomatosis	90.3%
Acanthosis	62.9%
Pigment incontinence	25.8%
Increased basal layer pigment	40.3%
Inflammatory infiltrate	51.6%
Keratotic Plugging	41.9%
Horn Cyst	1.6%

Dermoscope and Dermoscopy

Dermoscopy, a non-invasive method, alternatively referred to as skin surface microscopy, epiluminescence microscopy or dermatoscopy is used for diagnosing skin conditions. It helps visualise deeper structures of skin. In recent years, there has been a growing utilization of dermoscopy in the realm of general dermatological conditions, encompassing inflammatory, pigmentary, and infectious dermatoses, as well as disorders affecting the hair and nails. ⁸

Dermoscopy can be performed using the contact and/or non-contact technique. The glass plate of the device makes direct contact with the lesion's surface in the contact technique, which is typically coated with a linking fluid. Conversely, the non-contact method involves no contact between the lens and the skin. Instead, the cross-polarized lens absorbs the scattered light, enabling light in one plane to transit through it. ⁹

Can be classified as Handheld and videodermatoscope

Non- polarised and Polarised dermoscopy

Non- polarised dermoscopy-

To achieve a reduction in skin surface reflection in Non-Polarized Dermoscopy (NPD), an immersion interface or light cross-polarization technique is utilized. In this process, a liquid interface medium, having a refractive index matching that of the skin, connects the stratum corneum (with a refractive index of 1.55) to a glass plate mounted on the dermoscope (with a refractive index of approximately 1.52).

Polarized Dermoscopy

Polarized light is commonly generated using filters. In Polarized Dermoscopy (PD), cross-polarization is used where two filters: one positioned between the skin and the source of light, and another kept between the light detector and the skin. The polarized light emitted by the 1st filter extends to the skin, where a portion is reflected by the cornified layer of skin, and another part enters the skin, getting backscattered. While the superficially reflected light maintains its polarization and angle of incidence, the backscattered light loses its polarization due to many scatterings in the skin. The 2nd filter, used between the skin and the light detector, only stops the polarized light reflected at the cornified layer while the backscattered component of light can reach the detector (and the eyes).

These filters enable the dermoscope to only catch the backscattered light from deeper layers of the skin while minimizing the picking up of superficially reflected light, which is responsible for the shiny look of the skin.

Dermoscopy of normal skin –

When viewed through a dermatoscope, glabrous skin of ethnic origin exhibits slender lines organized in a reticular formation. These lines correspond to the pigmented basal layer when observed horizontally. Additionally, scattered among these reticular lines are tiny white dots denoting the openings of eccrine ducts.¹⁰

Definitions of dermoscopy findings seen in Acanthosis Nigricans

Table 3 : Dermoscopy findings in Acanthosis Nigricans

Sr No.	Dermoscopy findings in AN	Definition
1	Sulci cutis	Furrows or valleys ²
2	Cristi cutis	Elevated ridges ²
3	Dots	Round small structures with diameter <0.1 mm ¹¹
4	Globules	Well demarcated, round to oval structures, >0.1 mm in diameter ¹²
5	Crypts	Invaginations filled with keratin that are larger than comedo like openings ¹³
6	Blotches	An area with size that is at least 10% of the lesion's surface area and with heavy pigmentation. ¹⁴
7	Streaks	Located at the periphery of lesions, linear pigmented projections ¹⁵

In non-polarized mode, surface alterations are seen as cerebriform appearance, like the texture of the cerebral cortex.¹⁶ Multiple asymmetric blotches and milia like cysts are also seen.¹⁷ Crypts are also seen in non-polarised dermoscopy²

Dermoscopy of AN shows numerous cristi and sulci, which are more clearly seen in nonpolarized mode.¹⁸ Pigmented dots/globules serve as specific indicators for acanthosis nigricans and are more prominently visible in polarized mode.¹⁹

The dots are irregular dots in shape and size.²⁰

Lesions of chronic duration are characterized by thick skin, exophytic papillary structures.²¹

The background colour alternates between dark brown or grey to brown in the crista cutis and hypopigmented in the sulci cutis²²

The white colour of the sulci cutis occurs because of the basket weave pattern of the stratum corneum filling the valleys formed by the downward progression of the epidermis²³

The darker brown or black dots likely indicate significant melanisation within the epidermis. In skin of colour, keratin-filled invaginations appear darker.¹⁹

In mild facial acanthosis nigricans (FAN), there is a less prominent sulci pattern with follicular plugging, irregular brown globules with perifollicular pigmentation. As FAN progresses to moderate severity, sulci start connecting with each other, revealing a pronounced crista pattern, with larger brown globules and increased perifollicular hyperpigmentation. Severe FAN is characterized by rhomboid-shaped islands denoting deep sulci and prominent cristae.²⁴

Nail Fold capillaroscopy

Nail-fold capillaroscopy is a non-intrusive imaging method used to assess microcirculation in vivo. It involves specialized dermoscopy of the proximal nail fold. It delivers incident light at an acute angle and enables the "in vivo" imaging of vascular structures in the superficial papillary dermis, thereby focussing on capillary arrangement and morphology.³

Nail fold capillaroscopy can be executed using a videocapillaroscope or Universal Serial Bus Digital Dermoscope. The later one is easy to use and hence commonly used.

Procedure of Nail Fold Capillaroscopy

- 1) Patient is seated on a chair with hands on the table at the level of heart.
- 2) The nail folds are cleaned by water.
- 3) Interface medium like USG gel, liquid paraffin is applied over the nail folds.
- 4) They are first visualised at low power in polarised mode to find out drop outs, avascular areas.
- 5) Then, visualised at high power to note morphology of capillaries.
- 6) All ten fingernails examined.
- 7) Best changes seen in 4th and 5th nailfolds.
- 8) Changes seen in at least two fingers marked as an abnormal finding.³

Nail Fold capillaroscopy in healthy individuals

The typical physiological appearance of a nailfold capillary loop resembles a hairpin or an inverted elongated "U". It features an arterial and a venous limb linked by an apical loop. This occurs because the papillae on the dorsal surface of the distal appendages bend as they approach the nail, aligning parallel to the skin surface near

the nailfolds. Similarly, capillary loops visualized longitudinally at the edge of the nailfold undergo a comparable bend.²⁵

Capillary morphologies like tortuosity, dilation, meandering, bushy capillaries, might occur in normal individuals. However, their presence in more than two fingers should be regarded as pathological.²⁵

NFC of toenails is not reliable, hence not performed.

Nail Fold capillaroscopy should not be performed in cases of

- 1) Artificial nails and nail polish
- 2) Manicure.
- 3) History of recent injury to the distal phalanges (at least 2 weeks).
- 4) Evidence of recent/old infection.
- 5) Evidence of recent wound.²⁶

Nail Fold capillaroscopy changes seen in

- 1) Dermatological conditions – Psoriasis, Psoriatic arthritis, Alopecia areata
- 2) Rheumatological conditions – Raynaud’s phenomenon, Systemic lupus erythematosus, Dermatomyositis.
- 3) Non- Rheumatological conditions – Diabetes mellitus, Arterial hypertension, Behcet’s disease.³

Definition of NFC findings

- 1) Drop outs – The lack of a capillary loop from its dermal papilla.³

- 2) Tortuous capillary - A capillary limb of the loop which is curled but does not cross itself.³
- 3) Cross linked capillary - The capillary limbs cross each other at one point.²⁷
- 4) Giant capillary – apical diameter of capillary loop $\geq 50 \mu\text{m}$.²⁷
- 5) Haemorrhage - extra-capillary, varied sizes and forms of brown coloured aggregates of clotted blood.³
- 6) Ramified capillary – bushy capillary.²⁸
- 7) Ectasia - presence of capillary loops dilatated by ≥ 4 in comparison with the others.³

Neo-angiogenesis in Nail Fold capillaroscopy

Neoangiogenesis manifests as capillaries with numerous morphologies such as meandering, ramified, or bushy. Bushy capillaries exhibit loops with limbs which originate from multiple tiny buds. In meandering capillaries limbs intersect themselves or other capillaries.³ Vascular damage initiates with endothelial hypoxia, causing a decrease in capillary density and subsequent release of tissue factors such as VEGF, soluble thrombomodulin, endothelin-1. These factors aid in the growth of new capillaries. Compensatory neo-angiogenesis begins, characterized by ramifications and capillary dilatation, which if left uncontrolled, can advance to the recognized microvascular complications.²⁹

Limitations of nail fold capillaroscopy–

- 1) Occasionally, NFC in patients with skin of colour can be challenging due to the limited visibility of nailfold capillaroscopy features.³
- 2) The loss of a panoramic view of the capillary loops restricts examination to only one area of the nailfold region at a time.³⁰

Acanthosis Nigricans and insulin resistance

Insulin resistance (IR) is defined as a condition with decreased response of insulin-targeting tissues to high insulin levels. It is considered as a causative factor of many modern day diseases like non-alcoholic fatty liver disease (NAFLD), atherosclerosis, metabolic syndrome (MS), and Type 2 Diabetes Mellitus (T2DM). It precedes nonphysiological increased blood glucose levels.³¹ IR is widely recognized as a shared factor contributing to the onset of conditions like diabetes mellitus (DM), cardiovascular disease (CVD) and metabolic syndrome (MS).

Acanthosis Nigricans is associated with insulin resistance.³² Consequently, physicians take an interest in exploring the connection between IR and AN for its early detection.³³ A notable correlation between AN and IR is observed in both normal-weight and obese children and adolescents.³³

Diabetes Mellitus and Acanthosis Nigricans

Prevalence of AN in DM is 36.11 %.³⁴

Insulin resistance is the predominant factor contributing to type 2 diabetes and is closely associated with obesity. This syndrome of insulin resistance is represented by a group of

cardiovascular risk factors including insulin resistance, dyslipidemia, hypertension, and visceral obesity.³⁵

Microvascular changes in Diabetes Mellitus and Insulin resistance

Diabetes mellitus is linked to microvascular complications such as retinopathy, nephropathy, and neuropathy. In recent observations, diabetic retinopathy has been noted in approximately 10% of individuals with insulin resistance (prediabetes).³⁶

Microvascular changes in Prediabetes, Insulin resistance states

Insulin resistance develops several years prior to the onset of diabetes mellitus, and the decline in β -cell function is evident even in prediabetic stages.

HOMA-IR (Homeostatic model assessment for insulin resistance) insulin sensitivity shows a sharp decline in the 5 years leading up to diagnosis of Diabetes mellitus.³⁷

Present evidence suggests that individuals with impaired glucose metabolism, whose blood sugar levels exceed optimal values but do not meet the diagnostic criteria for diabetes mellitus, still experience microvascular complications associated with diabetes.³⁸

The pathogenic mechanisms of microvascular complications in individuals with glucose metabolism disorders remains incompletely understood. Alongside genetic predispositions, several proposed mechanisms include hyperglycemia induced changes in the polyol, protein kinase C (PKC) pathways, hexosamine pathways. Other mechanisms such as generation of advanced glycation end products, initiation of transforming growth factor (TGF- β), and other detrimental growth factors like oxidative stress are also

responsible. Among these factors, hyperglycemia-related mechanisms have a particular significant impact on the development of these complications.³⁸

Evidence supporting the role of these toxic pathways has been demonstrated in experimental models and individuals with diabetes mellitus. However, clinical observations suggest that years of exposure to hyperglycemia leads to actual tissue damage further leading to complications. Therefore, it is an enigma why certain individuals with glycemia below the diagnostic threshold for diabetes mellitus are susceptible to the early development of complications typically observed in long-standing diabetes mellitus patients.³⁸

It is plausible that individuals may differ in their response to different levels of glycemia in relation to the thresholds that trigger these toxic pathways.³⁸

Another possibility is the synergistic effect, where the simultaneous activation of multiple mechanisms may render some individuals especially vulnerable to premature damage.³⁸

Mechanism of microvascular damage

Elevated insulin resistance results in heightened glucose levels in the bloodstream. Given that the vascular endothelium represents the innermost layer of the vessel, it is susceptible to damage under hyperglycemic conditions, indicating that dysfunctions like insulin resistance and T2DM may lead to vascular dysfunction. Studies have shown increased production of reactive oxygen species (ROS) in both large and small vessels in hyperglycemic animal models. Within a hyperglycemic milieu, various biological signalling pathways influence the increased ROS generation in endothelial cells. Elevated advanced glycation end-products boost receptor activity, promoting ROS and inflammatory cytokine production. Activation of the diacylglycerol–protein kinase C

Review of Literature

pathway also contributes to heightened ROS and inflammatory cytokine generation. Increased reactive oxygen species (ROS) due to oxidative stress in the vascular endothelium not only diminishes nitrogen oxide bioavailability but also augments the proinflammatory cytokines, thereby promoting abnormal prothrombotic processes. Consequently, insulin resistance is likely to impair the structural and functional integrity of the vascular endothelium.³⁹ Hypoxia to the tissue further leads to neoangiogenesis.

Nailfold capillaroscopy in Diabetes Mellitus Type 2

Assessing nailfold capillaroscopic findings can serve as one modality for vascular assessment in diabetic patients, aiding in the diagnosis and monitoring of microvascular complications over time.⁴⁰

In a study done by Ahmad S et al, following changes were observed as below : **Table 4: Nail fold Capillaroscopy changes in Diabetes Mellitus**

Sr No.	NFC Findings	Percentage
1	Tortuosity	46.1%
2	Neoangiogenesis (Bushy +Ramification +Bizarre)	35.4%
3	Microhaemorrhage/extravasation	28.6%
4	Mega capillaries/ectasia	28.2%
5	Avascular area	18.7%
6	Cross/meandering	30.9%

Correlation of Nail fold capillaroscopic changes and Diabetic retinopathy and diabetic nephropathy.

In diabetes, microangiopathy represents a prevalent and concerning complication, with alterations in cutaneous microvessels often presenting as the earliest signs of the disease. Notably, a significant correlation has been observed between abnormal NFC findings in diabetic individuals and indicators of poor glycemic control, as well as the severity of diabetic retinopathy and nephropathy. Consequently, NFC could serve as a valuable tool for predicting microangiopathic involvement in diabetes, potentially aiding in the prevention of impending complications.⁴¹

MATERIALS AND METHODOLOGY

✚ **Study source:** This study was conducted in the Department of Dermatology, Venereology and Leprosy, in tertiary care hospital, Belgaum as a part of the MD program academic curriculum.

✚ **Study duration:** The study was conducted in this duration -July 2022 to July 2023

✚ **Ethical clearance:** Clearance was taken from the Institutional Ethical committee.
(Reference No. – MDC/JNMCIEC/14)

✚ **CTRI Registration:** CTRI registration was done for the study as well.

CTRI number- CTRI/2023/06/054301

✚ **Study design:** Hospital based cross-sectional study.

✚ **Sample size:**

Formula used for sample size calculation is

$$n = \frac{p(100 - p)Z^2}{E^2}$$

N is the sample size required, p is the percentage occurrence of a state or condition (proportion or prevalence), E is the percentage maximum error required, Z is the value corresponding to level of confidence required.

Prevalence of crista cutis on dermoscopy observed in acanthosis nigricans assumed as 50%. With percentage of maximum error taken as 10% and at 95% confidence level sample size is given by,

$$n = \frac{50 \times (100 - 50) \times (1.96)^2}{(10)^2}$$

$$n = 96.04 \approx 96$$

‡ Sampling technique:

Purposive sampling

- A) All patients with clinically diagnosed cases of Acanthosis Nigricans attending KLE'S Dr Prabhakar Kore Hospital and Medical Research Centre, Belgaum who voluntarily gave consent were recruited.
- B) Informed consent was obtained from all the patients included in this study.
- C) Data was collected by one examiner and recorded in case record proforma.
- D) All patients in study underwent a detailed history taking, general physical like height, weight, BMI, systemic and dermatological examination. E) All participants underwent dermoscopic evaluation.
- F) All participants underwent nailfold capillaroscopy.
- G) Records were maintained and analyzed statistically and relevant pictures attached.

‡ Inclusion criteria

- 1) The study included all clinically diagnosed cases of acanthosis nigricans between the age group 5 years to 70 years.

‡ Exclusion criteria

- 1) Patients not willing / not consenting for investigations.
- 2) Patients having concomitant infection or other skin condition affecting the area of acanthosis nigricans.
- 3) Mehndi application over proximal nail folds.

- 4) Infection or inflammatory conditions involving the nail fold unit.
- 5) Patients having concomitant rheumatological conditions like Scleroderma ,Systemic Lupus Erythematosus,Dermatomyositis.
- 6) Fitzpatrick skin type VI.

‡ **Data collection:**

- 1) All clinically diagnosed patients of Acanthosis Nigricans who gave consent and fulfilled the inclusion criteria
 - The study included all cases of Acanthosis Nigricans (clinically diagnosed) between the age group 5 years to 70 years.¹
- 2) A questionnaire was given to the subject where detailed personal history, family history past history and drug history was asked and noted.
- 3) Anthropometric measurements like height, weight was done and noted.
- 4) Dermoscopy was done on affected sites using a universal serial bus (USB) digital microscope with a polarizing light (Dinolite) AF4115ZT using polarized and nonpolarized mode and images were taken.
- 5) Nail fold capillaroscopy was done on all ten fingers using the above mentioned model of dermoscope Images were captured and stored.
- 6) The dermoscopy findings were graded with the help of a scale made and validated by 2 expert dermatologists specialised in dermoscopy-

a. Dr Bhavana R Doshi

Professor and Head of the Department- Dermatology, Venereology and Leprosy.

KAHER's Jawaharlal Nehru Medical College, Belagavi, Karnataka, India.

b. Dr Bhalachandra Ankad

Professor – Department of Dermatology, Venereology and Leprosy.

S. Nijalingappa Medical College

Bagalkot, Karnataka, India.

7) The Nailfold capillaroscopy changes were also graded with help of a scale made and validated by 2 expert dermatologists specialised in dermoscopy-

a. Dr Bhavana R Doshi

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b. Dr Bhalachandra Ankad

Professor – Department of Dermatology, Venereology and Leprosy.

S. Nijalingappa Medical College & H.S.K. Hospital and Research centre, Bagalkot, Karnataka, India.

† Statistical Method for data analysis

- All the data was entered in excel sheet and analysed using SPSS v 21 operating on windows 10.
- Association between categorical variables was measured with Chi- square test.
- Association between categorical variable and one continuous variable was measured with ANOVA test.
- P-value less than or equal to 0.05 was considered to be of statistical significance.

RESULTS

A total of 97 patients participated in the study. In detail history and clinical examination followed by dermoscopy and nail fold capillaroscopy was done in patients and the data was collected and analysed.

Association between categorical variables was done using chi- square test.

Association between categorical variable and one continuous variable was done using ANOVA test. $P < 0.05$ considered significant.

Dermoscopy Scoring – Formulated and Validated by 2 experts in dermoscopy Table 5: Dermoscopy scoring for Acanthosis Nigricans

	Dermoscopy Changes	0	1	2
1.	Sulci Cutis	Absent	Prominent	Not Prominent
2.	Cristi Cutis	Absent	Rhomboid formation present	Rhomboid formation absent
3.	Papillary Projections	Absent	Non-triangular	Triangular
4.	Hyperpigmented dots/globules	Absent	<50	>50
5.	Colour of Hyperpigmented dots/globules	Absent	Dark brown	Light brown
6.	Hyperpigmented Blotches	Absent	Present	
7.	Crypts	Absent	Present	
8.	White streaks/globules	Absent	Present	

Nail Fold Capillaroscopy Scoring- Formulated and Validated by 2 experts in dermoscopy

Table 6: Nail fold capillaroscopy scoring for Nailfold capillaroscopy in Acanthosis Nigricans

	Nail fold capillaroscopy changes	0	1
1.	Drop outs	Absent	Present
2.	Tortuous capillaries	Absent	Present
3.	Cross-linked capillaries	Absent	Present
4.	Giant capillaries	Absent	Present
5.	Haemorrhage	Absent	Present
6.	Ramified capillaries	Absent	Present
7.	Ectasia	Absent	Present

Clinico-demographic data –

In the present study we observed that majority of the participants belonged to the age group 16 to 25 years. Females were 71.1 % and males 28.8 %. The female to male ratio in the current study is 2.73. 63.38 % females had irregular periods. Skin tags (50.51%) was the most common dermatological association observed. Maximum (51.54%) patients belonged to the pre-obese ($25.0 \text{ kg/m}^2 - 29.9 \text{ kg/m}^2$) category of BMI Asian classification.

Table 7: Clinicodemographic data

Age	N	PERCENTAGE
5- 15 years	9/97	(9.27%)
16-25 years	38/97	(39.17%)
26-35 years	17/97	(17.52%)
36 – 45 years	15/97	(15.46%)
46 – 55 years	12/97	(12.37%)
56- 65 years	5/97	(5.15%)
> 65 years	1/97	(1.03%)
Gender Distribution		
Males	26/97	(26.80%)
Females	71/97	(71.13%)
Duration of AN		
< 5 years	66/97	(68.04%)
≥ 5 years	31/97	(31.95%)
Periods	Females (71)	
Pre- menarche	1	1.40 %
Irregular	45	63.38%
Regular	21	29.57 %
Menopause	4	4.12%
Skin tags		
Absent	48	49.48%
<5	22	22.68%
>5	27	27.83%
Hirsutism (Females – 71)		

Absent	61	85.91 %
Present	11	15.49 %
MPHL/FPHL		
Absent	70	72.16%
Present	27	27.83%
Known case of Diabetes Mellitus		
Absent	90	92.78%
Present	7	7.21%
Known case of Hypertension		
Absent	93	95.87 %
Present	4	4.12 %
BMI Asian Classification		
Underweight <18.5 kg/m ²	0	0
Normal 18.5 – 22.9 kg/m ²	3	3.09%
Overweight 23.0 – 24.9 kg/m ²	3	3.09%
Obese I 25.0 – 29.9 kg/m ²	50	51.54%
Obese II ≥ 30 kg/m ²	42	43.29%
HOMA IR (> 2)	21	21.64%

RA – Right axilla

LA – Left axilla

YRS - Years Fitzpatrick skin type 4 was the commonest (66%) in the present study followed by skin type 3 (24.7%).

Sulci cutis was the commonest finding on dermoscopy followed by cristi cutis and papillary projections.

In 14/97 14.4 percent participants all 10 nailfolds were not visible.

Out of the visible nail folds the NFC findings seen in more than two fingers were considered significant.

Frequencies of variables

Frequency of Fitzpatrick skin type

The most common Fitzpatrick skin type seen was type 4, n=64, 66%(64/97) followed by type 3 n=24, 24.7% (24/97) followed by type 5 n=6, 6.2% (6/97). Least common skin type seen was type 2 n= 3, 3.1% (3/97).

Frequency of Burke's Grading – Neck severity

The most common Burke's grade in neck severity seen was grade 3, n=47, 48.5% (47/97) followed by grade 4 n=35, 36.1% (35/97) followed by grade 2 n=13, 13.4% (13/97). Least common grade was grade 1 n= 2, 2.1% (2/97).

