"ONE YEAR HOSPITAL BASED OBSERVATIONAL STUDY OF TRICHOSCOPY FINDINGS IN ALOPECIA AREATA"

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LIST OF ABBREVIATIONS USED

Sl. No.	Abbreviation	Expansion
1	AA	Alopecia areata
2	AGA	Androgenetic alopecia
3	AT	Alopecia totalis
4	AU	Alopecia universalis
5	DC	Dissecting dellulitis
6	DLE	Discoid lupus erythematosous
7	FFA	Frontal fibrosing alopecia
8	HLA	Human leucocyte antigen
9	PHL	Patterned hair loss
10	SLE	Systemic lupus erythematosis
11	SVH	Short vellus hair
12	TE	Telogen effluvium
13	TTA	Triangular temporal alopecia
14	TTM	Trichotillomania
15	UC	Ulcerative colitis

ABSTRACT

Introduction: Hair loss or alopecia is a disorder that can have serious impact on one's standard of living. Alopecia, depending on the hair follicle damage can be cicatrical (scarring) or non-cicatricial (non-scarring). Alopecia areata is mainly a chronic immunologically mediated inflammatory disease of anagen which can lead to relapsing, non-scarring hair loss. It is characterized by patchy loss of hair of the scalp, sometimes the body but not associated with any inflammation. The diagnosis of AA can sometimes be challenging and it becomes difficult to assess the severity by naked eye.

A dermoscope is a non-invasive, diagnostic tool which is used to examine the minute presenting patterns of skin lesions and also the subsurface skin structures which are invisible to the eye. The term "trichoscopy" was coined for dermoscopy of hair and scalp. In trichoscopy, hair, scalp is visualized at a greater magnification. This also helps in seeing the epidermis of the hair follicle and also the peri-follicular epidermis. Certain measurements like hair shaft thickness can be made using this method.

Trichoscopy can also be used to see certain patterns in alopecia areata. These include the follicular changes, shaft changes and also inter follicular changes. These patterns will help to diagnose and to determine the disease activity and severity of AA.

Objective: One year hospital based observational study of trichoscopy findings in alopecia areata.

Materials and method: This was a one year hospital based observational study consisting of 60 patients with clinically diagnosed as having alopecia areata , irrespective of age or sex.

Patients having alopecia areata with other hair and scalp disorders were excluded. Clinical photographs were taken after informed consent and hair pull test was performed. Trichoscopic examination of the scalp and hair was performed using a videodermatoscope- Dinolite premier am4113zt modeland trichoscopic images were recorded. The various trichoscopic features in aa were noted and the results were tabulated.

Results: alopecia areata was more common in males (65%) with sex ratio of male to female ratio was 1.85:1. The most common age group affected was between 21-30years (40%). Most patients (36.67%) presented with in one month of disease onset. Scalp was the frequently involved site (86.67%) and patchy alopecia was the frequent (83.33%) clinical pattern of presentation. The characteristic follicular features of AA. on trichoscopy noted were black dots, yellow dots and empty hair follicles. Black dots were the commonest finding (63.33%) and had positive correlation with activity of AA. .The characteristic hair patterns noted were broken hair, micro-exclamation mark hair, coudability hair, short vellus hair and less commonly, pigtail hair, upright regrowing hair, tulip hair, monilethrix-like hair and i-hair. Broken hair, micro-exclamation mark hair and coudability hair were commonly seen in active cases with micro-exclamation hair being more specific to active disease.The inter-follicular features noted were honey-coomb pattern, erythema and arborizing blood vessels with erythema being most common finding. The

characteristic nail changes seen were pitting and longitudinal ridges.72% of cases that had clinically inactive disease showed active disease on trichoscopy.