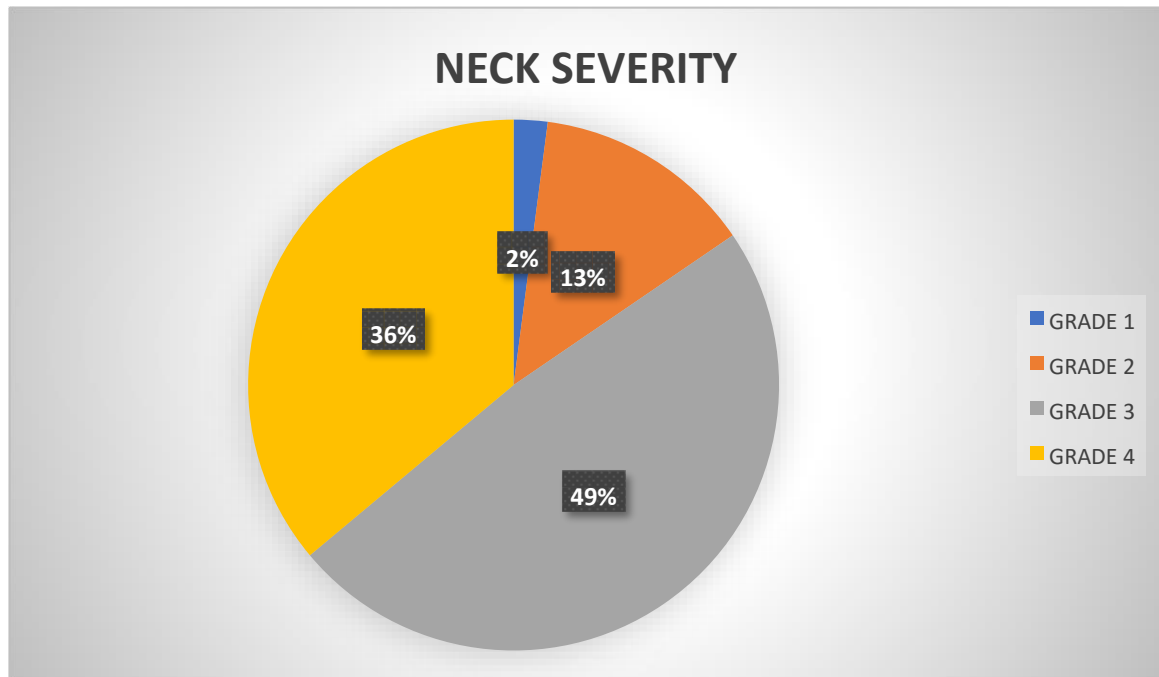


Figure 2: Frequencies of neck severity (Burke's clinical grade for AN)

Frequency of Burke's grading of Axilla

The most common Burke's grade in axilla seen was grade 3, $n=43$, 44.3% (43/97) followed by grade 4 $n=23$, 23.7% (23/97) followed by grade 2 and grade 1 $n=8$, 8.2% (8/97).

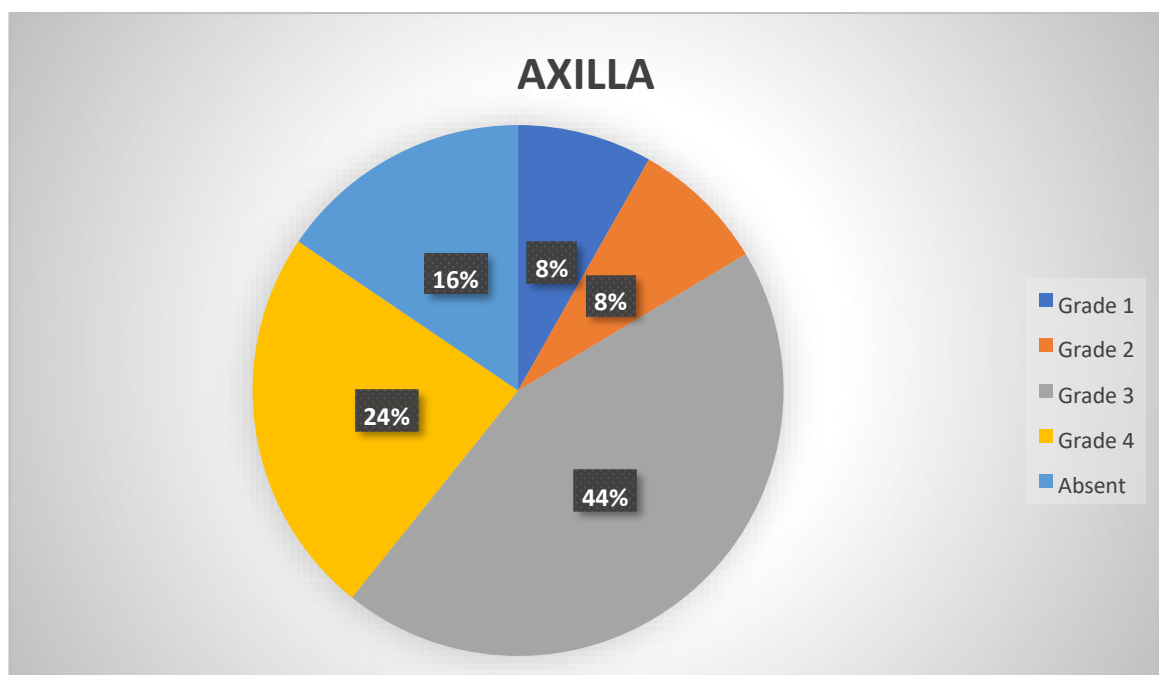


Figure 3: Frequencies of axilla (Burke's clinical grade for AN)

Frequency of Burke's grading – Neck Texture

The most common Burke's grade in neck texture seen was grade 3, n=58, 59.8% (58/97) followed by grade 2 n=27, 27.8% (27.8/97) followed by grade 1 n=12, 12.4% (12/97).

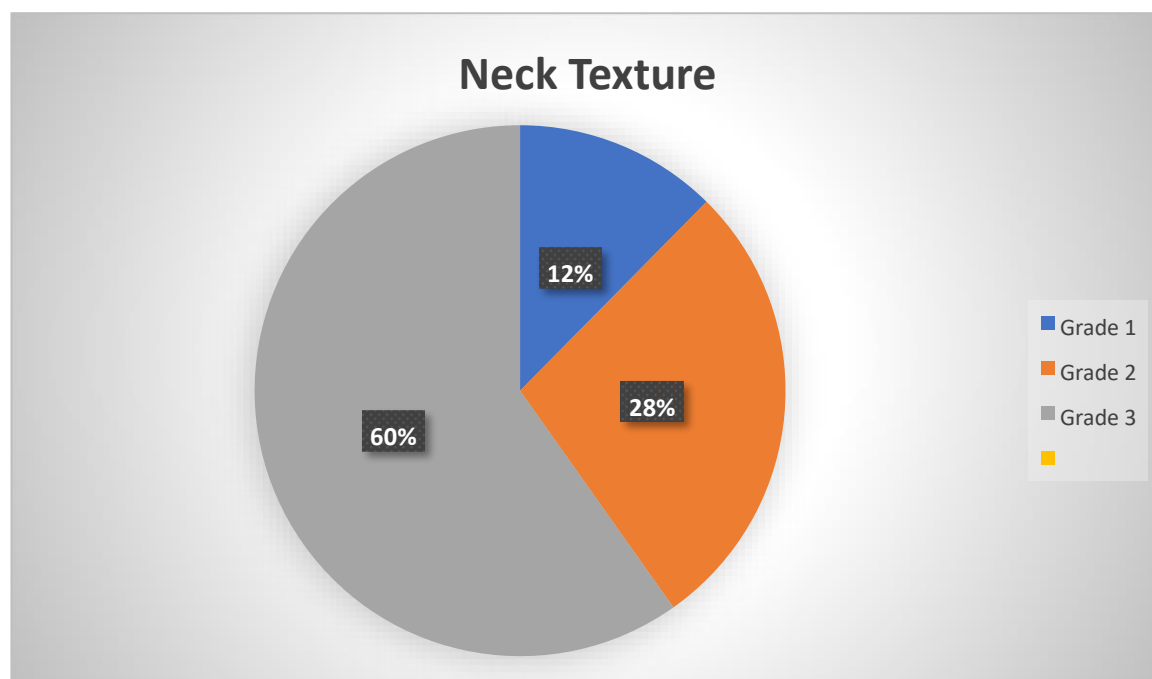


Figure 4: Frequencies of neck texture (Burke's clinical grade for AN)

DERMOSCOPY FINDINGS -FREQUENCY

○ Neck Dermoscopy

• Neck Dermoscopy – Sulci cutis

97/97 100% patients showed sulci cutis on neck dermoscopy. Out of those 17/97

17.95% had non- prominent sulci and 80/97 82.5% showed prominent sulci.

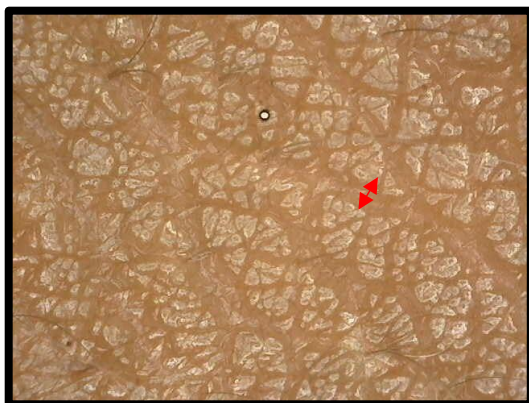


Figure 5a

Sulci cutis- Not prominent
(Non-polarised 80 X magnification)

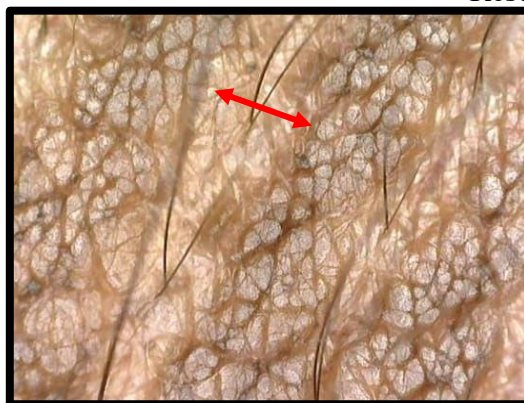


Figure 5b

Sulci cutis- Prominent
(Non-polarised 80 X magnification)

- **Neck Dermoscopy – Crista cutis**

95/97 97.93% patients showed crista cutis on neck dermoscopy. Out of those 32/97 32.98% did not have rhomboid formation and 63/97 64.9% showed rhomboid formation.

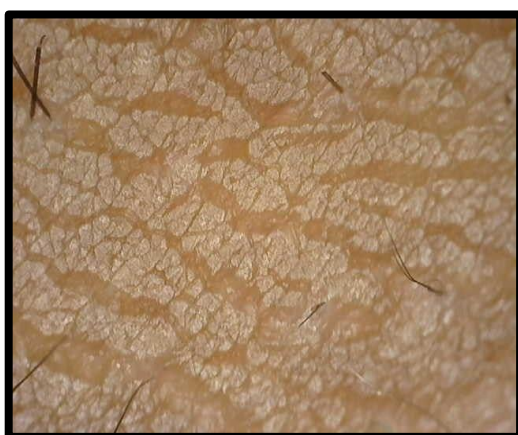


Figure 6a

Crista Cutis-Rhomboid formation absent
(Non-polarised mode, 80X magnification)

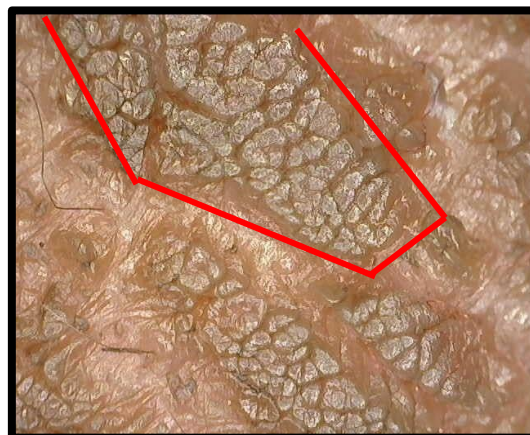


Figure 6b

Crista Cutis-Rhomboid formation present
(Non-polarised mode, 80X magnification)

- **Neck Dermoscopy – Papillary projections**

94/97 96.90% patients showed papillary projections on neck dermoscopy. Out of those 39/97 40.20% were triangular in shape and 55/97 56.70% were non triangular in shape.

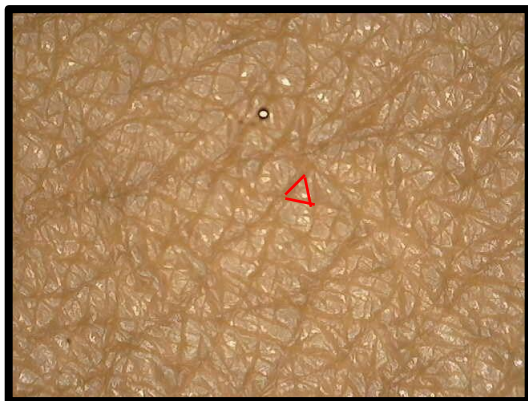


Figure 7a

Papillary projections-Triangular

(Non-polarised mode, 80X magnification)



Figure 7b

Papillary projections-Non-triangular

(Non - polarised mode, 80X magnification)

- **Neck Dermoscopy – Hyperpigmented dots/globules**

55/97 56.70% patients showed hyperpigmented dots/globules on neck dermoscopy. Out of those 31/97 31.95% had < 50 hyperpigmented dots 24/97 24.74% had >50 hyperpigmented dots/globules.



Figure 8a

<50

(Non-polarised mode 80X magnification)

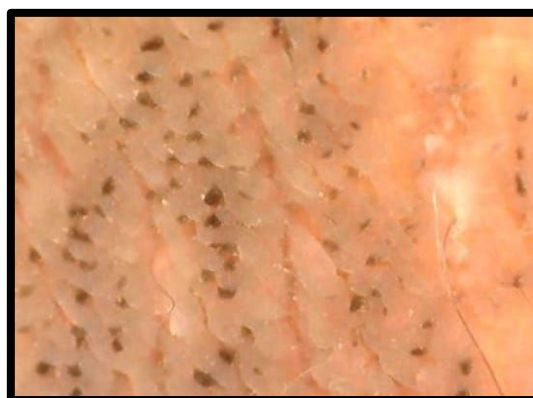


Figure 8b

> 50

(Polarised mode 80Xmagnification)

- **Neck Dermoscopy – Colour of hyperpigmented dots/globules**

23.71% had light brown hyperpigmented dots/globules. 30.92% had dark brown hyperpigmented dots/globules.



Figure 9a

Dark brown

(Polarised mode, 80X magnification)



Figure 9b

Light brown

(Non-polarised mode, 80X magnification)

Neck Dermoscopy – Hyperpigmented blotches

43/97 44.32% patients showed hyperpigmented blotches on neck dermoscopy.

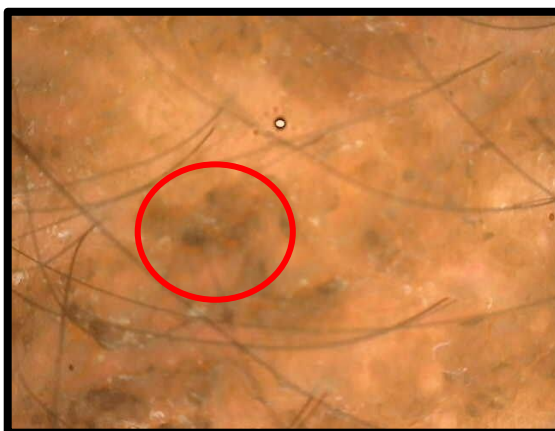


Figure 10

Hyperpigmented blotches (Polarised mode, 80X magnification)

- **Neck Dermoscopy – Crypts**

29/97 29.89% patients showed crypts on neck dermoscopy.



Figure 11

Crypts (Non-polarised mode, 80X magnification)

- **Neck Dermoscopy – White streaks/globules**

6/97 6.18% patients showed white streaks/globules on neck dermoscopy.



Figure 12

White streaks/globules (Polarised mode, 80X magnification)

○ Right axilla dermoscopy findings

• Right axilla dermoscopy – Sulci cutis

In 17/97 patients, 17.52% axillae were not involved. 78/80 97.5% patients showed sulci cutis on right axilla dermoscopy. Out of those 8/80 10% had non-prominent sulci cutis. 70/80 87.5% had prominent sulci cutis.

• Right axilla dermoscopy – Crista cutis

In 17/97 patients, 17.52% axillae were not involved. 63/80 78.75% patients showed crista cutis on right axilla dermoscopy. Out of those 23/80 28.75% did not show rhomboid formation. 40/80 50% showed rhomboid formation present.

• Right axilla dermoscopy – Papillary projections

In 17/97 17.52% patients, axillae were not involved. 68/80 85% patients showed papillary projections on right axilla dermoscopy. Out of those 13/80 16.25% showed triangular papillary projections. 55/80 68.75% showed non-triangular papillary projections.

• Right axilla dermoscopy – Hyperpigmented dots/globules

In 17/97 17.52% patients, axillae were not involved. 59/80 73.75% patients showed hyperpigmented dots/globules on right axilla dermoscopy. Out of those 15/80 18.75% showed <50 hyperpigmented dots globules. 44/80 55% showed >50 hyperpigmented dots/globules.

- **Right axilla dermoscopy – Colour of hyperpigmented dots/globules**

17.5% showed light brown colour. 53.75% showed dark brown colour in right axilla.

- **Right axilla dermoscopy – Hyperpigmented blotches**

In 17/97 17.52% patients, axillae were not involved. 33/80 41.25% patients showed hyperpigmented blotches on right axilla dermoscopy.

- **Right axilla dermoscopy – Crypts**

In 17/97 17.25% patients, axillae were not involved. 25/80 31.25% patients showed crypts on right axilla dermoscopy.

- **Right axilla dermoscopy – White streaks/globules**

In 17/97 17.25% patients, axillae were not involved. 11/80 13.75% patients showed white streaks/globules on right axilla dermoscopy.

○ **Left axilla dermoscopy**

- **Left axilla dermoscopy – Sulci cutis**

In 17/97 patients, 17.52% axillae were not involved. 78/80 97.5% patients showed sulci cutis on left axilla dermoscopy. Out of those 10/80 12.5% had non-prominent sulci cutis. 68/80 85% had prominent sulci cutis.

- **Left axilla dermoscopy – Crista Cutis**

In 17/97 patients, 17.52% axillae were not involved. 53/80 66.25% patients showed crista cutis on left axilla dermoscopy. Out of those 19/80 23.75% did not show rhomboid formation. 34/80 42.5% showed rhomboid formation present.

- **Left axilla dermoscopy – Papillary projections**

In 17/97 17.52% patients, axillae were not involved. 67/80 83.75% patients showed papillary projections on left axilla dermoscopy. Out of those 12/80 15% showed triangular papillary projections. 55/80 68.75% showed non-triangular papillary projections.

- **Left axilla dermoscopy – Hyperpigmented dots/globules**

In 17/97 17.52% patients, axillae were not involved. 59/80 73.75% patients showed hyperpigmented dots/globules on left axilla dermoscopy. Out of those 15/80 18.75% showed <50 hyperpigmented dots globules. 44/80 55% showed >50 hyperpigmented dots/globules.

- **Left axilla dermoscopy – Colour of hyperpigmented dots/globules**

17.5% showed light brown colour. 53.75% showed dark brown colour in left axilla.

- **Left axilla dermoscopy – Hyperpigmented blotches**

In 17/97 17.52% patients, axillae were not involved. 36/80 45% patients showed hyperpigmented blotches on left axilla dermoscopy.

- **Left axilla dermoscopy – Crypts**

In 17/97 17.52% patients, axillae were not involved. 26/80 32.5% patients showed crypts on left axilla dermoscopy.

- **Left axilla dermoscopy – White streaks/globules**

In 17/97 17.25% patients, axillae were not involved. 13/80 16.25% patients showed white streaks/globules on left axilla dermoscopy.

•
○ Nail fold capillaroscopy frequencies

Drop outs

Table 8: Frequency of dropouts

Number of nailfolds the finding is seen in		Frequency	Percent
Valid	0	0	0
	1	0	0
	2	0	0
	3	0	0
	4	2	2.1
	5	13	13.4
	6	25	25.8
	7	14	14.4
	8	21	21.6
	9	2	2.1
	10	6	6.2
	Total	83	85.6
Missing	System	14	14.4
Total		97	100.0

In 14/97 14.43% participants all ten nailfolds were not visible.

83/83 patients showed drop outs in ≥ 3 nailfolds.



Figure 13 – Drop outs

Tortuous capillaries**Table 9: Frequency of tortuous capillaries**

Number of nailfolds the finding is seen in		Frequency	Percent
Valid	1	9	9.3
	2	13	13.4
	3	2	2.1
	4	4	4.1
	5	22	22.7
	6	24	24.7
	7	2	2.1
	8	4	4.1
	9	3	3.1
	Total	83	85.6
Missing	System	14	14.4
Total		97	100.0

•
In 14/97 14.43% participants nailfolds were not visible.

61/83 73.49% patients showed tortuous capillaries in ≥ 3 nailfolds.



Figure 14 – Tortuous capillaries

Cross linked capillaries

Table 10: Frequency of crosslinked capillaries

Number of nailfolds the finding is seen in		Frequency	Percent
Valid	0	11	11.3
	1	2	2.1
	2	15	15.5
	3	11	11.3
	4	22	22.7
	5	8	8.2

	6	12	12.4
	8	2	2.1
	Total	83	85.6
Missing	System	14	14.4
Total		97	100.0

In 14/97 14.43% participants nailfolds were not visible.

55/83 66.26% patients showed tortuous capillaries in ≥ 3 nailfolds.



Figure 15- Crosslinked capillaries

- **Giant capillaries**

Table 11: Frequency of giant capillaries

Number of nailfolds the finding is seen in		Frequency	Percent
Valid	0	58	59.8
	1	8	8.2
	2	10	10.3
	3	5	5.2
	4	2	2.1
	Total	83	85.6
Missing	System	14	14.4
Total		97	100.0

In 14/97 14.43% participants nailfolds were not visible.

7/83 8.4% patients showed giant capillaries in ≥ 3 nailfolds.



Figure 16 – Giant capillaries

- **Haemorrhage**

Table 12: Frequency of haemorrhage

Number of nailfolds the finding is seen in		Frequency	Percent
Valid	0	77	79.4
	1	6	6.2
	Total	83	85.6
Missing	System	14	14.4
Total		97	100.0

In 14/97 14.43% participants nailfolds were not visible.

6/83 7.22% patients showed haemorrhage in ≥ 3 nailfolds.

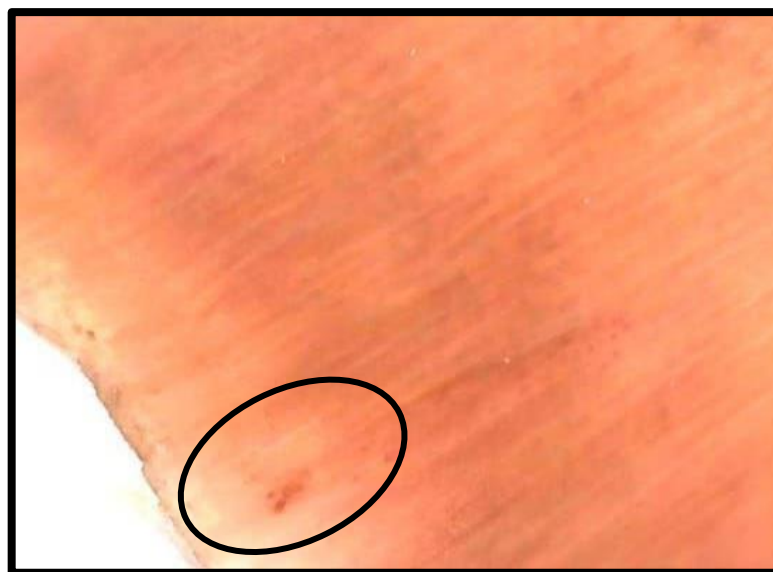


Figure 17 - Haemorrhage

- **Ramified capillaries**

Table 13: Frequency of ramified capillaries

Number of nailfolds the finding is seen in		Frequency	Percent
Valid	0	45	46.4
	1	7	7.2
	2	5	5.2
	3	14	14.4
	5	6	6.2
	6	4	4.1
	7	2	2.1
	Total	83	85.6
Missing	System	14	14.4
Total		97	100.0

In 14/97 14.43% participants nailfolds were not visible.

26/83 31.3% patients showed ramified capillaries in ≥ 3 nailfolds.



Figure 18 – Ramified capillary

- **Ectasia**

Table 14: Frequency of ectasia

Number of nailfolds the finding is seen in		Frequency	Percent
Valid	0	77	79.4
	1	4	4.1
	2	2	2.1
	Total	83	85.6
Missing	System	14	14.4
Total		97	100.0

In 14/97 14.43% participants nailfolds were not visible.

0/83 0 % patients showed ectasia in ≥ 3 nailfolds.



Figure 19 - Ectasia

Association of Clinical scale (Burke's grading) with Dermoscopic findings (scoring system) was done using Chi Square test.

Table 15: Association of neck severity (Burke's grading) with Neck sulci cutis

1 - Prominent

2 - Not prominent

0 - Absent

Crosstab					Results
			N SULC		
				2	Total
NECK SEVERITY	1	Count	0	2	2
		% within NECK SEVERITY	0.0%	100.0%	100.0%
	2	Count	4	9	13
		% within NECK SEVERITY	30.8%	69.2%	100.0%
	3	Count	41	6	47
		% within NECK SEVERITY	87.2%	12.8%	100.0%
	4	Count	35	0	35
		% within NECK SEVERITY	100.0%	0.0%	100.0%
Total	Count	80	17	97	
	% within NECK SEVERITY	82.5%	17.5%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the Neck severity (Burke's grade) and grade of sulci cutis. As clinical grade increased sulci became prominent.

Table 16: Association of neck severity (Burke's grading) with Neck cristi cutis

1 - Rhomboid formation present

2 - Rhomboid formation absent

0 - Absent

Crosstab

		N CRISTI CU IS			Total
		0	1	2	
NECK SEVERITY	1	Count	0	0	2
		% within NECK SEVERITY	0.0%	0.0%	100.0%
	2	Count	0	0	13
		% within NECK SEVERITY	0.0%	0.0%	100.0%
	3	Count	2	31	47
		% within NECK SEVERITY	4.3%	65.7%	100.0%

Results						
	4	% within NECK SEVERITY	4.3%	66.0%	29.8%	100.0%
		Count	0	32	3	35
		% within NECK SEVERITY	0.0%	91.4%	8.6%	100.0%
Total		Count	2	63	32	97
		% within NECK SEVERITY	2.1%	64.9%	33.0%	100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the Neck severity (Burke's grade) and grade of cristi cutis. As clinical grade increased rhomboid formation was seen.

Table 17: Association of neck severity (Burke's grading) with neck papillary projection

1 -Non- triangular

2 - Triangular

0 - Absent

		Crosstab			
		PAPILLARY PROJECTIONS			
		0	2	Total	
NECK SEVERITY	1	Count	0	0	2
		% within NECK SEVERITY	0.0%	0.0%	100.0%
	2	Count	0	0	13
		% within NECK SEVERITY	0.0%	0.0%	100.0%
	3	Count	3	23	21
		% within NECK SEVERITY	6.4%	48.9%	44.7%
	4	Count	0	32	3
		% within NECK SEVERITY	0.0%	91.4%	8.6%
Total		Count	3	55	39
		% within NECK SEVERITY	3.1%	56.7%	40.2%
					100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the Neck severity (Burke's grade) and shape of papillary projections. As clinical grade increased papillary projections became non-triangular.

Table 18: Association of neck severity (Burke's grading) with neck hyperpigmented dots

1 - <50

2 - >50

0 - Absent

Crosstab

			N HYPERPIGMENTED DOTS/GLOBULES 1 or 2			Total
			0	1	2	
NECK SEVERITY	1	Count	2	0	0	2
		% within NECK SEVERITY	100.0%	0.0%	0.0%	100.0%
	2	Count	5	8	0	13
		% within NECK SEVERITY	38.5%	61.5%	0.0%	100.0%
	3	Count	22	12	13	47
		% within NECK SEVERITY	46.8%	25.5%	27.7%	100.0%
	4	Count	13	11	11	35
		% within NECK SEVERITY	37.1%	31.4%	31.4%	100.0%
	Total	Count	42	31	24	97
		% within NECK SEVERITY	43.3%	32.0%	24.7%	100.0%

As p value is 0.079(>0.05) according to chi square test, there is no significant association between the Neck severity (Burke's grade) and number of hyperpigmented dots.

Table 19: Association of neck severity (Burke's grading) with neck colour of hyperpigmented dots 1 - Dark brown

2 - Light brown

0 - Absent

Crosstab						Results
			N COLOUR OF HYPERPIGMENTED DOTS			Total
			0	1	2	
NECK SEVERITY	1	Count	2	0	0	2
		% within NECK SEVERITY	100.0%	0.0%	0.0%	100.0%
	2	Count	5	4	4	13
		% within NECK SEVERITY	38.5%	30.8%	30.8%	100.0%
	3	Count	22	10	15	47
		% within NECK SEVERITY	46.8%	21.3%	31.9%	100.0%
	4	Count	15	16	4	35
		% within NECK SEVERITY	42.9%	45.7%	11.4%	100.0%
Total	Count	44	30	23	97	
	% within NECK SEVERITY	45.4%	30.9%	23.7%	100.0%	

As p value is 0.111 (>0.05) according to chi square test, there is no significant association between the Neck severity (Burke's grade) and colour of hyperpigmented dots.

Table 20: Association of neck severity (Burke's grading) with neck hyperpigmented blotches 1- Present

0 - Absent

Crosstab					
			N HYPERPIGMENTED BLOTCHES		Total
			0	1	
NECK SEVERITY	1	Count	2	0	2
		% within NECK SEVERITY	100.0%	0.0%	100.0%
	2	Count	11	2	13
		% within NECK SEVERITY	84.6%	15.4%	100.0%
	3	Count	27	20	47
		% within NECK SEVERITY	57.4%	42.6%	100.0%
	4	Count	14	21	35
		% within NECK SEVERITY	40.0%	60.0%	100.0%

				Results
	% within NECK SEVERITY	40.0%	60.0%	100.0%
Total	Count	54	43	97
	% within NECK SEVERITY	55.7%	44.3%	100.0%

As p value is 0.023 (<0.05) according to chi square test, there is a significant association between the Neck severity (Burke's grade) and presence of hyperpigmented blotches. As clinical grade increased presence of hyperpigmented blotches increased.

Table 21: Association of neck severity (Burke's grading) with neck crypts

1- Present

0 - Absent

Crosstab					
			N CRY.		
			0	1	Total
NECK SEVERITY	1	Count	2	0	2
		% within NECK SEVERITY	100.0%	0.0%	100.0%
	2	Count	13	0	13
		% within NECK SEVERITY	100.0%	0.0%	100.0%
	3	Count	36	11	47
		% within NECK SEVERITY	76.6%	23.4%	100.0%
	4	Count	17	18	35
		% within NECK SEVERITY	48.6%	51.4%	100.0%
Total		Count	68	29	97
		% within NECK SEVERITY	70.1%	29.9%	100.0%

As p value is 0.002 (<0.05) according to chi square test, there is a significant association between the Neck severity (Burke's grade) and presence of crypts. As clinical grade increased presence of crypts.

Table 22: Association of neck severity (Burke's grading) with neck white streaks/globules

1- Present

0 - Absent

Crosstab					
			N WHITE STREAKS/Globules		
			0	1	Total
NECK SEVERITY	1	Count	2	0	2
		% within NECK SEVERITY	100.0%	0.0%	100.0%
	2	Count	13	0	13
		% within NECK SEVERITY	100.0%	0.0%	100.0%
	3	Count	45	2	47
		% within NECK SEVERITY	95.7%	4.3%	100.0%
	4	Count	31	4	35
		% within NECK SEVERITY	88.6%	11.4%	100.0%
Total	Count	91	6	97	
	% within NECK SEVERITY	93.8%	6.2%	100.0%	

As p value is 0.40 (>0.05) according to chi square test, there is a significant association between the Neck severity (Burke's grade) and presence white streaks/globules.

Table 23: Association of neck texture (Burke's grading) with neck sulci cutis

1 - Prominent

2 - Not prominent

0 - Absent

Crosstab

			N SULC		Total
			1	2	
NECK TEXTURE	1	Count	5	7	12
		% within NECK TEXTURE	41.7%	58.3%	100.0%
	2	Count	17	10	27
		% within NECK TEXTURE	63.0%	37.0%	100.0%
	3	Count	58	0	58
		% within NECK TEXTURE	100.0%	0.0%	100.0%
Total	Count		80	17	97
	% within NECK TEXTURE		82.5%	17.5%	100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the Neck texture (Burke's grade) and grade of sulci cutis. As clinical grade increased rhomboid formation was seen.

Table 24: Association of neck texture (Burke's grading) with neck cristi cuti

1 - Rhomboid formation present

2 - Rhomboid formation absent

0 - Absent

Crosstab

			N CRISTI CU IS			Total
			0	1	2	
NECK TEXTURE	1	Count	0	0	12	12

					Results
	2	% within NECK TEXTURE	0.0%	0.0%	100.0%
		Count	0	10	17
	3	% within NECK TEXTURE	0.0%	37.0%	63.0%
		Count	2	53	3
		% within NECK TEXTURE	3.4%	91.4%	5.2%
	Total	Count	2	63	32
% within NECK TEXTURE		2.1%	64.9%	33.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the Neck severity (Burke's grade) and grade of cristi cutis. As clinical grade increased rhomboid formation was seen more.

Table 25: Association of neck texture (Burke's grading) with neck papillary projections

1 -Non- triangular

2 - Triangular

0 - Absent

Crosstab						
			LARY PROJE			
			0	1	2	Total
NECK TEXTURE	1	Count	0	0	12	12
		% within NECK TEXTURE	0.0%	0.0%	100.0%	100.0%
	2	Count	3	6	18	27
		% within NECK TEXTURE	11.1%	22.2%	66.7%	100.0%
	3	Count	0	49	9	58
		% within NECK TEXTURE	0.0%	84.5%	15.5%	100.0%
Total		Count	3	55	39	97
		% within NECK TEXTURE	3.1%	56.7%	40.2%	100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the Neck texture (Burke's grade) and grade of papillary projection. As clinical grade increased papillary projections became non-triangular.

Table 26: Association of neck texture (Burke's grading) with neck hyperpigmented dots/ globules

1 - <50

2 - >50

0 - Absent

Crosstab

			N HYPERPIGMENTED DOTS/GLOBULES 1 or 2			Total
			0	1	2	
NECK TEXTURE	1	Count	8	4	0	12
		% within NECK TEXTURE	66.7%	33.3%	0.0%	100.0%
	2	Count	14	10	3	27
		% within NECK TEXTURE	51.9%	37.0%	11.1%	100.0%
	3	Count	20	17	21	58
		% within NECK TEXTURE	34.5%	29.3%	36.2%	100.0%
Total		Count	42	31	24	97
		% within NECK TEXTURE	43.3%	32.0%	24.7%	100.0%

As p value is 0.02(<0.05) according to chi square test, there is a significant association between the Neck texture (Burke's grade) and number of hyperpigmented dots. As clinical grade increased number of hyperpigmented dots increased .

Table 27: Association of neck texture (Burke's grading) with neck colour of hyperpigmented dots/ globules

1 - Dark brown

2 - Light brown

0 - Absent

Crosstab

			N COLOUR OF PERPIGMENT DOTS			Total
			0	1	2	
NECK TEXTURE	1	Count	8	2	2	12
		% within NECK TEXTURE	66.7%	16.7%	16.7%	100.0%
	2	Count	14	2	11	27
		% within NECK TEXTURE	51.9%	7.4%	40.7%	100.0%
	3	Count	22	26	10	58
		% within NECK TEXTURE	37.9%	44.8%	17.2%	100.0%
Total		Count	44	30	23	97
		% within NECK TEXTURE	45.4%	30.9%	23.7%	100.0%

As p value is 0.003(<0.05) according to chi square test, there is a significant association between the Neck texture (Burke's grade) and colour of hyperpigmented dots. As clinical grade increased colour of hyperpigmented dots became darker.

Table 28: Association of neck texture (Burke's grading) with neck hyperpigmented blotches

1- Present

0 - Absent

Crosstab

			N HYPERPIGMENTED BLOTCHES		Total
			0	1	
NECK TEXTURE	1	Count	12	0	12

				Results	
		% within NECK TEXTURE	100.0%	0.0%	100.0%
	2	Count	25	2	27
		% within NECK TEXTURE	92.6%	7.4%	100.0%
	3	Count	17	41	58
		% within NECK TEXTURE	29.3%	70.7%	100.0%
	Total	Count	54	43	97
		% within NECK TEXTURE	55.7%	44.3%	100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the Neck texture (Burke's grade) and hyperpigmented blotches. As clinical grade increased presence of hyperpigmented blotches increased.

Table 29: Association of neck texture (Burke's grading) with neck crypts

1- Present

0 - Absent

			Crosstab		
			N CRYI		
			0	1	Total
NECK TEXTURE	1	Count	12	0	12
		% within NECK TEXTURE	100.0%	0.0%	100.0%
	2	Count	27	0	27
		% within NECK TEXTURE	100.0%	0.0%	100.0%
	3	Count	29	29	58
		% within NECK TEXTURE	50.0%	50.0%	100.0%
Total	Count		68	29	97
	% within NECK TEXTURE		70.1%	29.9%	100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the Neck texture (Burke's grade) and crypts. As clinical grade increased presence of crypts increased.

Table 30: Association of neck texture (Burke's grading) with neck white streaks/globules

1- Present

0 - Absent

Crosstab					
			N WHITE STREAKS/GLOBULES		
			0	1	Total
NECK TEXTURE	1	Count	12	0	12
		% within NECK TEXTURE	100.0%	0.0%	100.0%
	2	Count	23	4	27
		% within NECK TEXTURE	85.2%	14.8%	100.0%
	3	Count	56	2	58
		% within NECK TEXTURE	96.6%	3.4%	100.0%
Total	Count	91	6	97	
	% within NECK TEXTURE	93.8%	6.2%	100.0%	

As p value is 0.082(>0.05) according to chi square test, there is no significant association between the Neck texture (Burke's grade) and crypts.

Table 31: Association of right axilla (Burke's grading) with axilla sulci cutis

1 - Prominent

2 - Not prominent

0 - Absent

Crosstab			RA SULCI CUT S			Total
			0	1	2	
AXILLA	1	Count	0	6	0	6
		% within AXILLA	0.0%	100.0%	0.0%	100.0%
	2	Count	2	0	6	8
		% within AXILLA	25.0%	0.0%	75.0%	100.0%
	3	Count	0	41	2	43
		% within AXILLA	0.0%	95.3%	4.7%	100.0%
	4	Count	0	23	0	23
		% within AXILLA	0.0%	100.0%	0.0%	100.0%
Total	Count		2	70	8	80
	% within AXILLA		2.5%	87.5%	10.0%	100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the axilla (Burke's grade) and sulci cutis. As clinical grade increased presence of crypts increased.

Table 32: Association of right axilla (Burke's grading) with axilla cristi cutis

1 - Rhomboid formation present

2 - Rhomboid formation absent

0 - Absent

Crosstab			RA CRISTI CUTIS			Total
			0	1	2	
AXILLA	1	Count	0	3	3	6
		% within AXILLA	0.0%	50.0%	50.0%	100.0%
	2	Count	6	0	2	8
		% within AXILLA	75.0%	0.0%	25.0%	100.0%

						Results
3	Count	9	20	14	43	
	% within AXILLA	20.9%	46.5%	32.6%	100.0%	
4	Count	2	17	4	23	
	% within AXILLA	8.7%	73.9%	17.4%	100.0%	
Total	Count	17	40	23	80	
	% within AXILLA	21.3%	50.0%	28.7%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the right axilla (Burke's grade) and cristi cutis. As clinical grade increased presence of rhomboid formation increased.

Table 33: Association of right axilla (Burke's grading) with axilla papillary projections

1 -Non- triangular

2 - Triangular

0 - Absent

Crosstab						
		RA PAPIL	CTIONS			
			1	2		Total
AXILLA	1	Count	0	3	3	6
		% within AXILLA	0.0%	50.0%	50.0%	100.0%
	2	Count	4	2	2	8
		% within AXILLA	50.0%	25.0%	25.0%	100.0%
	3	Count	8	27	8	43
		% within AXILLA	18.6%	62.8%	18.6%	100.0%
	4	Count	0	23	0	23
		% within AXILLA	0.0%	100.0%	0.0%	100.0%
Total	Count	12	55	13	80	
	% within AXILLA	15.0%	68.8%	16.3%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the right axilla (Burke's grade) and papillary projection. As clinical grade increased papillary projections became non-triangular.

Table 34: Association of right axilla (Burke's grading) with axilla hyperpigmented dots/globules

1 - <50

2 - >50

0 - Absent

		Crosstab				Total
		RA		IGMENTED LOBULES		
		0	1	2		
AXILLA	1	Count	0	3	3	6
		% within AXILLA	0.0%	50.0%	50.0%	100.0%
	2	Count	8	0	0	8
		% within AXILLA	100.0%	0.0%	0.0%	100.0%
	3	Count	11	12	20	43
		% within AXILLA	25.6%	27.9%	46.5%	100.0%
	4	Count	2	0	21	23
		% within AXILLA	8.7%	0.0%	91.3%	100.0%
Total	Count	21	15	44	80	
	% within AXILLA	26.3%	18.8%	55.0%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the right axilla (Burke's grade) and number of hyperpigmented dots/globules. As clinical grade increased number of hyperpigmented dots increased.

Table 35: Association of right axilla (Burke's grading) with axilla colour of hyperpigmented dots/globules.

1 - Dark brown

2 - Light brown

0 - Absent

Crosstab						
		COLOUR OF HYPERPIGMENTED DOTS				Total
		0	1	2		
AXILLA	1	Count	0	0	6	6
		% within AXILLA	0.0%	0.0%	100.0%	100.0%
	2	Count	8	0	0	8
		% within AXILLA	100.0%	0.0%	0.0%	100.0%
	3	Count	11	26	6	43
		% within AXILLA	25.6%	60.5%	14.0%	100.0%
	4	Count	4	17	2	23
		% within AXILLA	17.4%	73.9%	8.7%	100.0%
Total	Count	23	43	14	80	
	% within AXILLA	28.7%	53.8%	17.5%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the right axilla (Burke's grade) and colour of hyperpigmented dots/globules. As clinical grade increased colour of hyperpigmented dots became darker.

Table 36: Association of right axilla (Burke's grading) with hyperpigmented blotches. 1- Present

0 - Absent

			Crosstab		
			RA HYPERPIGMENTED BLOTCHES		
			0	1	Total
AXILLA	1	Count	6	0	6
		% within AXILLA	100.0%	0.0%	100.0%
	2	Count	8	0	8
		% within AXILLA	100.0%	0.0%	100.0%
	3	Count	26	17	43
		% within AXILLA			

Results					
	4	% within AXILLA	60.5%	39.5%	100.0%
		Count	7	16	23
		% within AXILLA	30.4%	69.6%	100.0%
Total		Count	47	33	80
		% within AXILLA	58.8%	41.3%	100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the right axilla (Burke's grade) and hyperpigmented blotches. As clinical grade increased presence of hyperpigmented blotches increased.

Table 37: Association of right axilla (Burke's grading) with crypts.

1- Present

0 - Absent

Crosstab					
		RA CR			
			0	1	Total
AXILLA	1	Count	6	0	6
		% within AXILLA	100.0%	0.0%	100.0%
	2	Count	8	0	8
		% within AXILLA	100.0%	0.0%	100.0%
	3	Count	35	8	43
		% within AXILLA	81.4%	18.6%	100.0%
	4	Count	6	17	23
		% within AXILLA	26.1%	73.9%	100.0%
Total	Count	55	25	80	
	% within AXILLA	68.8%	31.3%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the right axilla (Burke's grade) and crypts. As clinical grade increased presence of crypts increased.

Table 38: Association of right axilla (Burke's grading) with white streaks/globules.

1- Present

0 - Absent

Crosstab

			RA WHITE STREAKS/GLOBULES		
			0	1	Total
AXILLA	1	Count	6	0	6
		% within AXILLA	100.0%	0.0%	100.0%
	2	Count	8	0	8
		% within AXILLA	100.0%	0.0%	100.0%
	3	Count	43	0	43
		% within AXILLA	100.0%	0.0%	100.0%
	4	Count	12	11	23
		% within AXILLA	52.2%	47.8%	100.0%
Total	Count	69	11	80	
	% within AXILLA	86.3%	13.8%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the right axilla (Burke's grade) and white streaks/globules . As clinical grade increased presence of white streaks/globules increased.

Table 39: Association of left axilla (Burke's grading) with sulci cutis.

1 - Prominent

2 - Not prominent

0 - Absent

Crosstab

			A SULCI CUTIS			Total
			0	1	2	
AXILLA	1	Count	0	6	0	6

					Results	
		% within AXILLA	0.0%	100.0%	0.0%	100.0%
	2	Count	2	0	6	8
		% within AXILLA	25.0%	0.0%	75.0%	100.0%
	3	Count	0	39	4	43
		% within AXILLA	0.0%	90.7%	9.3%	100.0%
	4	Count	0	23	0	23
% within AXILLA		0.0%	100.0%	0.0%	100.0%	
Total	Count	2	68	10	80	
	% within AXILLA	2.5%	85.0%	12.5%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the left axilla (Burke's grade) and sulci cutis. As clinical grade increased sulci became more prominent.

Table 40: Association of left axilla (Burke's grading) with cristi cutis.

1 - Rhomboid formation present

2 - Rhomboid formation absent

0 - Absent

			Crosstab			
			LA CRISTI CUTIS			Total
			0	1	2	
AXILLA	1	Count	0	3	3	6
		% within AXILLA	0.0%	50.0%	50.0%	100.0%
	2	Count	6	0	2	8
		% within AXILLA	75.0%	0.0%	25.0%	100.0%
	3	Count	11	18	14	43
		% within AXILLA	25.6%	41.9%	32.6%	100.0%
4	Count		10	13	0	23

					Results
	% within AXILLA	43.5%	56.5%	0.0%	100.0%
Total	Count	27	34	19	80
	% within AXILLA	33.8%	42.5%	23.8%	100.0%

As p value is 0.002(<0.05) according to chi square test, there is a significant association between the left axilla (Burke's grade) and cristi cutis. As clinical grade increase presence of rhomboid formation increased.

Table 41: Association of left axilla (Burke's grading) with papillary projection.