Conclusion: According to our study, trichoscopic features of alopecia areata are characteristic and may prove invaluable in the treatment of the condition. The characteristic follicular features of aa on trichoscopy noted were black dots, yellow dots and empty hair follicles. The characteristic hair patterns noted were broken hair, micro-exclamation mark hair, coudability hair, short vellus hair and less commonly, pigtail hair, upright regrowing hair, i-hair, tulip hair &monilethrix-like hair. Micro-exclamation mark hair, coudability hair, black dots, and broken hair showed positive correlation with disease activity. Of these, micro-exclamation mark hair was the specific marker of active disease and black dots, coudability hair, broken hair and was the sensitive markers of active disease. Many patients who had clinical inactive disease were found to have active disease on trichoscopy. Hence trichoscopy would aid in diagnosing aa in doubtful cases with the help of characteristic findings which may evade the need for biopsy. Trichoscopy acts as a highly accurate and sensitive method for detecting disease activity which would help in early active treatment. It also acts as a tool in assessing the progression of the disease and response to treatment.

Keywords: *Dermoscopy, Trichoscopy, Alopecia areata*

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INTRODUCTION

Hair loss or alopecia is a disorder that can have serious impact on one's standard of living. Alopecia, depending on the hair follicle damage can be cicatrical (scarring) or non-cicatricial (non-scarring). [1]

Alopecia areata is a chronic immunologically mediated inflammatory disease of anagen which can lead to relapsing, non-scarring hair loss. It is characterized by patchy loss of hair of the scalp, sometimes the body, but not associated with any inflammation.[36][50]

The commonest presentation is patchy areas of alopecia. In certain conditions, hair loss will be seen diffusely,sometimes involving the eyelashes, eyebrows (alopecia universalis [AU]). [57]

The diagnosis of AA can sometimes be challenging and it becomes difficult to assess the severity by naked eye. [50]

A dermoscope is a non-invasive, diagnostic tool which is used to examine the minute presenting patterns of skin lesions and also the subsurface skin structures which are invisible to the naked eye. The other terminologies are epiluminescence microscope, skin surface microscope, episcope. [58]

Trichoscopy was termed by Rudnicka, Olszewska in the year 2006. It is the assessment of hair, scalp with the help of a dermoscope. [1]In trichoscopy, hair & scalp is visualized at a greater magnification. This also helps in seeing the epidermis of the hair follicle and also the peri-follicular epidermis. Certain measurements like hair shaft thickness can be made using this method. [2]

Presently, 10-70 fold magnifications are common in the clinical practice. The normal magnifications range from 20-70folds, while the handheld dermoscope magnification is usually 10-fold. [2]

Trichoscopy can also be used to see certain patterns in alopecia areata. These include the follicular changes, shaft changes and also inter follicular changes. These patterns will help to diagnose and to determine the disease activity & severity of AA. [50]

OBJECTIVE

To study the Dermoscopic (Trichoscopic) findings over the patches of hair loss in cases of alopecia areata.

REVIEW OF LITERATURE

- Dermatoscopy is a recent method in dermatology aiding in diagnosis of many hair and scalp disorders. It helps to visualize deep epidermis and lower structures which cannot be seen through the naked eye. It is also known as dermoscopy.[1]
- Dermoscopy, when used in evaluating hair disorders it is known as 'trichoscopy' [1] and the term trichoscopy was initially used by Rudnicka and Olszewska in 2006. [3]
- Trichoscopy is a non-invasive, economical tool which helps the clinician to rapidly differentiate common hair disorders, which is gaining importance in recent.[4]
- This tool enables dermatologists in quick diagnosis and differentiating tineacapitis from alopecia areata, telogen effluvium from patterned alopecia & differentiating cicatricial from non-scarring alopecia. It is also useful in follow up in these disorders [5].
- Follicular hyperkeratosis and scaling are evaluated by drydermoscopy, where interface media is not used.Pigmentary patterns, vascularchanges and follicular features are evaluated by using interface solution.[7]

Types of dermoscopes

1. **Handheld dermoscopes:** The handheld dermoscopes work in either the contact or noncontact mode. The standard magnification of these handheld dermoscopes is (×10).[8]

2. **Basic digital dermoscopes and photographic equipment:** Digital dermoscopes can be connected to computer (via USB) and kits which connect selected handheld dermoscopes to a regular photo camera or to an iPhone. [8] The usual magnification is (×10 to ×80). They have an advantage of higher magnification and picture capturing options, but lack adequate light source. [8]
3. **Advanced digital dermoscopes: -** Digital dermoscopes (videodermoscopes) take high-magnification, high-quality photographs. They are usually expensive with the prices based on softwares used. This type of digital dermoscope offers multiple magnifications from lower to higher range of (×20 to ×70 or ×100).