1 -Non- triangular

2 - Triangular

0 - Absent

Crosstab						
			LLARY PROJEC			
			0	1	2	Total
AXILLA	1	Count	0	3	3	6
		% within AXILLA	0.0%	50.0%	50.0%	100.0%
	2	Count	4	2	2	8
		% within AXILLA	50.0%	25.0%	25.0%	100.0%
	3	Count	7	29	7	43
		% within AXILLA	16.3%	67.4%	16.3%	100.0%
	4	Count	2	21	0	23
		% within AXILLA	8.7%	91.3%	0.0%	100.0%
Total	Count	13	55	12	80	
	% within AXILLA	16.3%	68.8%	15.0%	100.0%	

As p value is 0.002(<0.05) according to chi square test, there is a significant association between the left axilla (Burke's grade) and papillary projection. As clinical grade increased papillary projections became non-triangular.

Table 42: Association of left axilla (Burke's grading) with number of hyperpigmented dots/globules

1 - <50

2 - >50

0 - Absent

Crosstab						
			IGMENTED DOTS/			
			0	1	2	Total
AXILLA	1	Count	0	3	3	6
		% within AXILLA	0.0%	50.0%	50.0%	100.0%
	2	Count	8	0	0	8
		% within AXILLA	100.0%	0.0%	0.0%	100.0%
	3	Count	11	10	22	43
		% within AXILLA	25.6%	23.3%	51.2%	100.0%
	4	Count	2	2	19	23
		% within AXILLA	8.7%	8.7%	82.6%	100.0%
Total	Count	21	15	44	80	
	% within AXILLA	26.3%	18.8%	55.0%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the left axilla (Burke's grade) and hyperpigmented dots/globules. As clinical grade increased number of hyperpigmented dots/globules increased.

Table 43: Association of left axilla (Burke's grading) with colour of hyperpigmented dots/globules

1 - Dark brown

2 - Light brown

0 - Absent

				Results		
Crosstab				OF HYPERPIGME		
			0	1	2	Total
AXILLA	1	Count	0	0	6	6
		% within AXILLA	0.0%	0.0%	100.0%	100.0%
	2	Count	8	0	0	8
		% within AXILLA	100.0%	0.0%	0.0%	100.0%
	3	Count	11	28	4	43
		% within AXILLA	25.6%	65.1%	9.3%	100.0%
	4	Count	4	17	2	23
		% within AXILLA	17.4%	73.9%	8.7%	100.0%
Total		Count	23	45	12	80
		% within AXILLA	28.7%	56.3%	15.0%	100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the left axilla (Burke's grade) and colour of hyperpigmented dots/globules. As clinical grade increased colour of hyperpigmented dots/globules became darker.

Table 44: Association of left axilla (Burke's grading) with hyperpigmented blotches

1- Present

0 - Absent

Crosstab				LA HYPERPIGMENTED BLOTCHES		
				0	1	Total
AXILLA	1	Count		6	0	6
		% within AXILLA		100.0%	0.0%	100.0%
	2	Count		8	0	8
		% within AXILLA		100.0%	0.0%	100.0%
	3	Count		26	17	43
		% within AXILLA				

					Results
	4	% within AXILLA	60.5%	39.5%	100.0%
		Count	4	19	23
Total		% within AXILLA	17.4%	82.6%	100.0%
		Count	44	36	80
		% within AXILLA	55.0%	45.0%	100.0%
		Count			

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the left axilla (Burke's grade) and hyperpigmented blotched. As clinical grade increased presence of hyperpigmented blotches increased.

Table 45: Association of left axilla (Burke's grading) with crypts

1- Present

0 - Absent

Crosstab					
			LA CRY		
			0	1	Total
AXILLA	1	Count	6	0	6
		% within AXILLA	100.0%	0.0%	100.0%
	2	Count	8	0	8
		% within AXILLA	100.0%	0.0%	100.0%
	3	Count	34	9	43
		% within AXILLA	79.1%	20.9%	100.0%
	4	Count	6	17	23
		% within AXILLA	26.1%	73.9%	100.0%
Total	Count	54	26	80	
	% within AXILLA	67.5%	32.5%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the left axilla (Burke's grade) and crypts. As clinical grade increased presence of crypts increased.

Table 46: Association of left axilla (Burke's grading) with white globules/streaks

1- Present

0 - Absent

Crosstab					
LA WHITE STREAKS AND GLOBULES					
			0	1	Total
AXILLA	1	Count	6	0	6
		% within AXILLA	100.0%	0.0%	100.0%
	2	Count	8	0	8
		% within AXILLA	100.0%	0.0%	100.0%
	3	Count	41	2	43
		% within AXILLA	95.3%	4.7%	100.0%
	4	Count	12	11	23
		% within AXILLA	52.2%	47.8%	100.0%
Total	Count	67	13	80	
	% within AXILLA	83.8%	16.3%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the left axilla (Burke's grade) and white streaks/globules. As clinical grade increased presence of white streaks/globules.

Table 47: Summary of Clinical Vs Dermoscopy findings

	NECK SEVERITY	NECK TEXTURE	RIGHT AXILLA	LEFT AXILLA
Dermoscopy Findings				

Results				
SULCI CUTIS	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
CRISTI CUTIS	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
PAPILLARY PROJECTION	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
HYPERPIGMENTED DOTS AND GLOBULES	NOT SIGNIFICANT	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
COLOUR OF HYPERPIGMENTED DOTS	NOT SIGNIFICANT	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
HYPERPIGMENTED BLOTCHES	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
CRYPTS	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
WHITE STREAKS AND GLOBULES	NOT SIGNIFICANT	NOT SIGNIFICANT	SIGNIFICANT	SIGNIFICANT

Sulci cutis, cristi cutis, papillary projections, hyperpigmented blotches, crypts showed significant association with Burke's clinical grade of AN (all three parameters- neck severity, neck axilla, neck texture).

Clinical Analysis Vs Nail Fold Capillaroscopy

Table 48: Association of neck severity (Burke's grading) with drop outs

Crosstab						
			DROP OUTS			Total
			2	3	4	
NECK SEVERITY	1					
		Count	0	0	2	2
		% within NECK SEVERITY	0.0%	0.0%	100.0%	100.0%
	2					
		Count	0	6	5	11
		% within NECK SEVERITY	0.0%	54.5%	45.5%	100.0%
	3					
		Count	0	11	30	41
	% within NECK SEVERITY	0.0%	26.8%	73.2%	100.0%	
4						
	Count	2	3	24	29	
	% within NECK SEVERITY	6.9%	10.3%	82.8%	100.0%	
Total						
		Count	2	20	61	83
		% within NECK SEVERITY	2.4%	24.1%	73.5%	100.0%

As p value is 0.051(>0.05) according to chi square test, there no significant association between the neck severity(Burke's grade) and dropouts.

Table 49: Association of neck severity (Burke's grading) with tortuous capillaries

		Crosstab						
		TORTUOUS CAPIL						
		0	1	2	3	4	Total	
NECK SEVERITY	1	Count	0	2	0	0	0	2
		% within NECK SEVERITY	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
	2	Count	0	0	6	2	3	11
		% within NECK SEVERITY	0.0%	0.0%	54.5%	18.2%	27.3%	100.0%
	3	Count	2	0	4	28	7	41
		% within NECK SEVERITY	4.9%	0.0%	9.8%	68.3%	17.1%	100.0%
	4	Count	6	8	0	8	7	29
		% within NECK SEVERITY	20.7%	27.6%	0.0%	27.6%	24.1%	100.0%
Total	Count	8	10	10	38	17	83	
	% within NECK SEVERITY	9.6%	12.0%	12.0%	45.8%	20.5%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the neck severity(Burke's grade) and tortuous capillaries. As clinical grade increased presence of tortuous capillaries in nail folds increased.

Table 50: Association of neck severity (Burke's grading) with cross-linked capillaries

			Crosstab					Total
			CROSS LINKED CAPILLARIES					
			0	1	2	3	4	
NECK	1	Count	0	2	0	0	0	2

							Results
SEVERITY							
	% within NECK SEVERITY	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
2	Count	0	0	9	0	2	11
	% within NECK SEVERITY	0.0%	0.0%	81.8%	0.0%	18.2%	100.0%
3	Count	6	5	18	10	2	41
	% within NECK SEVERITY	14.6%	12.2%	43.9%	24.4%	4.9%	100.0%
4	Count	5	2	12	4	6	29
	% within NECK SEVERITY	17.2%	6.9%	41.4%	13.8%	20.7%	100.0%
Total	Count	11	9	39	14	10	83
	% within NECK SEVERITY	13.3%	10.8%	47.0%	16.9%	12.0%	100.0%

As p value is 0.002(<0.05) according to chi square test, there is a significant association between the neck severity (Burke's grade) and crosslinked capillaries. As clinical grade increased presence of crosslinked capillaries in nail folds increased.

Table 51: Association of neck severity (Burke's grading) with giant capillaries

			Crosstab			
			GIANT CAPILLARIES			
			0	1	2	Total
NECK SEVERITY	1	Count	2	0	0	2
		% within NECK SEVERITY	100.0%	0.0%	0.0%	100.0%
	2	Count	11	0	0	11
		% within NECK SEVERITY	100.0%	0.0%	0.0%	100.0%
	3	Count	35	2	4	41
		% within NECK SEVERITY	85.4%	4.9%	9.8%	100.0%
	4	Count	19	8	2	29
		% within NECK SEVERITY	65.5%	27.6%	6.9%	100.0%

		Results			
Total	Count	67	10	6	83
	% within NECK SEVERITY	80.7%	12.0%	7.2%	100.0%

As p value is 0.063(>0.05) according to chi square test, there is no significant association between the neck severity(Burke's grade) and giant capillaries.

Table 52: Association of neck severity (Burke's grading) with haemorrhage

Crosstab					
			HAEMORRHAGE		
			0	1	Total
NECK SEVERITY	1	Count	2	0	2
		% within NECK SEVERITY	100.0%	0.0%	100.0%
	2	Count	11	0	11
		% within NECK SEVERITY	100.0%	0.0%	100.0%
	3	Count	37	4	41
		% within NECK SEVERITY	90.2%	9.8%	100.0%
	4	Count	27	2	29
		% within NECK SEVERITY	93.1%	6.9%	100.0%
Total	Count	77	6	83	
	% within NECK SEVERITY	92.8%	7.2%	100.0%	

As p value is 0.704(>0.05) according to chi square test, there is no significant association between the neck severity(Burke's grade) and haemorrhage.

Table 53: Association of neck severity (Burke's grading) with ramified capillaries

Crosstab

RAMIFIED CAPILLARIES

			Results					
			0	1	2	3	4	Total
NECK SEVERITY	1	Count	2	0	0	0	0	2
		% within NECK SEVERITY	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	2	Count	8	0	3	0	0	11
		% within NECK SEVERITY	72.7%	0.0%	27.3%	0.0%	0.0%	100.0%
	3	Count	21	8	4	4	4	41
		% within NECK SEVERITY	51.2%	19.5%	9.8%	9.8%	9.8%	100.0%
	4	Count	16	0	3	4	6	29
		% within NECK SEVERITY	55.2%	0.0%	10.3%	13.8%	20.7%	100.0%
Total	Count	47	8	10	8	10	83	
	% within NECK SEVERITY	56.6%	9.6%	12.0%	9.6%	12.0%	100.0%	

As p value is 0.132(>0.05) according to chi square test, there is no significant association between the neck severity(Burke's grade) and ramified capillaries.

Table 54: Association of neck severity (Burke's grading) with ectasia

			ECTAS		Total
			0	1	
NECK SEVERITY	1	Count	2	0	2
		% within NECK SEVERITY	100.0%	0.0%	100.0%
	2	Count	11	0	11
		% within NECK SEVERITY	100.0%	0.0%	100.0%
	3	Count	39	2	41
		% within NECK SEVERITY	95.1%	4.9%	100.0%

				Results	
4	Count	27	2	29	
	% within NECK SEVERITY	93.1%	6.9%	100.0%	
Total	Count	79	4	83	
	% within NECK SEVERITY	95.2%	4.8%	100.0%	

As p value is 0.818(>0.05) according to chi square test, there is no significant association between the neck severity(Burke's grade) and ectasia

Table 55: Association of neck texture (Burke's grading) with drop outs

			Crosstab			
			DROP OUTS			
			2	3	4	Total
NECK TEXTURE	1	Count	0	4	8	12
		% within NECK TEXTURE	0.0%	33.3%	66.7%	100.0%
	2	Count	0	5	16	21
		% within NECK TEXTURE	0.0%	23.8%	76.2%	100.0%
	3	Count	2	11	37	50
		% within NECK TEXTURE	4.0%	22.0%	74.0%	100.0%
Total	Count	2	20	61	83	
	% within NECK TEXTURE	2.4%	24.1%	73.5%	100.0%	

As p value is 0.748(>0.05) according to chi square test, there is no significant association between the neck texture (Burke's grade) and drop outs.

Table 56: Association of neck texture (Burke's grading) with tortuous capillaries

			Crosstab					
			ROUS CAP					
			0	1	2	3	4	Total
NECK TEXTURE	1	Count	0	2	4	0	6	12
		% within NECK TEXTURE	0.0%	16.7%	33.3%	0.0%	50.0%	100.0%
	2	Count	0	0	2	19	0	21
		% within NECK TEXTURE	0.0%	0.0%	9.5%	90.5%	0.0%	100.0%
	3	Count	8	8	4	19	11	50
		% within NECK TEXTURE	16.0%	16.0%	8.0%	38.0%	22.0%	100.0%
Total	Count		8	10	10	38	17	83
	% within NECK TEXTURE		9.6%	12.0%	12.0%	45.8%	20.5%	100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the neck texture (Burke's grade) and tortuous capillaries. As clinical grade increased presence of tortuous capillaries in nailfolds increased.

Table 57: Association of neck texture (Burke's grading) with cross linked capillaries

			Crosstab					
			CROSS LINKED CAPILLARIES					
			0	1	2	3	4	Total
NECK TEXTURE	1	Count	0	2	10	0	0	12
		% within NECK TEXTURE	0.0%	16.7%	83.3%	0.0%	0.0%	100.0%
	2	Count	4	4	11	0	2	21
		% within NECK TEXTURE	19.0%	19.0%	52.4%	0.0%	9.5%	100.0%

							Results
	3	% within NECK TEXTURE	19.0%	19.0%	52.4%	0.0%	100.0%
		Count	7	3	18	14	50
		% within NECK TEXTURE	14.0%	6.0%	36.0%	28.0%	100.0%
		Count	11	9	39	14	83
Total		% within NECK TEXTURE	13.3%	10.8%	47.0%	16.9%	100.0%

As p value is 0.007(<0.05) according to chi square test, there is a significant association between the neck texture (Burke's grade) and cross linked capillaries. As clinical grade increased presence of cross linked capillaries in nailfolds increased.

Table 58: Association of neck texture (Burke's grading) with giant capillaries

				NT CAPILLAI			Total
				0	1	2	
NECK TEXTURE	1	Count		12	0	0	12
		% within NECK TEXTURE		100.0%	0.0%	0.0%	100.0%
	2	Count		17	2	2	21
		% within NECK TEXTURE		81.0%	9.5%	9.5%	100.0%
	3	Count		38	8	4	50
		% within NECK TEXTURE		76.0%	16.0%	8.0%	100.0%
Total	Count			67	10	6	83
	% within NECK TEXTURE			80.7%	12.0%	7.2%	100.0%

As p value is 0.412(>0.05) according to chi square test, there no significant association between the neck texture (Burke's grade) and giant capillaries.

Table 59: Association of neck texture (Burke's grading) with haemorrhage

Crosstab			HAEMORRHAGE		
			0	1	Total
NECK TEXTURE	1	Count	12	0	12
		% within NECK TEXTURE	100.0%	0.0%	100.0%
	2	Count	19	2	21
		% within NECK TEXTURE	90.5%	9.5%	100.0%
	3	Count	46	4	50
		% within NECK TEXTURE	92.0%	8.0%	100.0%
Total	Count	77	6	83	
	% within NECK TEXTURE	92.8%	7.2%	100.0%	

As p value is 0.564(>0.05) according to chi square test, there no significant association between the neck texture (Burke's grade) and haemorrhage.

Table 60: Association of neck texture (Burke's grading) with ramified capillaries

Crosstab			RAMIFIED CAPILLARIES					Total
			0	1	2	3	4	
NECK TEXTURE	1	Count	6	0	6	0	0	12
		% within NECK TEXTURE	50.0%	0.0%	50.0%	0.0%	0.0%	100.0%

							Results
2	Count	17	0	0	4	0	21
	% within NECK TEXTURE	81.0%	0.0%	0.0%	19.0%	0.0%	100.0%
3	Count	24	8	4	4	10	50
	% within NECK TEXTURE	48.0%	16.0%	8.0%	8.0%	20.0%	100.0%
Total	Count	47	8	10	8	10	83
	% within NECK TEXTURE	56.6%	9.6%	12.0%	9.6%	12.0%	100.0%

As p value is 0.001(<0.05) according to chi square test, there is a significant association between the neck texture (Burke's grade) and ramified capillaries. As clinical grade increased the presence of ramified capillaries in nail fold increased.

Table 61: Association of neck texture (Burke's grading) with ectasia

			ECTAS		Total
			0	1	
NECK TEXTURE	1	Count	12	0	12
		% within NECK TEXTURE	100.0%	0.0%	100.0%
	2	Count	21	0	21
		% within NECK TEXTURE	100.0%	0.0%	100.0%
	3	Count	46	4	50
		% within NECK TEXTURE	92.0%	8.0%	100.0%
Total	Count		79	4	83
	% within NECK TEXTURE		95.2%	4.8%	100.0%

As p value is 0.250(>0.05) according to chi square test, there no significant association between the neck texture (Burke's grade) and ramified capillaries.

Table 62: Association of axilla (Burke's grading) with drop outs

			Crosstab			Total
			DROP OUTS			
			2	3	4	
AXILLA	1	Count	0	5	3	8
		% within AXILLA	0.0%	62.5%	37.5%	100.0%
	2	Count	0	2	6	8
		% within AXILLA	0.0%	25.0%	75.0%	100.0%
	3	Count	2	7	27	36
		% within AXILLA	5.6%	19.4%	75.0%	100.0%
	4	Count	0	4	12	16
		% within AXILLA	0.0%	25.0%	75.0%	100.0%
Total	Count	2	18	48	68	
	% within AXILLA	2.9%	26.5%	70.6%	100.0%	

As p value is 0.253(>0.05) according to chi square test, there no significant association between the axilla (Burke's grade) and drop outs.

Table 63: Association of axilla (Burke's grading) with tortuous capillaries

			Crosstab					
			TORTURO		LARIAS			
			0	1	2	3	4	Total
AXILLA	1	Count	0	3	2	3	0	8
		% within AXILLA	0.0%	37.5%	25.0%	37.5%	0.0%	100.0%

Results							
2	Count	0	0	2	6	0	8
	% within AXILLA	0.0%	0.0%	25.0%	75.0%	0.0%	100.0%
3	Count	4	3	4	15	10	36
	% within AXILLA	11.1%	8.3%	11.1%	41.7%	27.8%	100.0%
4	Count	4	2	0	6	4	16
	% within AXILLA	25.0%	12.5%	0.0%	37.5%	25.0%	100.0%
Total	Count	8	8	8	30	14	68
	% within AXILLA	11.8%	11.8%	11.8%	44.1%	20.6%	100.0%

As p value is 0.054(>0.05) according to chi square test, there no significant association between the axilla (Burke's grade) and tortuous capillaries.

Table 64: Association of axilla (Burke's grading) with cross linked capillaries

		Crosstab						
		ROSS LINKED CAPILLARIES						Total
			0	1	2	3	4	
AXILLA	1	Count	0	0	8	0	0	8
		% within AXILLA	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
	2	Count	6	0	2	0	0	8
		% within AXILLA	75.0%	0.0%	25.0%	0.0%	0.0%	100.0%
	3	Count	5	7	16	6	2	36
		% within AXILLA	13.9%	19.4%	44.4%	16.7%	5.6%	100.0%
	4	Count	0	0	4	6	6	16
		% within AXILLA	0.0%	0.0%	25.0%	37.5%	37.5%	100.0%
Total	Count	11	7	30	12	8	68	
	% within AXILLA	16.2%	10.3%	44.1%	17.6%	11.8%	100.0%	

As p value is 0.001(<0.05) according to chi square test, there no significant association between the axilla (Burke's grade) and crosslinked capillaries. As clinical grade increased the presence of crosslinked capillaries in nail folds increased.

Table 65: Association of axilla (Burke's grading) with giant capillaries

			Crosstab			
			GIANT CAPILLARIES			
			0	1	2	Total
AXILLA	1	Count	8	0	0	8
		% within AXILLA	100.0%	0.0%	0.0%	100.0%
	2	Count	8	0	0	8
		% within AXILLA	100.0%	0.0%	0.0%	100.0%
	3	Count	30	4	2	36
		% within AXILLA	83.3%	11.1%	5.6%	100.0%
	4	Count	6	6	4	16
		% within AXILLA	37.5%	37.5%	25.0%	100.0%
Total	Count	52	10	6	68	
	% within AXILLA	76.5%	14.7%	8.8%	100.0%	

As p value is 0.003(<0.05) according to chi square test, there no significant association between the axilla (Burke's grade) and giant capillaries. As clinical grade increased the presence of giant capillaries in nail folds increased.

Table 66: Association of axilla (Burke's grading) with haemorrhage

Crosstab				
		HAEMORRHAGE		
		0	1	Total

AXILLA	1	Count	8	0	8
		% within AXILLA	100.0%	0.0%	100.0%
	2	Count	6	2	8
		% within AXILLA	75.0%	25.0%	100.0%
	3	Count	36	0	36
		% within AXILLA	100.0%	0.0%	100.0%
	4	Count	12	4	16
		% within AXILLA	75.0%	25.0%	100.0%
Total	Count		62	6	68
	% within AXILLA		91.2%	8.8%	100.0%

As p value is 0.007(<0.05) according to chi square test, there no significant association between the axilla (Burke's grade) and haemorrhage . As clinical grade increased the presence of haemorrhage in nail folds increased.

Table 67: Association of axilla (Burke's grading) with ramified capillaries

Crosstab								
			RAMIFIED CAPILLARIES					
			0	1	2	3	4	Total
AXILLA	1	Count	8	0	0	0	0	8
		% within AXILLA	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
	2	Count	4	0	2	2	0	8
		% within AXILLA	50.0%	0.0%	25.0%	25.0%	0.0%	100.0%
	3	Count	17	6	5	2	6	36
		% within AXILLA	47.2%	16.7%	13.9%	5.6%	16.7%	100.0%
	4	Count	6	2	0	4	4	16
		% within AXILLA	37.5%	12.5%	0.0%	25.0%	25.0%	100.0%
Total		Count	35	8	7	8	10	68

Results						
% within AXILLA	51.5%	11.8%	10.3%	11.8%	14.7%	100.0%

As p value is 0.052(>0.05) according to chi square test, there is no significant association between the axilla (Burke's grade) and ramified capillaries.

Table 68: Association of axilla (Burke's grading) with ecatsia

Crosstab			ECT ASIA		Total
			0	1	
AXILLA	1	Count	8	0	8
		% within AXILLA	100.0%	0.0%	100.0%
	2	Count	8	0	8
		% within AXILLA	100.0%	0.0%	100.0%
	3	Count	34	2	36
		% within AXILLA	94.4%	5.6%	100.0%
	4	Count	14	2	16
		% within AXILLA	87.5%	12.5%	100.0%
Total	Count		64	4	68
	% within AXILLA		94.1%	5.9%	100.0%

As p value is 0.518(>0.05) according to chi square test, there is no significant association between the axilla (Burke's grade) and ectasia.

Table 69: Summary of Clinical Vs Nail fold capillaroscopy findings

NFC Findings	NECK SEVERITY	NECK TEXTURE	AXILLA
DROPOUTS	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT

TORTUOUS	SIGNIFICANT	SIGNIFICANT	NOT SIGNIFICANT
CROSS LINKED	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
GIANT CAPILLARIES	NOT SIGNIFICANT	NOT SIGNIFICANT	SIGNIFICANT
HAEMORRHAGE	NOT SIGNIFICANT	NOT SIGNIFICANT	SIGNIFICANT
RAMIFIED	NOT SIGNIFICANT	SIGNIFICANT	NOT SIGNIFICANT
ECTASIA	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT

Tortuous capillaries showed significant association with Burke's clinical grade of AN (neck severity, neck texture). Cross linked capillaries showed significant association with Burke's clinical grade of AN (neck severity, neck texture, axilla)

Duration Vs Dermoscopy

Table 70: Association of duration with neck sulci cutis

1 - Prominent

2 - Not prominent

0 - Absent

	N	Mean	Std. Deviation	Std. Error
1	80	3.8781	1.96448	.21964
2	17	2.1176	.76095	.18456

Total	97	3.5696	1.93001	.19596
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As p value is 0.001(<0.05) according to anova test, there is a significant association between the duration and sulci cutis. As duration increased sulci became more prominent.

Table 71: Association of duration with neck cristi cutis

1 - Rhomboid formation present

2 - Rhomboid formation absent

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	2	3.0010	.00100	.00100
1	63	4.1151	2.00192	.25209
2	32	2.5313	1.33765	.23647
Total	97	3.5696	1.93001	.19596

As p value is 0.001(<0.05) according to anova test, there is a significant association between the duration and cristi cutis. As duration increased more rhomboid formation was seen.

Table 72: Association of duration with neck papillary projections

1 -Non- triangular

2 - Triangular

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	3	2.0010	.00100	.00100
1	55	4.2773	2.00386	.27020
2	39	2.6923	1.41242	.22617
Total	97	3.5696	1.93001	.19596

As p value is 0.001(<0.05) according to anova test, there is a significant association between the duration and papillary projections. As duration increased papillary projections became non triangular.

Table 73: Association of duration with neck hyperpigmented dots and globules

1 - <50

2 - >50

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	42	2.8333	1.45948	.22520
1	31	4.0081	2.32422	.41744
2	24	4.2917	1.70623	.34828
Total	97	3.5696	1.93001	.19596

As p value is 0.003(<0.05) according to anova test, there is a significant association between the duration and hyperpigmented dots/globules. As duration increased number of hyperpigmented dots/globules increased.

Table 74: Association of duration with neck colour of hyperpigmented dots/globules

1 - Dark brown

2 - Light brown

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	44	2.9318	1.49647	.22560
1	30	4.7083	2.28948	.41800
2	23	3.3043	1.52061	.31707
Total	97	3.5696	1.93001	.19596

As p value is
according to
is a significant

0.001(<0.05)
anova test, there
association

between the duration and hyperpigmented dots/globules. As duration increased colour of hyperpigmented dots/globules became darker.

Table 75: Association of duration with neck hyperpigmented blotches

1- Present

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	54	2.9630	1.50111	.20427
1	43	4.3314	2.14554	.32719
Total	97	3.5696	1.93001	.19596

As p value is 0.001(<0.05) according to anova test, there is a significant association between the duration of AN and hyperpigmented blotches. As duration increased presence of hyperpigmented blotches increased.

Table 76: Association of duration with neck crypts

1- Present

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	68	2.9449	1.40285	.17012

1	29	5.0345	2.21170	.41070
Total	97	3.5696	1.93001	.19596

As p value is 0.001(<0.05) according to anova test, there is a significant association between the duration of AN and crypts. As duration increased presence of crypts increased.

Table 77: Association of duration with neck white streaks/globules

1- Present

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	91	3.6291	1.92944	.20226
1	6	2.6667	1.86190	.76012
Total	97	3.5696	1.93001	.19596

As p value is 0.239 (>0.05) according to anova test, there is no significant association between the duration of AN and crypts.

Table 78: Association of duration of AN with right axilla sulci cutis

1 - Prominent

2 - Not prominent

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	2	1.0010	.00100	.00100
1	70	4.1179	1.96745	.23516
2	8	2.0010	.00100	.00100

Total	80	3.8281	1.99905	.22350
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As p value is 0.002(<0.05) there is a significant association between duration of AN and right axilla sulci cutis . As duration of AN increased sulci cutis became more prominent

Table 79: Association of duration of AN with right axilla cristi cutis

1 - Rhomboid formation present

2 - Rhomboid formation absent

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	17	3.0735	2.77793	.67375
1	40	4.5250	1.55229	.24544
2	23	3.1739	1.64184	.34235
Total	80	3.8281	1.99905	.22350

As p value is 0.006(<0.05) there is a significant association between duration of AN and right axilla cristi cuti . As duration of AN increased presence of rhomboid formation increased.

Table 80: Association of duration of AN with right axilla papillary projections

1 -Non- triangular

2 - Triangular

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	12	2.4167	1.31137	.37856
1	55	4.2409	2.07217	.27941
2	13	3.3846	1.55662	.43173
Total	80	3.8281	1.99905	.22350

As p value is 0.010(<0.05) there is a significant association between duration of AN and right axilla papillary projection. As duration of AN increased papillary projections became non-triangular.

Table 81: Association of duration of AN with right hyperpigmented dots/globules

1 - <50

2 - >50

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	21	2.5238	1.56905	.34239
1	15	2.7500	1.18397	.30570
2	44	4.8182	1.87111	.28208
Total	80	3.8281	1.99905	.22350

As p value is 0.001(<0.05) there is a significant association between duration of AN and right axilla hyperpigmented dots/globules. As duration of AN increased number of hyperpigmented dots increased.

Table 82: Association of duration of AN with right axilla colour of hyperpigmented dots

1 - Dark brown

2 - Light brown

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	23	2.7391	1.65742	.34560
1	43	4.5174	2.08481	.31793
2	14	3.5000	1.34450	.35933
Total	80	3.8281	1.99905	.22350

As p value is 0.001(<0.05) there is a significant association between duration of AN and right axilla colour of hyperpigmented dots/globules. As duration of AN increased colour of hyperpigmented dots became darker.

Table 83: Association of duration of AN with right axilla hyperpigmented blotches

1- Present

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	47	3.6383	1.88155	.27445
1	33	4.0985	2.15597	.37531
Total	80	3.8281	1.99905	.22350

As p value is 0.314(>0.05) there is no significant association between duration of AN and right axilla hyperpigmented blotches.

Table 84: Association of duration of AN with right axilla crypts

1- Present

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	55	3.4955	2.00952	.27096
1	25	4.5600	1.80462	.36092
Total	80	3.8281	1.99905	.22350

As p value is 0.026(<0.05) there is a significant association between duration of AN and right axilla crypts. As duration of AN increased the presence of crypts increased.

Table 85: Association of duration of AN with right axilla white streaks/globules 1-Present

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	69	3.6993	2.11723	.25489
1	11	4.6364	.50452	.15212
Total	80	3.8281	1.99905	.22350

As p value is 0.150 (>0.05) there is no significant association between duration of AN and right axilla white streaks/globules.

Table 86: Association of duration of AN with left axilla sulci cutis

1 - Prominent

2 - Not prominent

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	2	1.0010	.00100	.00100
1	68	4.1801	1.96178	.23790
2	10	2.0010	.00100	.00100
Total	80	3.8281	1.99905	.22350

As p value is 0.001 (<0.05) there is a significant association between duration of AN and left axilla sulci cutis. As duration of AN increased sulci cutis became more prominent.

Table 87: Association of duration of AN with left axilla cristi cutis

1 - Rhomboid formation present

2 - Rhomboid formation absent

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	27	3.8611	2.64242	.50853
1	34	4.5000	1.44075	.24709
2	19	2.5789	1.07061	.24561
Total	80	3.8281	1.99905	.22350

As p value is 0.003(<0.05) there is a significant association between duration of AN and left axilla cristi cutis. As duration of AN increased presence of rhomboid formation increased.

Table 88: Association of duration of AN with left axilla papillary projection

1 -Non- triangular

2 - Triangular

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	13	3.6923	3.22451	.89432
1	55	4.0591	1.74733	.23561
2	12	2.9167	1.08362	.31282
Total	80	3.8281	1.99905	.22350

As p value is 0.195(>0.05) there is no significant association between duration of AN and left axilla papillary projection.

Table 89: Association of duration of AN with left axilla hyperpigmented dots

1 - <50

2 - >50

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	21	2.5238	1.56905	.34239
1	15	2.6167	.93954	.24259
2	44	4.8636	1.86262	.28080
Total	80	3.8281	1.99905	.22350

As p value is 0.001(<0.05) there is a significant association between duration of AN and left axilla hyperpigmented dots/globules . As duration of AN increased number of hyperpigmented increased.

Table 90: Association of duration of AN with left axilla colour of hyperpigmented dots

1 - Dark brown

2 - Light brown

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	23	2.7391	1.65742	.34560
1	45	4.4056	2.10336	.31355
2	12	3.7500	1.28806	.37183
Total	80	3.8281	1.99905	.22350

As p value is 0.004(<0.05) there is a significant association between duration of AN and left axilla colour of hyperpigmented dots/globules . As duration of AN increased colour of hyperpigmented dots/globules became darker.

Table 91: Association of duration of AN with left axilla hyperpigmented blotches

1- Present

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	44	3.5455	1.91025	.28798
1	36	4.1736	2.07693	.34616
Total	80	3.8281	1.99905	.22350

As p value is 0.163 (>0.05) there is no significant association between duration of AN and left axilla hyperpigmented blotches.

Table 92: Association of duration of AN with left axilla crypts

1- Present

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	54	3.4861	2.03647	.27713
1	26	4.5385	1.74885	.34298
Total	80	3.8281	1.99905	.22350

As p value is 0.026 (<0.05) there is significant association between duration of AN and left axilla white crypts. As duration of AN increased presence of crypts increased.

Table 93: Association of duration of AN with left axilla white streaks and globules 1- Present

0 - Absent

	N	Mean	Std. Deviation	Std. Error
0	67	3.6604	2.13676	.26105
1	13	4.6923	.48038	.13323
Total	80	3.8281	1.99905	.22350

As p value is 0.089 (>0.05) there is no significant association between duration of AN and left axilla white streaks/globules.

Table 94: Summary of duration Vs dermoscopy findings

<u>Dermoscopy</u>	NECK	RIGHT AXILLA	LEFT AXILLA
<u>SULCI CUTIS</u>	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
<u>CRISTI CUTIS</u>	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
<u>PAPILLARY PROJECTION</u>	SIGNIFICANT	SIGNIFICANT	NOT SIGNIFICANT
<u>HYPERPIGMENTED DOTS AND GLOBULES</u>	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
<u>COLOUR OF HYPERPIGMENTED DOTS</u>	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
<u>HYPERPIGMENTED BLOTCHES</u>	SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT
<u>CRYPTS</u>	SIGNIFICANT	SIGNIFICANT	SIGNIFICANT
<u>WHITE STREAKS AND GLOBULES</u>	NOT SIGNIFICANT	NOT SIGNIFICANT	NOT SIGNIFICANT

Sulci cutis, cristi cutis, hyperpigmented dots, colour of hyperpigmented dots, crypts of neck and bilateral axilla had a significant association with duration of AN.

Duration Vs Nail Fold Capillaroscopy

Table 95: Association of duration of AN with drop outs

	N	Mean	Std. Deviation	Std. Error
2	2	4.0010	.00100	.00100
3	20	3.8500	2.00722	.44883
4	61	3.5410	1.94357	.24885
Total	83	3.6265	1.92836	.21166

As p value is 0.797 (>0.05) there is no significant association of duration of AN with drop outs.

Table 96: Association of duration of AN with tortuous capillaries

	N	Mean	Std. Deviation	Std. Error
0	8	4.2500	.88641	.31339
1	10	4.3000	2.57337	.81377
2	10	2.4000	.51640	.16330
3	38	3.6842	2.30282	.37357
4	17	3.5294	1.06757	.25892
Total	83	3.6265	1.92836	.21166

As p value is 0.186 (>0.05) there is no significant association of duration of AN with tortuous capillaries .

Table 97: Association of duration of AN with cross linked capillaries

	N	Mean	Std. Deviation	Std. Error
0	11	2.6364	.80904	.24393

1	9	3.2222	2.26538	.75513
2	39	3.3590	1.47768	.23662
3	14	5.5714	2.65197	.70877
4	10	3.4000	1.26491	.40000
Total	83	3.6265	1.92836	.21166

As p value is 0.001 (<0.05) there is a significant association of duration of AN with cross linked capillaries. As duration on AN increased the presence of cross linked capillaries in nail folds increased.

Table 98: Association of duration of AN with giant capillaries

	N	Mean	Std. Deviation	Std. Error
0	67	3.5373	2.05292	.25080
1	10	3.8000	1.39841	.44222
2	6	4.3333	1.03280	.42164
Total	83	3.6265	1.92836	.21166

As p value is 0.603 (>0.05) there is no significant association of duration of AN with giant capillaries .

Table 99: Association of duration of AN with haemorrhage

	N	Mean	Std. Deviation	Std. Error
0	77	3.5974	1.90574	.21718
1	6	4.0010	2.36643	.96609
Total	83	3.6265	1.92836	.21166

As p value is 0.625 (>0.05) there is no significant association of duration of AN with haemorrhage.

Table 100: Association of duration of AN with ramified capillaries

	N	Mean	Std. Deviation	Std. Error
0	47	3.3830	1.77302	.25862
1	8	5.2500	1.38873	.49099
2	10	2.6000	.51640	.16330
3	8	3.0010	1.30931	.46291
4	10	5.0010	2.90593	.91894
Total	83	3.6265	1.92836	.21166

As p value is 0.003 (<0.05) there is a significant association of duration of AN with ramified capillaries. As duration of AN increased the presence of ramified capillaries in nailfolds increased.

Table 101: Association of duration of AN with Ectasia

	N	Mean	Std. Deviation	Std. Error
0	79	3.6076	1.96226	.22077
1	4	4.0010	1.15470	.57735
Total	83	3.6265	1.92836	.21166

As p value is 0.694 (>0.05) there is no significant association of duration of AN with ectasia.

Table 102: Summary of duration Vs Nail fold capillaroscopy findings

DROPOUTS	NOT SIGNIFICANT
TORTUOUS	NOT SIGNIFICANT
CROSS LINKED	SIGNIFICANT
GIANT CAPILLARIES	NOT SIGNIFICANT
HAEMORRHAGE	NOT SIGNIFICANT
RAMIFIED	SIGNIFICANT
ECTASIA	NOT SIGNIFICANT

Cross linked and ramified capillaries had significant association with duration of AN.

DISCUSSION

The association of acanthosis nigricans with insulin resistance is well known and highlighted by many authors. Dermoscopy in AN has been described by a few. Nail fold capillaroscopy in diabetic states has been studied, but no studies are available on correlation of dermoscopy and NFC changes in AN.

This study is an attempt to understand the association of clinical and dermoscopic findings of AN with nail fold capillaroscopy changes.

It is a hospital based cross-sectional study carried out on a total of 97 patients over a span of one year.

Age group

Out of a total of 97 patients, majority patients have been observed between the age group of 16 – 25 years – 38/97 (39.17%) followed by 26-35 years – 17/97 (17.52%)[Range 10 – 67 yrs]. These findings are similar to a study by Tank et al.¹ where the most common age group with AN was 11-20 years with 32.9% patients, 24.9% patients were between 21-30 years [Range 5 – 71 yrs]. In a study done by S. S. Pardeshi et al.² most cases (46.6%) were in the range of 21-40 years followed by age less than 20 years (33%). [Range- No age limit]. This minor difference may be due to the wide range of age group in the study. In a study done by Ananthi M et al.⁴² 72 (96%) participants were less than 40 yrs of age, among which 10 (13%) belonged to paediatric age group. There were only 3(4%) patients > 40 years. Maximum belonged to adolescent age group 26 (35%) and early adulthood 29(39%) which was similar to our findings.

Sex preponderance

We observed female preponderance in our study. Out of the 97 patients 71/97 (71.13%) were females and 26/97(26.80%) patients were males. Similar findings were found in a study done by Puri N et al.⁴³ where females were 18/30(60%) and males were 12/30(40%). In a study done by S S Pardeshi et al.² males (59.2%) outnumbered females (40.8%). This discrepancy may be due to the possibility that females presented more with AN as a cosmetic concern.

Presence of Acrochordons

In the present study acrochordons were (49/97) 49%. Singh SK et al.⁴⁴ study found AN and acrochordons to be linked to IR.

BMI according to Asian classification

Most, 50/97 (51.54%) participants were seen in obese class I (23.0-24.9 kg/m²) followed by 41/97 (42.2%) in obese class II (≥ 30 kg/m²) followed by underweight and normal each 3%.

In a study done by Bolding et al.⁴⁵ patients with AN had a higher mean BMI (39.7 kg/m²). Other studies did not show findings according to BMI Asian classification.

Fitzpatrick skin type

The most common Fitzpatrick skin type observed in the present study was Type 4 – 64/97 (66%) followed by type 3 – 24/97(24.7%). The least common was type 2 (3.1%).

The majority (45/70, 64.28%) of population in a study done by VK Sharma et al.⁴⁶ belonged. to Fitzpatrick skin phototype IV, followed in frequency by III, II and V/VI, similar to findings in our study.

In study done by Pai GS et al.⁴⁷ types IV and V were common.

Burke's clinical scale for AN

In the present study most of the cases were in stage 3 – 47/97(48.5%) followed by stage 4 – 35/97 (36.1%) followed by stage 2- 13/97 (13.4%) and stage 1 2/97 (21.1%) as per grading of neck severity. In the context to the neck texture, stage 3 - 58/97(59.8%) was the commonest finding followed by stage 2 - 27/97 (27.8%) and then stage 1 - 12/97 (12.4%). In the axilla stage 3 was the commonest 43/97 (44.3%) followed by stage 4 – 23/97 (23.7%) then followed by stage 2 and 1- 8.2% each.

In a study done by S S Pardeshi et al.² have reported similar findings were seen where most of the cases were in stage 3 or 4 as per grading of severity of neck (83.5%). Only 1% cases were of grade I, 15.5% grade II, 32%grade.III and 15.5% having grade IV as per neck texture. Almost half of cases were of grade III according to axilla severity.

In a study done by S Venkataswami et al.⁴⁸ 17.3% had grade I acanthosis nigricans of axilla, (48%) had grade II, (18%) had grade III and (12.7%) had grade IV.

Sites involved

Neck was involved in all patients 97/97 (100%), involvement of axilla was seen in 80/97 (82.47%) patients in the present study. In a study done by PK Varthakavi et al.⁴⁹ the neck. involvement was (100%) and axilla involvement was (80.6%) which was similar to our

finding. In a study done by Puri et al.⁴³ neck (93.3%) was the commonest site followed by axilla in 66.6%.

Table 103: Comparison of dermoscopy findings seen in the present study and two other studies is as follows.

Dermoscopy findings	Present study			S. S. Pardeshi et al. ²	Shah et al. ²⁴
	Neck	Right Axilla	Left Axilla	Not specified	Face
Sulci Cutis	97/97 (100%)	72/80 (90%)	78/80 (97.5%)	103/103 (100%)	Seen (Percentage not specified)
Cristi Cutis	95/97 (97.93%)	63/80 (78.75%)	53/80 (66.25%)	102/103 (99%)	Seen (Percentage not specified)
Hyperpigmented dots/globules	55/97 (56.70%)	59/80 (73.75%)	59/80 (73.75%)	48/103 (46.6%)	Seen (Percentage not specified)
Papillary projections	94/97 (96.90%)	68/80 (85%)	67/80 (83.75%)	86/103 (83.5%)	Not seen
Hyperpigmented blotches	43/97 (44.3%)	33/80 (41.25%)	36/80 (45%)	4/103 (3.9%)	Not seen
Crypts	29/97 (29.89%)	25/80 (31.25%)	26/80 (32.5%)	30/103 (29.1%)	Not seen

Discussion					
White streaks/globules	6/97 (6.18%)	11/80 (13.75%)	13/80 (16.25%)	Not seen	Not seen

In our study the commonest finding over neck was sulci cutis 97/97(100%), followed by cristi cutis 95/97 (97.93%), papillary projections 94/97(96.90%), hyperpigmented dots/globules 55/97(56.70%), hyperpigmented blotches 43/97(44.3%), crypts 29/97(29.89%) in that order. The least common finding was white streaks/globules 6/97(6.18%). These findings were similar to the findings of a study done by S.S. Pardeshi et al.² where sulci cutis was the most common finding 103/103 (100%) followed by cristi cutis 102/103 (99%). Papillary projections were seen in 86/103 (83.5%) participants.

In a clinic investigative study on facial AN done by Shah et al.²⁴ sulci cutis, cristi cutis, hyperpigmented dots/globules, follicular plugging were observed. Papillary projections were not observed.

In another case series study done by Ranglani et al.⁵⁰ the most common finding was the presence of sulci cutis and cristae cutis. Other findings were hyperpigmented dots and milia like cysts. In a study done by Minas et al.⁵¹ exophytic papillary structures, multiple asymmetric blotches and milia like cysts in AN.

We attribute the presence of white globules /streaks to scarring due to scratching or hair removal.

Association of Burke's clinical scale for AN and dermoscopy

In the present study sulci cutis and cristi cutis showed significant association with clinical Burke's grading in neck as well as axilla (p value <0.05). As the clinical grade increased sulci cutis became prominent and cristi cutis showed rhomboid formation.

Papillary projections became non-triangular from triangular as clinical grade increased. (p value < 0.05)

Number of hyperpigmented dots/globules increased as neck texture and clinical grade of axilla increased. (p value < 0.05)

Presence of crypts and hyperpigmented blotches increased as clinical grade increased. (p value < 0.05)

White globules and streaks did not have a significant association with clinical grade and we attribute its presence to factors such as scarring due to scratching and friction.

It was also found that hyperpigmented dots were more in number in axilla (especially axillary folds).

Parallel findings were seen in a study by Shah V et al.²⁴ where he studied association of changes in dermoscopy in facial AN with Sharqie's grading of AN. The study highlighted the following findings – In mild clinical grade, follicular plugging and a less prominent sulci with irregular brown globules were seen. In moderate clinical grade of AN prominent sulci, large brown globules were seen and the severe grade showed markedly depressed sulci and prominent cristae which lead to the formation of rhomboid shaped islands.²⁴ These findings were also seen in our study.

Duration of AN and dermoscopy

In the present study sulci cutis and cristi cutis showed significant association with duration. As the duration increased sulci cutis became prominent and cristi cutis showed rhomboid formation. Papillary projections became non-triangular from triangular as clinical grade increased. (p value < 0.05). This finding was similar to the study done by Shah et al.²⁴ where chronic lesions showed exophytic papillary structures.

Number of hyperpigmented dots/globules increased as neck texture and clinical grade of axilla increased in the present study (p value < 0.05). These findings are similar with the study done by Shah V et al where chronic variants showed prominent sulci and dark brown globules.²⁴

Number of crypts increased and duration increased. (p value < 0.05).