Modes of dermatoscopy –

Three modes of dermoscopy are. [9]

1. Non-polarized mode, contact
2. Polarized mode with contact
3. Polarized mode with noncontact.

Polarized light reduces skin surface reflection, and hence helps in visualizing deeper skin structures, while non-polarized light gives information about the superficial skin. [2]

Main applications of trichoscopy[2]

1. Non-cicatricial alopecia: Patterned hair loss (PHL), telogen effluvium, alopecia areata, trichotillomania (TTM), and temporal triangular alopecia (TTA)
2. Inflammatory scalp disorders

3. Cicatricial alopecia: LPP, DLE, FFA, dissecting cellulitis, and pseudopelade of Brocq
4. Congenital hair disorders
5. Selection of accurate biopsy site
6. To monitor response to treatment.

The evaluation of hair and scalp using trichoscopy is done by studying various patterns of the hair follicles, inter-follicular patterns and the hair shaft signs.

Table 1: Patterns of trichoscopy

FOLLICULAR PATTERNS[11,12,13,14]	**HAIR SHAFT CHARACTERISTICS[15,16,17,18]**	**INTERFOLLICULAR PATTERNS[19]**
White dots Yellow dots Black dots	Broken hair, I hair, micro-exclamation mark hair, short vellus hair, pig tail hair, regrowing hairs, Hair tufting, Hair fracture, morse code hair, tulip hair.	Pigment patterns Vascular patterns

Description of various relevant trichoscopic patterns

<u>Follicular patterns</u>

- The term “dots” refers to the small, round hair follicle openings seen on trichoscopy.
- Trichoscopy will help in differentiating normal follicular openings from fibrotic, empty or presence of keratotic follicular plugs or hair residues. [2]

- Black dots (cadaverized hairs) – these are pigmented hair which breaks at the level of scalp.[2]
- Yellow dots represent infundibulum of follicle filled with sebum or keratotic material. They vary in shape, colour & size. [47]
- White dots may either indicate fibrosis or eccrine duct openings. Multiple large, irregularly arranged white dots represent peri-follicular fibrosis. Multiple tiny, regularly arranged pinpoint white dots with occasional pigmentation at the periphery represent eccrine duct openings or empty follicles. They are seen in sun unexposed areas and in dark skin patients.[2]

Table 2 [8]: Follicular features and conditions

Black dots	AA,DC, tineacapitis, TTM, after laser depilation, incidental finding in other diseases
Yellow dots	AA: Marker of disease severity, DLE: Large, dark, yellow to brownish-yellow dots, Androgenic alopecia: "Oily" appearance and predominance in frontal area, DC, TTM: Imposed over dark dystrophic hairs
White dots	LPP, sun- unexposed areas: Pinpoint white dots
Red dots	DLE, vitiligo
Pink-gray / gray dots	FFA (eyebrows)

Hair shaft changes

Micro- Exclamation mark hairs (tapering hairs)[48]:

- Micro-Exclamation mark hairs represent fractured telogen hairs having thicker hyper pigmented distal end and hypo pigmented thin, proximal end. [49]

- Exclamation mark hairs seen through naked eyes are 1to 3 cm in length and indicate active disease. These are seen predominately in progressive acute forms of AA.
- However, these hairs can also be seen in non-progressive and stable disease.
- Although these hairs are considered as a characteristic feature of AA, they can also be seen in other conditions like tinea capitals. trichotillomania, anagen effluvium and chemotherapy-induced alopecia.[48]

Broken hairs:

- They represent hair shafts that get fractured at various levels after emerging from the scalp. [7]
- These are terminal hair fractured irregularly as a result of either weakened hair shaft by inflammatory process or due to abrupt re-emergence of incompletely destroyed hair which were previously representing black dots.
- They are seen mainly in active disease with acute onset and is a common feature in non-scarring alopecia.[7]
- They are also seen in, tinea capitis, traction alopecia, trichotillomania, primary scarring alopecia, AGA and TE. [48]

Coudability sign/hair:

- It represents the kinking of terminal hair near to the scalp surface when the hair is pushed perpendicularly. It is considered as a sign of active disease in AA.[50]
- Initially it was described by shuster in 1984.
- The appearance of the kink gives the hair the shape of a coude catheter (Bailey, Bishop &Morson, 1958).[51]

Short vellus hairs (SVH)[48]:

- Short vellus hairs are less than 10 mm in length and are hypopigmented.
- They can be seen in nearly 10% of normal scalp. They appear as thin, hypopigmented hair over the patch which at times may be difficult to locate through naked eyes.
- SVH occur mainly in remitting or long standing stages.
- Also, conversion of this hair in to terminal hair is said to be prognostically good sign representing regrowth.
- SVH are proposed as a sensitive feature in AA, however, this not specific to the disease.

Upright regrowing hairs:[48]

- These are newly grown hairs that appear straight with distal tapered end. They have to be differentiated from SVH. Apart from alopecia areata, they were also occurring in trichotillomania, acute TE, triangular alopecia and tineacapitis.

Pigtail hairs: [48]

- These are regrowing hair appearing as coiled, short hair with tapering ends. They are sign of regrowth.
- They are mostly described in children but have also been described in trichotillomania, scalp tinea and triangular temporal alopecia.
- They are also observed in cicatricial alopecia over the hair bearing regions.

Tulip hair: [8]

- Tulip hair appears thin at the lower end and tulip like hyper-pimentedbulged distal end.
- These short hairs are seen in patients with trichotillomania and alopecia areata.

Monilethrix like hair (Pohl-Pinkus constrictions):[48][52]

- "Pohl-Pinkus constrictions represent areas of reduced diameter within the hair. These constrictions appear due to abrupt & recurrent suppression of mitotic activity in the hair follicle by either external or internal factors.
- These are described in active diseases of AA.
- They are also observed in scarring alopecia, severe infections, drug induced alopecia after major blood loss, in severe nutrient deficiencies, following a-interferon-2c therapy, and in localized hereditary hypotrichosis.

'i' hair:[53]

- These are small hair having hyperpigmented distal end and a thin hypo-pigmented shaft below the hyperpigmented distal end, appearing as the letter "i."
- They are described in trichotillomania as a good prognostic sign. Recently it is being decribed in AA as a sign of disease remission.

Inter-follicular patterns

Vascular patterns

- **Interfollicular simple red loops :-[11,19]** They are usually visualized in inflammatory conditions, but can appear in normal scalp as well. They are visualized as hairpin like structures, multiple in number and regularly spaced. Their absence signifies epidermal atrophy.

- **Interfollicular twisted loops:-**[11,19] This pattern is characteristic of acanthotic conditions like folliculitis decalvans, psoriasis etc. They are best visualized by tangential placement of the probe to the scalp surface and appear as twisted coils.
- **Arborizing red lines:-**[11,19] They appear as lines beneath the loops in diseased or normal scalp . They are better visualised with higher magnification.

Pigment patterns:[11, 19]

- The normal scalp has a diffuse honeycomb pigment pattern, better appreciable in darker skin people . It appears as irregular lines that represent of pigmented rete ridges and hypochromic holes, representating the of supra-papillary epidermis.