These dermoscopy changes as clinical grade increases may be attributed to the increase of hyperkeratosis, papillomatosis, acanthosis and increased basal pigmentation on histopathology as duration of AN increases.

NFC findings seen in the present study and two other studies is as follows.

Currently there is dearth of literature on nail fold capillaroscopy in AN and/or insulin resistance hence we have compared our findings with studies showcasing NFC changes in type 2 DM. The rationale behind this being AN is a marker of insulin resistance which is a prediabetic state. A study done by Baranowska- Jurkun A et al.³⁸ suggests that individuals with impaired glucose metabolism, whose blood sugar levels exceed optimal values but do not meet the diagnostic criteria for diabetes mellitus, still experience microvascular complications associated with diabetes.

In our study 7/97 participants were known diabetics. 36 out of 97 patients who gave consent to get their HOMA IR done 21 had insulin resistance. (HOMA IR > 2) Presence of findings in ≥ 3 considered significant.

In 14 patients nail fold findings were not visible.

Table 104: Comparison of nailfold capillaroscopy findings seen in the present study and two other studies is as follows.

NFC changes	Present study	G Maldonado et al. ²⁹	Ahmad et al. ⁴⁰
Dropouts capillaries	83/83 (100%)	48% (Mentioned as avascular areas)	Not seen
Tortuous capillaries	61/83 (73.49 %)	63%	46.1%
Cross linked capillaries	55/83 (66.26%)	59%	30.9%
Giant capillaries	7/83 (8.43%)	11%	Not seen
Haemorrhage	6/83 (7.2%)	Not mentioned	28.6%

Ramified capillaries	26/83 (31.32 %)	Not mentioned	35.4%
Ectasia	6/83 (7.22 %)	39%	28.2%

In our study tortuous capillaries were seen in 61/83 (73.49%) participants, cross linked capillaries in 55/83 (66.26%) participants, giant capillaries in 7/83 (8.43%). Similar findings were seen in a study done by G Maldonado et al.²⁹ where tortuous capillaries were seen in 63%, cross-linked capillaries in 59%, giant capillaries in 11%. The slightly higher frequency of findings in our study may be attributed to the undetected prevalence of diabetes in the remaining 61 patients as the diabetic status was not known since they did not undergo the blood investigations for insulin resistance.

In our study ramified capillaries were seen in 26/83 (31.32%). This finding was similar to a study done by Ahmad et al.⁴⁰ ramified capillaries were seen in 35.4%

Drop outs were the most common findings in our study. They were seen in a study done by G Maldonado et al where they are mentioned as avascular areas (48%). It's high presence in our study may be due to the less visibility of a capillary at the end of the image due to the panoramic view.

Clinical grade of AN (Burke's) with Nail Fold capillaroscopy changes.

In the present study, tortuous capillaries showed significant association with neck severity and neck texture of clinical Burke's grading of AN (p value < 0.05). Cross linked capillaries showed significant association with neck severity, neck texture and axilla of clinical Burke's grading of AN.(p value < 0.05). As the clinical stage increased the

presence of the findings in the nail folds increased. There is absence of literature on grade of AN and it's association with NFC changes.

Duration of AN with Nail Fold capillaroscopy changes.

Crosslinked capillaries and ramified capillaries showed significant association with duration of AN, p value 0.001 and 0.003 respectively. As the duration of AN increased the presence of crosslinked capillaries and ramified capillaries in number of nailfolds increased.

Similar findings were seen in a study done by Shah et al.⁴¹ where duration of DM was statistically to NFC findings (P-value of 0.027) demonstrating that NFC findings like tortuous capillaries, avascular areas, ramified/bushy capillaries were more common in chronic diabetic cases.

CONCLUSION

This study shows that dermoscopic changes in Acanthosis Nigricans correspond to severity of AN as per Burke's clinical scale and duration of AN.

The NFC findings in AN seen were drop outs, tortuous, cross linked, ramified capillaries, ectasia. Ramified capillaries and crosslinked capillaries showed significant association with duration of AN. Tortuous and crosslinked capillaries showed significant association with clinical scale of AN.

The present study helps in furthering the cause that early detection of microvascular changes in cases of AN (suggestive of insulin resistance) using nail fold capillaroscopy acts as a bedside, non-invasive procedure which can aid in referring the patient for screening of diabetic retinopathy, diabetic nephropathy at the earliest.

This study will also aid in monitoring the treatment in AN through dermoscopy with the help of the scoring system devised.

The limitations of this study were that nail folds under dermoscope were not seen in all patients and HOMA IR was not calculated for all .

More studies with a larger sample size and known insulin resistance status are required to strengthen the findings of this study.

SUMMARY

- In the present cross-sectional study purposive sampling was conducted among the patients attending the Dermatology OPD, KLE'S Dr Prabhakar Kore Hospital and Medical Research Centre, Belagavi during July 2022 to July 2023.
- All clinically diagnosed cases of Acanthosis nigricans were included in the study.
- Association between categorical variables was measured with Chi- square test
- Association between categorical variable and one continuous variable was measured with ANOVA test.
- P-value less than or equal to 0.05 was considered to be of statistical significance.
- The mean age of the patients who met the inclusion criteria in the current study was 26.46 years. Majority were in the age group 16-25 years(39.17%), followed by 26-35 years(17.52%)
- There were 60% females and 40% males among them, with a female to male ratio of 2.7.
- Duration of AN was < 5 years in 68.04% patients and ≥ 5 years in 31.95% patients.
- 63.38% of the females had irregular menstrual cycle.
- Acrochordons was the most common associated dermatological finding with a prevalence of 50.43%.
- Hirsutism was present in 15.49% females and hormonal patterned hair loss was seen in 27.83% of participants.

- 7.21% patients were known diabetics and 36 out of 97 patients who gave consent to get their HOMA IR done 21 had insulin resistance. (HOMA IR > 2). The HOMA IR value of other participants remained unknown.
- Most participants (51.54%) belonged to obese type I class (25.0 – 29.9 kg/ m²) according to the BMI Asian classification followed by obese type II class (≥ 30 kg/m²) 43.29%.
- Fitzpatrick skin type IV was the commonest (66%) in the present study followed by skin type III (24.7%).
- Neck was involved in all patients 100%, involvement of axilla was seen in 82.47% patients in the present study.
- The most common Burke's grade in neck severity seen was grade 3 - 48.5% followed by grade 4 - 36.1%.
- The most common Burke's grade in axilla seen was grade 3- 44.3% followed by grade 4 – 23.7%.
- The most common Burke's grade in neck texture seen was grade 3- 59.8% followed by grade 2 - 27.8%
- The most common dermoscopy finding in AN was sulci cutis (100%). The second most common was cristi cutis (97.93%), followed by papillary projections (96.90%), followed by hyperpigmented dots/globules (56.70%). The least common finding was white streaks/globules (6.18%).
- Nail fold capillaries on capillaroscopy were not visible in 14/97 (14.43%) patients.
- The most common nailfold capillaroscopy finding was dropouts (100%) followed by tortuous capillaries (73.49%), followed by cross linked capillaries (66.26%) ,followed

by ramified capillaries (31.32%). Least common findings were haemorrhage and ectasia (7.22%) each.

- Sulci cutis, cristi cutis, papillary projections, hyperpigmented blotches, crypts showed significant association with Burke's clinical grade of AN (all three parameters- neck severity, neck axilla, neck texture).
- Sulci cutis, cristi cutis, hyperpigmented dots, colour of hyperpigmented dots, crypts of neck and bilateral axilla had a significant association with duration of AN.
- Tortuous capillaries showed significant association (p value <0.05) with Burke's clinical grade of AN (neck severity, neck texture). Cross linked capillaries showed significant association (p value <0.05) with Burke's clinical grade of AN (neck severity, neck texture, axilla)
- Cross linked (p value- 0.001) and ramified capillaries (p value – 0.003) had significant association with duration of AN.

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ANNEXURE I – INFORMED CONSENT FORM

**Title of the study: “Study of association of clinical and dermoscopic findings with nailfold capillaroscopy changes in acanthosis nigricans: a one year crosssectional study at a tertiary care hospital.” attending KLE’s Dr Prabhakar Kore
Hospital & MRC, Belagavi.**

NAME OF STUDENT/PRINCIPAL INVESTIGATOR:

NAME OF GUIDE/CO INVESTIGATOR:

OBJECTIVE:

Primary objective: To study the association of clinical and dermoscopic findings with nailfold capillaroscopy changes in Acanthosis Nigricans.

Secondary objective: To understand the spectrum of nail fold capillaroscopy changes in patients of Acanthosis Nigricans.

INTRODUCTION:

Acanthosis nigricans is a commonly found condition but is often neglected. It presents as by darkening and thickening of skin with a velvety texture.

The patients present with this condition for cosmetic purposes. As a number of systemic disorders are associated with this condition, it's detection becomes necessary.

EXPLANATION OF PROCEDURE: Dermoscopy will be done on an affected areas and nail fold capillaroscopy will be done on nails both non invasive investigations. Both will be done by a dermoscope which is like magnifying glass.

WITHDRAWAL FROM PARTICIPATION IN THE STUDY: Participation in this study is voluntary. You will be free to decide whether to participate in this study or continue participation once enrolled. In case you decide to withdraw your participation, you are free to do so. However, please convey the decision to the principal investigator.

POSSIBLE BENEFITS FROM PARTICIPATING IN THE STUDY: You will/will not have nor get any benefits by participating in this study. The data gathered will help the population at large.

POSSIBLE RISKS FROM PARTICIPATING IN THE STUDY: There are no risks involved in participating in this study.

PRIVACY AND CONFIDENTIALITY: The information collected from you will be

coded, to prevent any person from identifying you. Your identity will never be revealed. The data collected from you will be kept confidential and only processed or aggregated data will be used for publication.

FINANCIAL INCENTIVES: You will not receive any payment for participating in this study.

Authorization for publication of aggregated data: results obtained after processing of the aggregated data will be published for scientific purposes and or presented to scientific groups. However, your identity will never be revealed.

QUESTIONS: In case of any questions with regard to this study, you are free to contact:

right as study participant you may contact Dr Harsha Hegde, Chairperson, ethical committee of JNMC, 0831-2473777 extension 4052.

LEGAL RIGHTS: By signing this consent form, we are not waving any of your legal rights.

CONSENT STATEMENT

I am making a voluntary decision to participate in the study “Study of association of clinical and dermoscopic findings with nailfold capillaroscopy changes in acanthosis nigricans: a one year cross-sectional study at a tertiary care hospital.”. My signature below indicates that I have decided to participate and I have read the information provided above or the information provided above has been read to me in the language that I understand best. I was given the opportunity to ask questions and that they have been answered to my satisfaction.

Name of the participant:

Signature or left thumb impression of the participant:

Name of the witness:

Signature or left thumb impression of the witness:

Name of the investigator:

Signature of the investigator:

INFORMED PAEDIATRIC CONSENT

STATEMENT OF ASSENT -

I ,Mr / Ms/ Mrs Parent
/ guardian of consent to enroll my daughter / son to
participate in this study “**Study of association of clinical and dermoscopic findings
with nailfold capillaroscopy changes in acanthosis nigricans: a one year
crosssectional study at a tertiary care hospital.**”.I have read the consent document or it
has been read to me in my vernacular language . I give my acceptance on behalf of my
daughter/son for his/her participation in the study. All the information regarding this study
is provided to me and I have understood the same. I have been given the opportunity to
ask questions and obtain appropriate answers

Participant`s name :

Participant`s Parent / Guardian name :

Signature or left thumb print of parent / guardian of participant :

Witness name:

Signature of witness

Signature of the investigator

Date :

ANNEXURE - II- PROFORMA

PROFORMA

Study: "Study of association of clinical and dermoscopic findings with nailfold capillaroscopy changes in acanthosis nigricans: a one year cross-sectional study at a tertiary care hospital"

Demographic details					
Name			Marital status		
Age			Gender		
Occupation			Case number		
Address	Urban	Rural	Op number		
Contact no.			Ip number		
Pregnant	Yes	No	Lactation	Yes	No

Diagnosis

Chief complaints

Associated symptoms		
Weight gain	Yes	No
Menstrual complaints		
Periods	Regular	Irregular
Hirsutism	Yes	No

Annexures

Female pattern hair loss/male pattern hair loss	Yes	No
Skin tags	Yes	No
Fitzpatrick skin type		

Number of sites involved	Single	Multiple
--------------------------	--------	----------

Site	Neck	Axilla	Face	Groin	Acral	Others
------	------	--------	------	-------	-------	--------

Age of onset			
Onset	Gradual	Sudden	
Duration			
Progression	Progressive	Stationary	

Similar complaints in family	Yes	No
------------------------------	-----	----

Any drug intake	Yes	No
Antidiabetic drug	Yes	No
Oral contraceptive pills	Yes	No

Past history		
DM	Yes	No
HTN	Yes	No
Hypercholesterolemia	Yes	No
Malignancy	Yes	No
Any other skin condition	Yes	No
Rheumatological conditions like Scleroderma, Systemic lupus Erythematosus, Dermatomyositis	Yes	No
Alopecia areata ,Psoriasis	Yes	No

Personal history		
Smoking	Yes	No
Alcohol	Yes	No

Anthropometric measurements	
Height	
Weight	
BMI	

Burke grading for acanthosis nigricans

Neck severity		
0	Absent: Not detectable on close inspection	
1	Present: Clearly present on close visual inspection, not visible to the casual observer, extent not measurable	
2	Mild: Limited to the base of the skull, does not extend to the lateral margins of the neck (usually ,3 inches in breadth)	
3	Moderate: Extending to the lateral margins of the neck (posterior border of the sternocleidomastoid) (usually 3–6 inches), should not be visible when the participant is viewed from the front	
4	Severe: Extending anteriorly (.6 inches), visible when the participant is viewed from the front	
Axilla		
0	Absent: Not detectable on close inspection	
1	Present: Clearly present on close visual inspection, not visible to the casual observer, extent not measurable.	
2	Mild: localized to the central portion of the axilla, may have gone unnoticed by the participant.	
3	Moderate: Involving entire axillary fossa, but not visible when the arm is against the participant 's side.	
4	Severe: Visible from front or back in the unclothed participant when the arm is against the participant 's side	
Neck texture		
0	Smooth to touch: No differentiation from normal skin to palpation.	
1	Rough to touch: Clearly differentiated from normal skin	
2	Coarseness can be observed visually, portions of the skin clearly raised above other areas	
3	Extremely coarse: “hills and valleys” observable on visual examination	

Knuckle		
Present		
Absent		
Elbow		
Present		
Absent		
Knee		
Present		
Absent		

Metabolic parameters	Values
Fasting insulin level	
Fasting glucose level	
Homa IR	

Sulci cutis 0-Absent 1- Not prominent 2-Prominent

Cristi cutis 0- Absent - Rhomboid formation absent. 1-Rhomboid formation present

Papillary projections 0- Absent 1 - <50 2- >50

Hyperpigmented dots / globules 0-Absent 1-Dots 2- Globules

Color of hyperpigmented dots 0-Absent 1-Light brown 2- Dark brown

Hyperpigmented blotches 0- Absent 1- Present

Crypts 0-Absent 1- Present

White globules and streaks 0- Absent 1- Present

Clinical findings/ Burke's grading site 1	Dermoscopy findings site 1	Nail fold capillaroscopy				
	Sulci cutis					

	Cristi cutis					
	Papillary projections	Drop outs	1 st rt	2 nd rt	1 st lt	2 nd lt
	Hyperpigmented Dots/globules	Tortuous capillaries	1 st rt	2 nd rt	1 st lt	2 nd lt
	Colour of hyperpigmented dots	Cross linked capillaries	1 st rt	2 nd rt	1 st lt	2 nd lt
	Hyperpigmented blotches.	Giant capillaries	1 st rt	2 nd rt	1 st lt	2 nd lt
	Crypts	Haemorrhage	1 st rt	2 nd rt	1 st lt	2 nd lt
	White globules /streaks	Ramified capillaries	1 st rt	2 nd rt	1 st lt	2 nd lt

		Ectasia	1 st rt	2 nd rt	1 st lt	2 nd lt
Clinical features site 2	Dermoscopy findings site 2					
	Sulci cutis	Drop outs	3 rd rt		3 rd lt	
	Cristi cutis	Tortuous capillaries	3 rd rt		3 rd lt	
	Papillary projections	Cross linked capillaries	3 rd rt		3 rd lt	
	Hyperpigmented Dots	Giant capillaries	3 rd rt		3 rd lt	
	Colour of hyperpigmented dots	Ramified capillaries	3 rd rt		3 rd lt	

	Hyperpigmented blotches.	Haemorrhage	3 rd rt		3 rd lt	
	Crypts	Ecstasia	3 rd rt		3 rd lt	
	White globules /streaks					
Clinical features Site 3	Dermoscopy findings site 3					
	Sulci cutis	Drop outs	4 th rt	5 th rt	4 th lt	5 th lt
	Cristi cutis	Tortuous capillaries	4 th rt	5 th rt	4 th lt	5 th lt
	Papillary projections	Cross linked capillaries	4 th rt	5 th rt	4 th lt	5 th lt
	Hyperpigmented Dots	Giant capillaries	4 th rt	5 th rt	4 th lt	5 th lt
	Colour of hyperpigmented dots	Ramified capillaries	4 th rt	5 th rt	4 th lt	5 th lt

	Hyperpigmented blotches.	Haemorrhage	4 th rt	5 th rt	4 th lt	5 th lt
	Crypts	Ecstasia	4 th rt	5 th rt	4 th lt	5 th lt
	White globules /streaks					

Dermoscopy grading : Site 1 (neck)

	Dermoscopy findings	0	1	2
1.	Sulci cutis	Absent	Prominent	Not Prominent
2.	Cristi cutis	Absent	Rhomboid formation present	Rhomboid formation absent
3.	Papillary projections	Absent	Non-triangular	Triangular
4.	Hyperpigmented dots	Absent	<50	>50
5.	Colour (of dots and globules)	Absent	Dark brown	Light brown
6.	Blotches	Absent	Present	
7.	Crypts	Absent	Present	
8.	White streaks/globules	Absent	Present	

Dermoscopy grading : Site 2 (Right axilla)

	Dermoscopy findings	0	1	2
1.	Sulci cutis	Absent	Prominent	Not Prominent
2.	Cristi cutis	Absent	Rhomboid formation present	Rhomboid formation absent
3.	Papillary projections	Absent	Non-triangular	Triangular
4.	Hyperpigmented dots	Absent	<50	>50
5.	Colour (of dots and globules)	Absent	Dark brown	Light brown
6.	Blotches	Absent	Present	
7.	Crypts	Absent	Present	
8.	White streaks/globules	Absent	Present	

Dermoscopy grading : Site 3 (Left axilla)

	Dermoscopy findings	0	1	2
1.	Sulci cutis	Absent	Prominent	Not Prominent
2.	Cristi cutis	Absent	Rhomboid formation present	Rhomboid formation absent
3.	Papillary projections	Absent	Non-triangular	Triangular
4.	Hyperpigmented dots	Absent	<50	>50
5.	Colour (of dots and globules)	Absent	Dark brown	Light brown
6.	Blotches	Absent	Present	
7.	Crypts	Absent	Present	
8.	White streaks/globules	Absent	Present	

Nail fold capillaroscopy grading (done on B/L 4th and 5th fingernail)

	Nail fold capillaroscopy changes	0	1
1.	Drop outs	Absent	Present
2.	Tortuous capillaries	Absent	Present
3.	Crosslinked capillaries	Absent	Present

4.	Giant capillaries	Absent	Present
5.	Haemorrhage	Absent	Present
6.	Ramified capillaries	Absent	Present
7.	Ectasia	Absent	Present

ANNEXURE III – PHOTOGRAPHS**ANNEXURE III - PHOTOGRAPHS****Figure 20a****Figure 20b****Figure 20c****Figure 20d**



Figure 20e

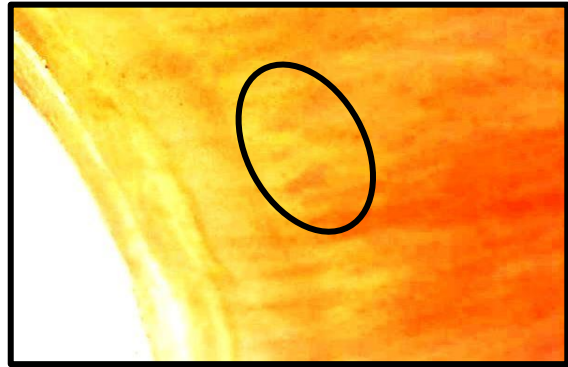


Figure 20f

Case 1

65 Y/F, Duration of AN-2, Burke's grading Neck severity 3, Neck texture 2, Axilla 2

Figure 20a- Involvement of neck, Burke's grading Neck severity 3, Neck texture 2

Figure 20b – Involvement of axilla, Burke's grading Axilla 2

Figure 20c – Dermoscopy of neck: Sulci cutis – Not prominent

(Non-polarised mode) Crista cutis- Rhomboid formation absent

(80 X magnification) Papillary projections- Triangular

Figure 20d – Dermoscopy of axilla: Sulci cutis – Not prominent

(Non-polarised mode) Crista cutis- Rhomboid formation absent

(80 X magnification) Papillary projections- Absent

Figure 20e – Nailfold capillaroscopy– Crosslinked capillary

(Polarised mode 80X magnification)

Figure 20f - Nailfold capillaroscopy (Polarised mode)– Drop outs

(Polarised mode 80X magnification)



Figure 21a



Figure 21b

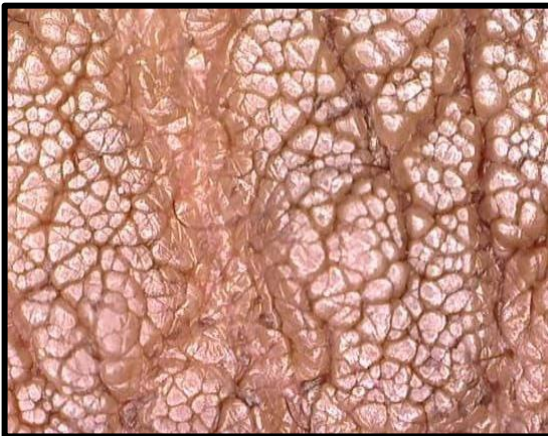


Figure 21c

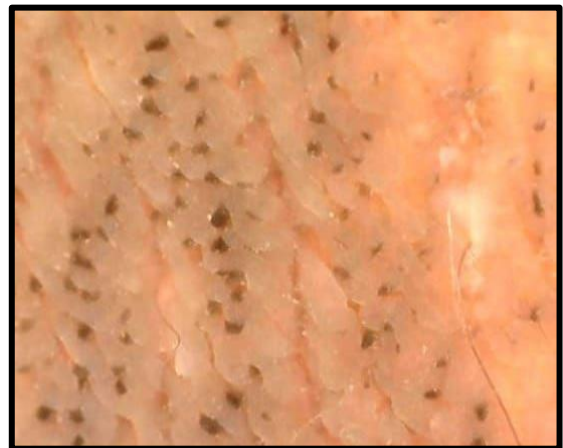


Figure 21d

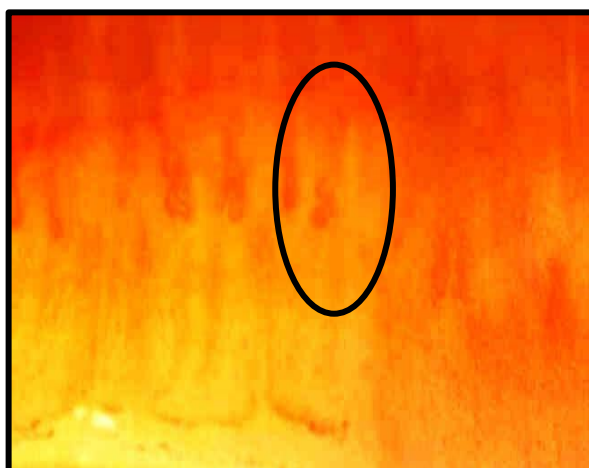


Figure 21e

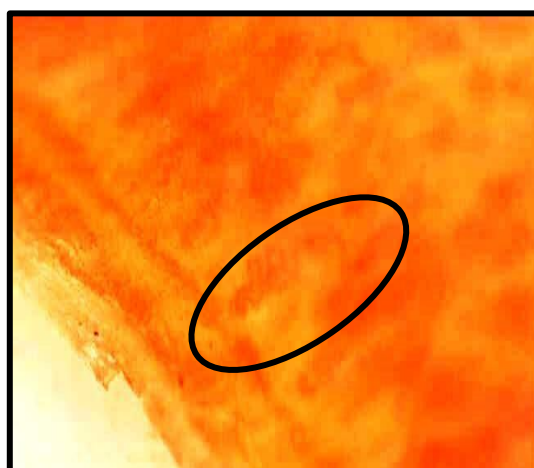


Figure 21f

Case 2: 35 Y/M, Duration of AN 8, Burke's grading Neck severity 4, Neck texture 3, Axilla 4

Figure 21a- Involvement of neck, Burke's grading Neck severity 4, Neck texture 3

Figure 21b – Involvement of axilla, Burke's grading Axilla 4

Figure 21c – Dermoscopy of neck: Sulci cutis – Prominent

(Non-polarised mode) Crista cutis- Rhomboid formation present

(80X magnification) Papillary projections- Non-triangular

Hyperpigmented dots - <50 in number

Figure 21d – Dermoscopy of axilla: Sulci cutis – Prominent

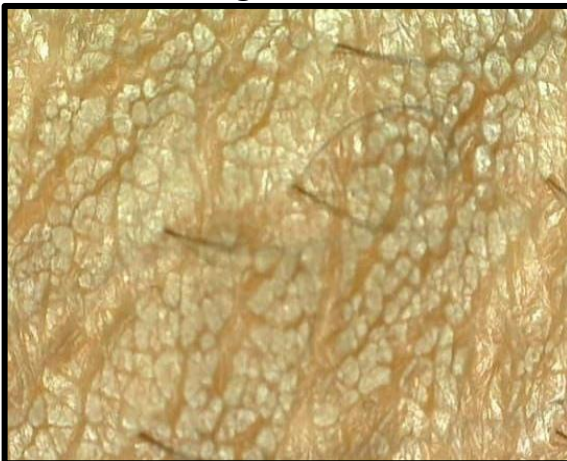
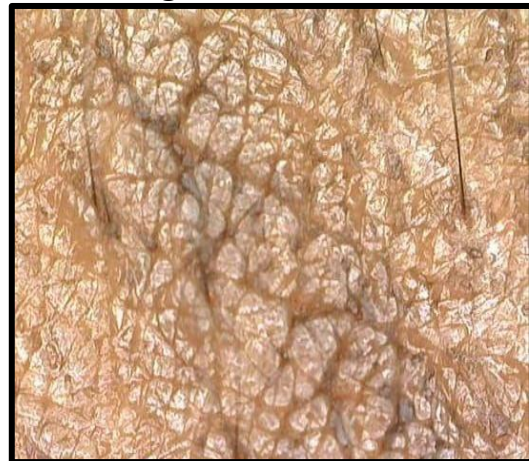
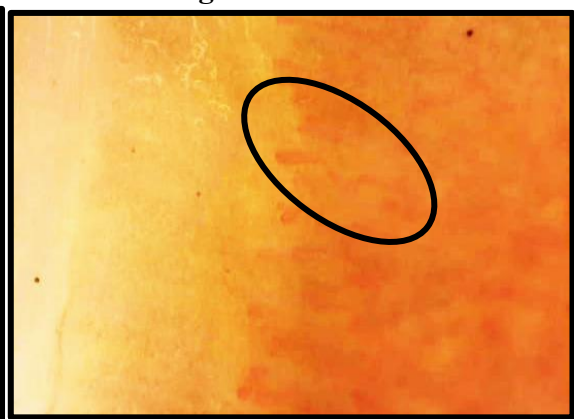
(Polarised mode) Crista cutis- Rhomboid formation present

(80X magnification) Papillary projections- Non-triangular

Hyperpigmented dots - > 50 in number

Figure 21e – Nailfold capillaroscopy – Tortuous capillary

(Polarised mode 80X magnification)

Figure 21f - Nailfold capillaroscopy – Ramified capillary**(Polarised mode 170X magnification)****Figure 22a****Figure 22b****Figure 22c****Figure 22d****Figure 22e****Figure 22f**

Case 3: 19Y/F, Duration of AN 2, Burke's grading Neck severity 3, Neck texture 2, Axilla 3

Figure 22a- Involvement of neck, Burke's grading Neck severity 3, Neck texture 2

Figure 22b – Involvement of axilla, Burke's grading Axilla 3

Figure 22c – Dermoscopy of neck: Sulci cutis – Prominent

(Non-polarised mode)	Cristi cutis- Rhomboid formation present
(80 X magnification)	Papillary projections- Non – triangular

Figure 22d – Dermoscopy of axilla: Sulci cutis – Prominent

(Non-polarised mode)	Cristi cutis- Rhomboid formation present
(80 X magnification)	Papillary projections- Non-triangular
	Hyperpigmented dots - < 50 in number

Figure 22e – Nailfold capillaroscopy– Tortuous capillary

(Polarised mode 80X magnification)

Figure 22f - Nailfold capillaroscopy–Crosslinked capillary

(Polarised mode 80X magnification)

ANNEXURE IV - KEY TO MASTER CHART

Y – YES

N - NO

NA- NOT APPLICABLE

NI – NOT INVOLVED

NV- NOT VISIBLE

P – PRESENT

A - ABSENT

RA- RIGHT AXILLA

LA- LEFT AXILLA

SR NO	NAME	AGE	SEX	MARITAL STATUS	OCCUPATION	ADDRESS	PREGNANT	LACTATION	WEIGHT GAIN	WEIGHT LOSS	PERIODS	HIRUTISM	FEMALE/MALE PATTERN HAIR LOSS	SKIN TAGS	NUMBER OF SITES INVOLVED	SITE OF AN	SITE OF AN	AGE OF ONSET (YRS)	DURATION(YRS)	ANTI DIABETIC DRUG	DM	HTN	HYPERCHOLESTROLEMIA	HEIGHT(M)	WEIGHT(KG)	BMI	FITZPATRICK SKIN TYPE	FASTING INSULIN	FASTING GLUCOSE	HOMA IR	BURKE'S GRADE NECK SEVERITY	BURKE'S NECK TEXTURE	SULCI CUTIS (N)	CRISTI CUTIS (N)	PAPILLARY PROJECTIONS (N)	HYPERPIGMENTED DOTS/GLOBULES <50 or >50 (N)	COLOUR OF HYPERPIGMENTED DOTS (N)	HYPERPIGMENTED BLOTCHES (N)	CRYPTS(N)	WHITE STREAKS/GLOBULES(N)	BURKE'S GRADE AXILLA	SULCI CUTIS (RA)	CRISTI CUTIS(RA)	PAPILLARY PROJECTIONS(RA)	
1	MALA	17	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	N	N	MULTIPLE	NECK	AXILLA	15	2	N	N	N	N	N	1.5	61	27.1	3				3	3	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	2	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR
2	RAJU	35	M	MARRIED	BUSINESS	URBAN	NA	NA	Y	N	NA	NA	N	>5	MULTIPLE	NECK	AXILLA	27	8	N	N	N	N	1.74	105	34.7	5				4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	> 50	DARK BROWN	PRESENT	PRESENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
3	ZAREENHAVIN	29	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	REGULAR	N	N	<5	MULTIPLE	NECK	AXILLA	25	4	N	N	N	N	1.55	70	29.1	3				3	3	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	> 50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
4	ISHAD	21	F	UNMARRIED	STUDENT	URBAN	N	N	N	N	IRREGULAR	N	N	>5	MULTIPLE	NECK	AXILLA	18	3	N	N	N	N	1.57	63	25.6	3				2	1	PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION ABSENT	CIRCULAR	
5	DNYANESHWAR	35	M	MARRIED	CLERK	RURAL	NA	NA	Y	N	NA	NA	N	>5	MULTIPLE	NECK	AXILLA	32	3	N	N	N	N	1.7	90	29.8	4	25.2	88	5.47	4	1	PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR		
6	ANA PIEDADE	56	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	IRREGULAR	N	N	N	MULTIPLE	NECK	AXILLA	54	2	N	N	N	N	1.61	78	30.1	3				3	2	PROMINENT	RHOMBOID FORMATION ABSENT	ABSENT	> 50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	1	PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	
7	APURVA	22	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	Y	GRADE 1	N	MULTIPLE	NECK	AXILLA	16	6	N	N	N	N	1.56	66	27.1	2	31.3	95	7.3	3	3	PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	>50	DARK BROWN	PRESENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	
8	POOJA	43	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	REGULAR	N	N	<5	SINGLE	NECK	NI	40	3	N	N	N	N	1.57	92	38	4				2	1	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	<50	DARK BROWN	ABSENT	ABSENT	ABSENT	1	ABSENT	ABSENT	ABSENT	
9	JANICE	10	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	N	N	MULTIPLE	NECK	AXILLA	7	3	N	N	N	N	1.35	46	25.8	5	49	97	11.74	4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION ABSENT	CIRCULAR	
10	RAKSHITA	21	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	N	N	MULTIPLE	NECK	AXILLA	16	5	N	N	N	N	1.61	87	33.1	3				4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	ABSENT	ABSENT	1	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR		
11	NEEDA	18	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	REGULAR	N	N	N	MULTIPLE	NECK	AXILLA	14	4	N	N	N	N	1.58	70	28	4				4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
12	SUNIL	28	M	MARRIED	BUSINESS	URBAN	NA	NA	Y	N	NA	NA	N	N	MULTIPLE	NECK	AXILLA	25	3	N	N	N	N	1.6	75	29.3	4				3	2	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	
13	DAVANAND	32	M	MARRIED	SHOP OWNER	RURAL	NA	NA	Y	N	NA	NA	N	N	SINGLE	NECK	NI	29	3	N	N	N	N	1.62	75	28.6	4				2	1	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	NI	NI	NI	NI	
14	SALIM	45	M	MARRIED	SHOP OWNER	URBAN	NA	NA	N	N	NA	NA	N	<5	MULTIPLE	NECK	AXILLA	40	5	N	N	N	N	1.67	90	32.3	4				4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	ABSENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
15	JESSICA	15	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	N	>5	MULTIPLE	NECK	AXILLA	10	5	N	N	N	N	1.43	65	31.8	4				4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	4	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
16	SANIYA	17	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	GRADE 2	<5	MULTIPLE	NECK	AXILLA	13	4	N	N	N	N	1.54	60	25.3	4	32.9	91	7.4	4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	LIGHT BROWN	PRESENT	PRESENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
17	SANA	24	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	GRADE 1	>5	MULTIPLE	NECK	AXILLA	22	2	N	N	N	N	1.54	60	25.3	4				3	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
18	SHREYA	19	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	Y	N	<5	MULTIPLE	NECK	AXILLA	17	2	N	N	N	N	1.57	63	25.6	3				3	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
19	CHANDRAKALA	42	F	MARRIED	HOUSEWIFE	RURAL	N	N	Y	N	REGULAR	N	N	<5	MULTIPLE	NECK	AXILLA	43	2	Y	Y	N	N	1.53	65	27.8	4				3	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	PRESENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION ABSENT	ABSENT	
20	LAXMI	13	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	NA	N	N	N	MULTIPLE	NECK	AXILLA	10	3	N	N	N	N	1.41	63	31.7	4				4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
21	ANAND	52	M	MARRIED	TEACHER	RURAL	NA	NA	Y	N	NA	NA	N	N	MULTIPLE	NECK	AXILLA	47	5	Y	Y	Y	N	1.76	78	25.24	4				3	3	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	
22	PRATHAMESH	23	M	UNMARRIED	STUDENT	URBAN	NA	NA	Y	N	NA	NA	N	N	MULTIPLE	NECK	NI	22.5	0.5	N	N	N	N	1.75	90	29.4	3				1	1	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	NI	NI	NI	NI	
23	ROOPA	26	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	REGULAR	N	GRADE 2	>5	MULTIPLE	NECK	AXILLA	24	2	N	N	N	N	1.54	70	29.53	4	29.8	94	6.9	4	2	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	3	NOT PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
24	SHIVAPPA	50	M	MARRIED	CLERK	RURAL	NA	NA	Y	N	NA	NA	N	<5	MULTIPLE	NECK	AXILLA	25	1	N	N	N	N	1.75	75	24.5	4				3	2	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	3	PROMINENT	RHOMBOID FORMATION ABSENT	ABSENT	
25	RANJANA	24	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	REGULAR	N	N	N	MULTIPLE	NECK	AXILLA	23	1	N	N	N	N	1.57	64	26	3				3	2	PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	2	ABSENT	ABSENT	CIRCULAR	
26	LORETTA	46	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	IRREGULAR	N	Y	>5	SINGLE	NECK	NI	43	3	N	N	N	N	1.57	65	26	4				3	3	PROMINENT	ABSENT	CIRCULAR	<50	DARK BROWN	PRESENT	ABSENT	ABSENT	ABSENT	NI	NI	NI	NI
27	KALPANA	32	F	MARRIED	ENGINEER	URBAN	N	N	Y	N	IRREGULAR	N	N	N	SINGLE	NECK	NI	29	3	N	Y	N	N	1.48	74	35	4				3	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	NI	NI	NI	NI	
28	SHOBHA	27	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	IRREGULAR	N	N	N	MULTIPLE	NECK	AXILLA	25	2	N	N	N	N	1.54	70	29.5	3				3	2	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	2	NOT PROMINENT	ABSENT	ABSENT	
29	SAVITRI KOPARDE	65	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	MENOPAUSE	N	N	>5	MULTIPLE	NECK	AXILLA	63	2	N	N	N	N	1.6	81	31.6	4				3	2	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	2	NOT PROMINENT	ABSENT	ABSENT	
30	MAHANTESH	32	M	MARRIED	BUSINESS	URBAN	NA	NA	Y	N	NA	NA	N	>5	MULTIPLE	NECK	AXILLA	25	7	N	N	N	N	1.65	90	33.1	4	33.9	98	8.2	4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	<50	LIGHT BROWN	ABSENT	PRESENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	
31	BHAGYALAXMI	18	F	MARRIED	STUDENT	URBAN</																																							

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68	SRUSHTI	25	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	REGULAR	N	N	N	N	N	1.58	70	28	4					4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR
69	ANIL	31	M	MARRIED	BUSINESS	URBAN	NA	NA	Y	N	NA	NA	N	N	MULTIPLE	NECK	AXILLA	28	3	N	N	N	N		3	2	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR
70	LANCY	34	M	MARRIED	SHOP OWNER	RURAL	NA	NA	Y	N	NA	NA	N	N	SINGLE	NECK	NI	31	3	N	N	N	N		2	1	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	NI	NI	NI	NI
71	SACHIN	42	M	MARRIED	SUPERVISOR	URBAN	NA	NA	N	N	NA	NA	N	<5	MULTIPLE	NECK	AXILLA	37	5	N	N	N	N		4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	ABSENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR
72	MOHAMMED	50	M	MARRIED	BUSINESS	RURAL	NA	NA	Y	N	NA	NA	N	N	MULTIPLE	NECK	AXILLA	45	5	Y	Y	Y	N		3	3	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR
73	PRAKASH	25	M	UNMARRIED	STUDENT	URBAN	NA	NA	Y	N	NA	NA	N	N	MULTIPLE	NECK	NI	24.5	0.5	N	N	N	N		1	1	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	NI	NI	NI	NI
74	JAYA	28	F	MARRIED	ENGINEER	URBAN	N	N	Y	N	REGULAR	N	GRADE 2	>5	MULTIPLE	NECK	AXILLA	26	2	N	N	N	N				PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	3	NOT PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR
75	SHIVANGOLUDA	52	M	MARRIED	CLERK	RURAL	NA	NA	Y	N	NA	NA	N	<5	MULTIPLE	NECK	AXILLA	51	1	N	N	N	N		3	2	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	3	PROMINENT	RHOMBOID FORMATION ABSENT	ABSENT
76	RACHANA	26	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	REGULAR	N	N	N	MULTIPLE	NECK	AXILLA	25	1	N	N	N	N		3	2	PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	2	ABSENT	ABSENT	CIRCULAR
77	FATIMA	49	F	MARRIED	PEON	URBAN	N	N	Y	N	IRREGULAR	N	Y	>5	SINGLE	NECK	NI	46	3	N	N	N	N		3	3	PROMINENT	ABSENT	CIRCULAR	<50	DARK BROWN	PRESENT	ABSENT	ABSENT	NI	NI	NI	NI
78	SANJANA	34	F	MARRIED	ENGINEER	URBAN	N	N	Y	N	IRREGULAR	N	N	N	SINGLE	NECK	NI	31	3	N	Y	N	N		3	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	NI	NI	NI	NI
79	SHEELA	24	F	MARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	N	N	MULTIPLE	NECK	AXILLA	22	2	N	N	N	N		3	2	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	2	NOT PROMINENT	ABSENT	ABSENT
80	SAVITA	67	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	MENOPAUS E	N	N	>5	MULTIPLE	NECK	AXILLA	65	2	N	N	N	N		3	2	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	2	NOT PROMINENT	ABSENT	ABSENT
81	DAREPPA	30	M	MARRIED	BUSINESS	URBAN	NA	NA	Y	N	NA	NA	N	>5	MULTIPLE	NECK	AXILLA	23	7	N	N	N	N				PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	<50	LIGHT BROWN	ABSENT	PRESENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR
82	BHAGYA	20	F	MARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	GRADE 2	N	MULTIPLE	NECK	AXILLA	18	2	N	N	N	N		3	2	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	3	PROMINENT	ABSENT	ABSENT
83	JAYLAXMI	63	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	MENOPAUS E	N	N	N	SINGLE	NECK	NI	61	2	N	N	N	N		3	2	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	NI	NI	NI	NI
84	KEERTANA	20	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	REGULAR	N	GRADE 1	N	MULTIPLE	NECK	AXILLA	18	2	N	N	N	N		3	2	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION ABSENT	CIRCULAR
85	NEETA	24	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	Y	GRADE 2	N	MULTIPLE	NECK	AXILLA	18	6	N	N	N	N		3	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	<50	<50	PRESENT	PRESENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION ABSENT	CIRCULAR
86	CHANDRABHAGA	46	F	MARRIED	HOUSEWIFE	RURAL	N	N	Y	N	REGULAR	N	N	<5	SINGLE	NECK	NI	44	2	N	N	N	N		2	2	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	NI	NI	NI	NI
87	SAYMA	43	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	REGULAR	N	GRADE 2	>5	MULTIPLE	NECK	AXILLA	37	6	N	N	N	N		4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	<50	DARK BROWN	PRESENT	PRESENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION ABSENT	CIRCULAR
88	POORNA	36	F	MARRIED	TECHNICIAN	URBAN	N	N	Y	N	REGULAR	N	N	<5	SINGLE	NECK	NI	34	2	N	N	N	N		2	2	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	NI	NI	NI	NI
89	RAJESHWARI	21	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	N	N	MULTIPLE	NECK	AXILLA	16	5	N	N	N	N				PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	<50	ABSENT	ABSENT	PRESENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR
90	SIBU	22	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	GRADE 2	<5	MULTIPLE	NECK	AXILLA	17	5	N	N	N	N				PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION PRESENT	ABSENT
91	MUTTAGOLUDA	47	M	MARRIED	BUSINESS	URBAN	NA	NA	Y	N	NA	NA	GRADE 2	>5	MULTIPLE	NECK	AXILLA	43	4	N	N	N	N				PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	<50	DARK BROWN	PRESENT	ABSENT	ABSENT	4	PROMINENT	ABSENT	CIRCULAR
92	REVATI	17	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	Y	N	N	MULTIPLE	NECK	AXILLA	12	5	N	N	N	N		3	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR
93	MONISHA	21	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	Y	GRADE 1	>5	MULTIPLE	NECK	AXILLA	16	5	N	N	N	N		3	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	3	PROMINENT	RHOMBOID FORMATION ABSENT	CIRCULAR
94	SALMA	16	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	N	N	MULTIPLE	NECK	AXILLA	14	2	N	N	N	N		2	2	PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	<50	DARK BROWN	PRESENT	ABSENT	ABSENT	3	PROMINENT	ABSENT	CIRCULAR
95	MITA	39	F	MARRIED	HOUSEWIFE	URBAN	N	N	Y	N	REGULAR	N	GRADE 1	>5	MULTIPLE	NECK	AXILLA	29	10	Y	Y	Y	N		4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	<50	DARK BROWN	PRESENT	PRESENT	ABSENT	3	PROMINENT	ABSENT	CIRCULAR
96	SULOCHANA	16	F	UNMARRIED	STUDENT	URBAN	N	N	Y	N	IRREGULAR	N	N	N	MULTIPLE	NECK	AXILLA	12	4	N	N	N	N		4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	<50	DARK BROWN	PRESENT	PRESENT	ABSENT	4	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR
97	BABAN	51	M	MARRIED	BUSINESS	URBAN	NA	NA	Y	N	NA	NA	N	>5	MULTIPLE	NECK	AXILLA	48	3	N	N	N	N		4	3	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	3	PROMINENT	ABSENT	CIRCULAR

HYPERPIGMENTED DOTS/GLOBULES(RA)	COLOUR OF HYPERPIGMENTED DOTS(RA)	HYPERPIGMENTED BLOTCHES(RA)	CRYPTS(RA)	WHITE STREAKS/GLOBULES(RA)	SULCI CUTIS (LA)	CRISTI CUTIS (LA)	PAPILARY PROJECTIONS(LA)	HYPERPIGMENTED DOTS/GLOBULES(LA)	COLOUR OF HYPERPIGMENTED DOTS(LA)	HYPERPIGMENTED BLOTCHES(LA)	CRYPTS(LA)	WHITE STREAKS AND GLOBULES(LA)	NFC1ST RT	DROP OUTS	TORTUROUS CAPILLARIES	CROSS LINKED CAPILLARIES	GIANT CAPILLARIES	HAEMORRHAGE	RAMIFIED CAPILLARIES	ECTASIA	NFC 2ND RT	DROP OUTS	TORTUROUS CAPILLARIES	CROSS LINKED CAPILLARIES	GIANT CAPILLARIES	HAEMORRHAGE	RAMIFIED CAPILLARIES	ECTASIA	NFC 3RD RT	DROP OUTS	TORTUROUS CAPILLARIES	CROSS LINKED CAPILLARIES	GIANT CAPILLARIES	HAEMORRHAGE
ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	NOT PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	P	A	A	P	A

>50	DARK BROWN	ABSENT	PRESENT	ABSENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	ABSENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A	A			P	A	P	A	A	A
>50	DARK BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		A	P	A	A	A	A	A	A			P	A	A	A	A	A
<50	DARK BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION ABSENT	CIRCULAR	<50	DARK BROWN	ABSENT	ABSENT	ABSENT		P	P	A	A	A	A	A		P	P	A	A	A	A	A	A			P	A	A	A	A	A
<50	DARK BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	<50	DARK BROWN	ABSENT	ABSENT	ABSENT		P	P	A	A	A	A	A		P	A	A	A	A	A	A	A			P	P	A	A	A	A
<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION ABSENT	TRIANGULAR	<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A	A			P	P	P	A	A	A
>50	DARK BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	ABSENT	ABSENT	ABSENT		P	P	P	P	A	A	A		P	P	P	A	A	A	A	A			P	P	A	A	A	A
ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV			P	A	A	A	A	A
>50	DARK BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION ABSENT	CIRCULAR	>50	DARK BROWN	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV			P	P	A	A	A	A
>50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	LIGHT BROWN	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV			P	P	A	A	A	A
>50	DARK BROWN	ABSENT	PRESENT	ABSENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	ABSENT	PRESENT	ABSENT		P	A	A	A	A	A	A		P	P	A	A	A	A	A	A			P	A	A	A	A	A
>50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	>50	LIGHT BROWN	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV			P	P	P	A	A	A
NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		NV	NV	NV	NV	NV	NV	NV		P	A	A	A	A	A	A	A			P	P	P	A	A	A
>50	DARK BROWN	ABSENT	PRESENT	PRESENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	PRESENT	PRESENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			NV	NV	NV	NV	NV	NV	
>50	ABSENT	PRESENT	PRESENT	PRESENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	ABSENT	PRESENT	PRESENT	PRESENT		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A	A			P	P	P	A	A	A
>50	LIGHT BROWN	PRESENT	PRESENT	PRESENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	<50	LIGHT BROWN	PRESENT	PRESENT	PRESENT		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A	A			P	P	A	A	A	A
ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			P	P	P	A	A	A	
>50	DARK BROWN	PRESENT	PRESENT	ABSENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			P	P	P	A	A	A	
>50	DARK BROWN	PRESENT	PRESENT	ABSENT	PROMINENT	RHOMBOID FORMATION ABSENT	ABSENT	>50	DARK BROWN	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV			P	P	A	A	A	A
ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			P	A	A	A	A	A	
>50	DARK BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION PRESENT	TRIANGULAR	>50	DARK BROWN	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			P	A	A	A	A	A	
NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			NV	NV	NV	NV	NV	NV	
ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	NOT PROMINENT	RHOMBOID FORMATION ABSENT	CIRCULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A	A			P	A	A	A	A	A
ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			NV	NV	NV	NV	NV	NV	
ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	CIRCULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A	A			P	P	A	A	A	A
NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			P	P	P	A	A	A	
NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			P	P	A	A	A	A	
ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	NOT PROMINENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A	A			P	A	A	A	A	A
ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	NOT PROMINENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A	A			P	A	A	P	A	A
>50	DARK BROWN	ABSENT	PRESENT	ABSENT	PROMINENT	ABSENT	CIRCULAR	>50	DARK BROWN	ABSENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			P	P	P	A	A	A	
ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	PROMINENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			NV	NV	NV	NV	NV	NV	

	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	P	P	P	A	A			
>50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	NOT PROMINENT	ABSENT	CIRCULAR	>50	DARK BROWN	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	P	P	P	A	A			
>50	DARK BROWN	PRESENT	PRESENT	ABSENT	PROMINENT	ABSENT	CIRCULAR	>50	DARK BROWN	PRESENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	P	P	P	A	A			
NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		NV	NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A	A	P	A	A		
ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	PROMINENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV		
NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		NV	NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A	A	P	A	A		
>50	DARK BROWN	PRESENT	PRESENT	ABSENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	P	A	A	A	A		
<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	>50	LIGHT BROWN	ABSENT	ABSENT	PRESENT		P	P	P	A	A	A	A	A		P	P	P	A	A	A	P		P	P	A	A	A
>50	DARK BROWN	PRESENT	ABSENT	ABSENT	PROMINENT	ABSENT	CIRCULAR	>50	DARK BROWN	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	
>50	DARK BROWN	PRESENT	ABSENT	PRESENT	PROMINENT	ABSENT	CIRCULAR	>50	DARK BROWN	PRESENT	ABSENT	PRESENT		NV	NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	P	A		P	A	P	A	A
ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	PROMINENT	RHOMBROID FORMATION ABSENT	CIRCULAR	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	P	P	A	A	A	
<50	DARK BROWN	PRESENT	ABSENT	ABSENT	PROMINENT	ABSENT	CIRCULAR	<50	DARK BROWN	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	
>50	DARK BROWN	PRESENT	ABSENT	ABSENT	PROMINENT	ABSENT	ABSENT	>50	DARK BROWN	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	P	A		P	P	P	P	A
>50	DARK BROWN	PRESENT	PRESENT	PRESENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	PRESENT	PRESENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	P	P	A	P	A	A	
<50	DARK BROWN	PRESENT	ABSENT	ABSENT	PROMINENT	ABSENT	CIRCULAR	<50	DARK BROWN	PRESENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	P	A		P	A	P	P	A
ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	NOT PROMINENT	RHOMBROID FORMATION ABSENT	TRIANGULAR	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	P	A	A	P	A	A	
>50	DARK BROWN	ABSENT	PRESENT	ABSENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	ABSENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A		P	A	P	A	A
>50	DARK BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		A	P	A	A	A	A	A		P	A	A	A	A
<50	DARK BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBROID FORMATION ABSENT	CIRCULAR	<50	DARK BROWN	ABSENT	ABSENT	ABSENT		P	P	A	A	A	A	A	A		P	P	A	A	A	A	A		P	A	A	A	A
<50	DARK BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBROID FORMATION ABSENT	TRIANGULAR	<50	DARK BROWN	ABSENT	ABSENT	ABSENT		P	P	A	A	A	A	A	A		P	A	A	A	A	A	A		P	P	A	A	A
<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBROID FORMATION ABSENT	TRIANGULAR	<50	LIGHT BROWN	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A		P	P	P	A	A
>50	DARK BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	ABSENT	ABSENT	ABSENT		P	P	P	P	A	A	A	A		P	P	P	A	A	A	A		P	P	A	A	A
NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI		NV	NV	NV	NV	NV	NV	NV	NV		P	A	A	A	A	A	A		P	P	P	A	A
>50	DARK BROWN	ABSENT	PRESENT	PRESENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	PRESENT	PRESENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	
>50	ABSENT	PRESENT	PRESENT	PRESENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	>50	ABSENT	PRESENT	PRESENT	PRESENT		NV	NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A		P	P	P	A	A
>50	LIGHT BROWN	PRESENT	PRESENT	PRESENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	<50	LIGHT BROWN	PRESENT	PRESENT	PRESENT		NV	NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A		P	P	A	A	A
ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A
>50	DARK BROWN	PRESENT	PRESENT	ABSENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A
>50	LIGHT BROWN	ABSENT	ABSENT	ABSENT	PROMINENT	RHOMBROID FORMATION PRESENT	CIRCULAR	>50	LIGHT BROWN	ABSENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A
<50	DARK BROWN	PRESENT	ABSENT	ABSENT	PROMINENT	ABSENT	CIRCULAR	<50	DARK BROWN	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV

[illegible]

>50	DARK BROWN	PRESENT	ABSENT	PRESENT	PROMINENT	ABSENT	CIRCULAR	>50	DARK BROWN	PRESENT	ABSENT	PRESENT		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	P	A		P	A	P	A	A
ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	PROMINENT	RHOMBOID FORMATION ABSENT	CIRCULAR	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A
<50	DARK BROWN	PRESENT	ABSENT	ABSENT	PROMINENT	ABSENT	CIRCULAR	<50	DARK BROWN	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
>50	DARK BROWN	PRESENT	ABSENT	ABSENT	PROMINENT	ABSENT	ABSENT	>50	DARK BROWN	PRESENT	ABSENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	P	A		P	P	P	P	A
>50	DARK BROWN	PRESENT	PRESENT	PRESENT	PROMINENT	RHOMBOID FORMATION PRESENT	CIRCULAR	>50	DARK BROWN	PRESENT	PRESENT	PRESENT		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	P	A
<50	DARK BROWN	PRESENT	ABSENT	ABSENT	PROMINENT	ABSENT	CIRCULAR	<50	DARK BROWN	PRESENT	PRESENT	ABSENT		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	P	A		P	A	P	P	A

RAMIFIED CAPILLARIES	ECTASIA	NFC RT	4TH RT	DROP OUTS	TORTUROUS CAPILLARIES	CROSS LINKED CAPILLARIES	GIANT CAPILLARIES	HAEMORRHAGE	RAMIFIED CAPILLARIES	ECTASIA	NFC 5TH RT	DROP OUTS	TORTUROUS CAPILLARIES	CROSS CAPILLARIES	LINKED	GIANT CAPILLARIES	HAEMORRHAGE	RAMIFIED CAPILLARIES	ECTASIA	NFC 1ST LT	DROP OUTS	TORTUROUS CAPILLARIES	CROSS LINKED CAPILLARIES	GIANT CAPILLARIES	HAEMORRHAGE	RAMIFIED CAPILLARIES	ECTASIA	NFC 2ND LT	DROP OUTS	TORTUROUS CAPILLARIES	CROSS LINKED CAPILLARIES	GIANT CAPILLARIES	HAEMORRHAGE	RAMIFIED CAPILLARIES	ECTASIA	NFC 3RD LT	DROP OUTS	TORTUROUS CAPILLARIES	CROSS LINKED CAPILLARIES	GIANT CAPILLARIES	HAEMORRHAGE		
A	A			P	P	A	A	A	A	A		P	A	A	A	A	A	P	A		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV		P	A	A	A	A
A	A			P	A	P	A	A	A	A		P	P	P	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
P	A			P	P	P	A	A	A	A		P	P	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV	A	P	A	A	P	A	A	A	A		P	A	A	A	A	A	
A	A			P	P	P	A	A	A	A		P	A	A	A	A	A	A	A		P	A	A	A	A	A	A		P	A	A	A	A	A	A	A		P	P	A	A	A	
P	A			P	P	P	A	A	P	A		P	P	P	A	A	A	P	A		P	A	A	A	A	A	A		P	A	A	A	A	A	A	A		P	A	A	A	A	
A	A			P	P	P	A	A	A	A		P	P	P	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV		A	P	A	A	A	
A	A			P	P	P	A	A	A	A		P	P	A	A	A	A	P	A		P	P	A	P	A	A		P	P	P	A	P	A	A		P	P	A	A	A			
A	A			P	A	P	A	A	A	A		P	A	P	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A		
A	A			P	A	A	A	A	A	A		P	A	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A		
A	A			P	A	A	A	A	A	A		P	A	P	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A		
A	A			P	A	A	A	A	A	A		P	P	P	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	A	A	A	A	A	A		P	P	A	A	A		
A	A			P	P	P	A	A	P	A		P	P	P	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	P	A	A		P	P	A	A	A		
NV	NV			NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV		
A	A			P	P	P	A	A	P	A		P	P	P	A	A	P	P	A		NV	NV	NV	NV	NV	NV	NV		P	P	A	P	A	A		P	P	A	P	A			
A	A			P	P	P	A	A	A	A		P	P	P	A	A	A	P	A		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	P	A		P	P	P	A	A			
A	A			P	P	P	A	A	A	A		P	A	P	A	A	A	P	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A		
A	A			P	P	P	A	A	A	A		P	P	P	A	A	A	P	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A		
A	A			P	P	P	A	A	A	A		P	A	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	A	A	A	A	A		P	A	A	A	A			
A	A			P	A	A	A	A	A	A		P	A	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A		
NV	NV			P	A	A	A	A	A	A		P	P	P	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV		

	A		P	P	A	A	A	A	A		P	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	P	P	P	A	A	A		P	P	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	
A	A		P	P	P	A	A	P	A		P	A	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A		P	P	P	A	A
A	A		P	A	A	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A		P	A	P	A	A
A	A		P	P	P	A	A	A	A		P	A	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A
A	A		P	P	A	A	A	A	A		P	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A		P	A	A	A	A
A	A		P	P	A	A	A	A	A		P	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A		P	A	A	A	A
A	A		P	A	A	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
A	A		P	A	A	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A		P	A	P	A	A
A	A		P	A	A	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A
A	A		P	P	P	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A		P	P	P	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
A	A		A	P	A	A	A	A	A		P	P	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A		P	A	P	A	A
A	A		P	A	A	A	A	A	A		P	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A
A	A		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
A	P		P	P	P	A	A	P	A		P	P	P	A	A	P	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A
A	A		P	P	A	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
A	A		P	P	P	A	A	P	A		P	P	A	A	A	P	A		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	P	A		P	P	A	P	A
A	A		P	A	P	A	A	P	A		P	A	P	A	A	P	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A
A	A		P	P	P	A	A	P	A		P	P	A	P	A	P	A		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	P	A		P	P	P	P	A
A	A		P	P	A	A	A	A	A		P	A	A	A	A	P	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
P	A		P	P	P	A	A	A	A		P	P	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		A	P	A	A	A	A	A		P	A	A	A	A
A	A		P	P	P	A	A	A	A		P	A	A	A	A	A	A		P	A	A	A	A	A	A		P	A	A	A	A	A	A		P	P	A	A	A
P	A		P	P	P	A	A	P	A		P	P	P	A	A	P	A		P	A	A	A	A	A	A		P	A	A	A	A	A	A		P	A	A	A	A
A	A		P	P	P	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		A	P	A	A	A

A	A		P		P	A	A	A			P	P	A	A	A	P	A			P	P	A	A	A		P	P	A	A	A								
A	A		P		P	P	A	A	P	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A	P	P	A	A	A
NV	NV		NV		NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	
A	A		P		P	P	A	A	P	A		P	P	P	A	P	P	A		NV	NV	NV	NV	NV	NV		P	P	A	P	A	P	A	P	A	A		
A	A		P		P	P	A	A	A	A		P	P	P	A	A	P	A		NV	NV	NV	NV	NV	NV		P	P	P	A	A	P	A	P	P	P	A	A
A	A		P		P	P	A	A	A	A		P	A	P	A	A	P	A		NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	P	P	P	A	A
A	A		P		P	A	A	A	P	A		P	P	P	A	A	P	A		NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	P	P	P	A	A
A	A		P		A	A	A	A	A		P	A	P	A	A	A	A		NV	NV	NV	NV	NV	NV		P	A	A	A	A	A	A	P	A	A	A	A	
NV	NV		NV		NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	
P	A		P		P	P	A	A	P	A		P	P	P	A	A	P	A		P	A	A	A	A	A		P	A	A	A	A	A	P	A	A	A	A	
A	A		P		P	P	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	A	P	A	A	A
A	A		P		P	P	A	A	A	A		P	P	A	A	A	P	A		P	P	A	P	A		P	P	P	P	A	P	A	P	P	A	A	A	
A	A		P		A	P	A	A	A	A		P	A	P	A	A	A			NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	P	P	A	A	A
A	A		P		A	A	A	A	A		P	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	P	P	A	A	A	
A	A		P		A	A	A	A	A		P	A	P	A	A	A	A		NV	NV	NV	NV	NV	NV		P	A	A	A	A	A	A	P	A	A	A	A	
A	A		P		A	A	A	A	A		P	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	P	P	A	A	A	
A	A		P		P	P	A	A	P	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	P	P	P	A	A	
NV	NV		NV		NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	
A	A		P		A	A	A	A	A		P	A	A	A	A	A	A			NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	P	P	P	A	A
NV	NV		P		A	A	A	A	A		P	P	P	A	A	A	A			NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	
A	A		P		P	A	A	A	A		P	A	A	A	A	A	A			NV	NV	NV	NV	NV	NV		P	P	P	P	A	A	A	P	P	A	A	
NV	NV		NV		NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	
A	A		P		P	P	A	A	P	A		P	A	P	A	A	A			NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	P	P	P	A	A	
A	A		P		A	A	A	A	A		P	P	P	A	A	A	A			NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	P	A	P	A	A	
A	A		P		P	P	A	A	A	A		P	A	P	A	A	A			NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	P	P	P	A	A
A	A		P		P	A	A	A	A		P	A	A	A	A	A	A			NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	P	A	A	A	A	
A	A		P		A	A	A	A	A		P	A	A	A	A	A	A			NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	P	A	P	A	A
NV	NV		NV		NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV			NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	NV	

A	A		P	A	A	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A		P	A	P	A	A
A	A		P	A	A	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A	A	A		P	A	P	A	A
A	A		P	A	P	A	A	P	A		P	P	P	P	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A
A	A		P	P	P	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A		P	P	P	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
A	A		A	P	A	A	A	A	A		P	P	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A		P	A	P	A	A
A	A		P	A	A	A	A	A	A		P	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A
A	A		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
A	P		P	P	P	A	A	P	A		P	P	P	A	A	P	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A
A	A		P	P	A	A	A	A	A		P	P	P	A	A	A	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV
A	A		P	P	P	A	A	P	A		P	P	A	A	A	P	A		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A	P	A		P	P	A	P	A
A	A		P	A	P	A	A	P	A		P	A	P	A	A	P	A		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV		P	P	P	A	A
A	A		P	P	P	A	A	P	A		P	P	A	P	A	P	A		NV	NV	NV	NV	NV	NV	NV		P	P	P	A		P	P	P	P	A			

RAMIFIED CAPILLARIES	ECTASIA	NFC 4TH LT	DROP OUTS	TORTUROUS CAPILLARIES	CROSS LINKED CAPILLARIES	GIANT CAPILLARIES	HAEMORRHAGE	RAMIFIED CAPILLARIES	ECTASIA	NFC 5TH LT	DROP OUTS	TORTUROUS CAPILLARIES	CROSS LINKED CAPILLARIES	GIANT CAPILLARIES	HAEMORRHAGE	RAMIFIED CAPILLARIES	ECTASIA
P	A		A	A	A	A	A	A	A		P	P	A	A	A	P	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A
A	A		P	P	P	A	A	A	A		P	P	A	A	A	A	A
A	A		P	P	P	A	A	A	A		A	A	A	A	A	A	A
A	A		P	P	A	A	A	A	A		P	P	A	A	A	A	A
A	A		P	P	A	A	A	A	A		A	A	A	A	A	A	A
A	A		P	A	A	A	A	A	A		P	P	A	A	A	A	A
A	A		A	P	A	A	A	A	A		P	P	A	A	A	A	A
A	A		P	A	A	A	A	A	A		P	A	A	A	A	A	A
A	A		P	A	A	A	A	A	A		P	P	P	A	A	A	A
A	A		P	A	A	A	A	A	A		A	A	A	A	A	A	A
A	A		P	P	A	A	A	P	A		P	A	P	P	A	P	A
P	A		P	P	A	A	A	A	A		P	P	A	A	A	P	A

NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
A	A		P	P	P	P	A	P	A		P	P	P	P	A	P	A
P	A		P	P	P	A	A	P	A		P	P	P	P	A	P	A
A	A		P	P	P	A	A	A	A		P	A	P	A	A	P	A
P	A		P	P	P	A	A	P	A		P	P	P	A	A	P	A
A	A		P	P	P	A	A	A	A		P	P	A	A	A	P	A
A	A		P	A	A	A	A	A	A		NV	NV	NV	NV	NV	NV	NV
A	A		P	A	P	A	A	A	A		P	A	P	A	A	A	A
NV	NV		P	A	A	A	A	A	A		P	A	A	A	A	A	A
A	A		P	P	P	P	A	A	A		P	P	A	A	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
A	A		P	P	A	A	A	P	A		P	P	A	A	P	P	A
A	A		P	P	A	A	A	A	A		P	P	P	A	A	A	A
A	A		P	P	A	A	A	A	A		P	P	P	A	A	A	A
A	A		P	P	A	A	A	A	A		P	P	A	A	A	A	A
A	A		P	P	A	A	A	A	A		P	P	A	A	A	A	A
A	A		P	P	A	A	A	A	A		P	P	P	A	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
A	A		P	P	A	A	A	A	A		P	P	P	A	A	A	A
A	A		P	P	A	A	A	A	A		P	P	P	A	A	A	A
A			A	P	A	A	P	A	A		P	P	P	A	A	A	A
A	A		P	A	P	A	A	A	A		P	P	P	A	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
A	A		P	A	P	A	A	A	A		P	A	P	A	A	A	A
A	A		P	A	P	A	A	A	A		P	A	P	A	A	A	A
NV	NV		P	P	P	A	A	A	A		P	P	A	A	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
P	A		P	P	A	P	A	P	A		P	A	P	P	A	P	P
A	A		P	P	P	A	A	A	A		A	P	P	A	A	P	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV

P	A		P	A	P	A	A	P	A		P	P	P	A	A	P	A
A	A		P	A	P	A	A	P	A		P	A	P	P	A	A	A
A	A		P	A	P	A	A	P	A		P	P	A	A	A	P	P
P	A		A	A	A	A	A	A	A		P	P	A	A	A	P	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		P	A	P	A	A	A	A
A	A		P	P	P	A	A	A	A		P	P	A	A	A	A	A
A	A		P	P	P	A	A	A	A		A	A	A	A	A	A	A
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A	A		P	A	A	A	A	A	A		P	P	A	A	A	A	A
P	A		P	P	A	A	A	A	A		P	P	A	A	A	P	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
A	A		P	P	P	P	A	P	A		P	P	P	P	A	P	A
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A	A		P	P	P	A	A	A	A		P	A	P	A	A	P	A
P	A		P	P	P	A	A	P	A		P	P	P	A	A	P	A
A	A		P	A	A	A	A	A	A		P	P	P	A	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
A	A		P	P	A	A	A	A	A		P	P	A	A	A	A	A
A	A		P	P	A	A	A	A	A		A	A	A	A	A	A	A
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A	A		P	P	A	A	A	P	A		P	A	P	P	A	P	A
P	A		P	P	A	A	A	A	A		P	P	A	A	A	P	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
A	A		P	A	P	A	A	A	A		P	A	P	A	A	A	A
NV	NV		P	A	A	A	A	A	A		P	A	A	A	A	A	A

A	A		P	P	P	P	A	A	A		P	P	A	A	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
A	A		P	P	A	A	A	P	A		P	P	A	A	P	P	A
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A	A		P	P	A	A	A	A	A		P	P	P	A	A	A	A
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NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
A	A		P	P	A	A	A	A	A		P	P	P	A	A	A	A
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A	A		P	A	P	A	A	A	A		P	P	P	A	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
A	A		P	A	P	A	A	A	A		P	A	P	A	A	A	A
A	A		P	A	P	A	A	A	A		P	A	P	A	A	A	A
NV	NV		P	P	P	A	A	A	A		P	P	A	A	A	A	A
NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
P	A		P	P	A	P	A	P	A		P	A	P	P	A	P	P
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NV	NV		NV	NV	NV	NV	NV	NV	NV		NV	NV	NV	NV	NV	NV	NV
P	A		P	A	P	A	A	P	A		P	P	P	A	A	P	A
A	A		P	A	P	A	A	P	A		P	A	P	P	A	A	A
A	A		P	A	P	A	A	P	A		P	P	A	A	A	P	P