Alopecia areata

- Alopecia areata (AA) is common, chronic, non-cicatricial, immune mediated inflammatory hair loss involving the scalp & body.[20][21].
- This accounts for nearly 25% of alopecia cases and is a common hair disorder seenin the dermatology OPD. [22]
- Cornelius Celsus described this initially and 'Sauvages' coined the word alopecia areata in 1760.[23]

Epidemiology

- Prevalence of AA is around 0.1%. This hair disorder can affect both adults and children and hairs of all colour are affected. [24][25]

- In India, it accounts for about 0.7% of new cases in dermatology OPD and around 2% in UK & USA. [23][25][26]
- Both males & females are equally affected, [20] but some studies reported male preponderance. [23][26][27][28]
- It can affect any age with ages between 30-59 years having the highest prevalence. [22] In about 8.7-20 % cases family members can be affected. [23][29]
- An association of AA with other immune disorders has been found and the association is seen in around 16% of cases of AA[30][31] e.g. autoimmune type of thyroid disorders in 8% to 28%[32], vitiligo in 4% [33], and lupus erythematosus in 0.6% of patients.[34]

Etiology:

- No single cause has been identified in AA. Genetic etiology is described in 4-28% of cases. Initially, viral cause was but later studies declined it.
- Previous studies suggest association to various genes in HLA region (DQB1, DRB1, NOTCH4, and MICA) and genes outside HLA.[36]
- The presence of autoantibodies around hair follicle in AA points out that this disease is autoimmune in nature.
- The blood of AA patients contains increased amount specific IgG auto-antibodies and increased concentration of these antibodies is seen at the border of active lesions of alopecia patches.
- Keratin 16 and trichohyalin is found be the target antigens in AA in many previous studies.[35]

Clinical features :

- AA usually presents with rapid onset of well-defined, single/ multiple patches with smooth surface without atrophy. In active lesions, cadaverized hair, and hair shaft changes such as exclamation hair is seen in few cases. [24][25][38] [37]
- Scalp is the commonly involved site; however any region can be involved based on severity of the disease. When the disease involves near total scalp, it is called as A.totalis and if there is loss of hair from entire body it is called as A.universalis. [36]

Classification of alopecia [36]

1) **Depending on extent -** Patchy alopecia, Alopecia totalis, Alopecia universalis
2) **Based on pattern -** Reticular, Ophiasis, Sisaipho pattern, acute & diffuse total alopecia. Unusual patterns are - Perinevoid alopecia,linear pattern.
    - **Ophiasis pattern** – Here there is alopecia along the lateral and posterior hair margins.
    - **Sisaphio pattern or Ophiasis Inversa** – Hair is present only on temporal and occipital areas. [20][39[40]
    - **Alopecia Areata Incognita** – Diffuse loss of hair on scalp.
    - **"Sudden greying" variant** – pigmented hairs are targeted , therefore resulting in demasking of pre-existing grey hair.[41,42,43]
    - **Reticulate alopecia -** occurs when hair loss is extensive with multiple patches coalescing together.

Depending on disease course and conditions associated, classification given by'Ikeda' is[36]

1) **Atopic type**: This type usually starts at childhood and nearly 30-75% advance to AT.
2) **Autoimmune type**: This type usually occurs in middle-aged people. There is association with few other autoimmune diseases, diabetes with this type and nearly 10-50% show advancement towards AT.
3) **Pre hypertensive type**: This occurs in young people whose parents are hypertensive and 40% of these cases show advancement towards AT.
4) **Common type**: This occurs in the middle-aged population and about 5-15% show advancement towards AT.

Nail changes –

- Nail changes are seen in about 7% to 66%, with an average prevalence of approximately 30%.
- Nail changes are more common in patients with more severe alopecia, such as AU and AT and is seen commonly in children compared to adults .[44]
- AA-associated nail involvement are usually asymptomatic, however, pain and functional problems has been recorded in a few.
- Pitting was most commonly reported nail changes (11.4–0.6%) followed by trachyonychia (8–14%).[44] Other reported changes included onycholysis , ridges, Beau's lines & punctate leukonychia,
- In children, pitting (13.2-18.8%), trachyonychia, and onychomadesis were seen.
- Pitting was noted mainly in the children than in adults. Spotted or mottled

lunulae occurred only in conjunction with pitting in children.

- In AA, nail pits are classically shallow, with a grid-like distribution. Nails may also be dystrophic and cosmetically disfiguring which may impact the quality of their lives .[44]

Associated conditions with AA –

- Atopy is linked with AA in about 10 to 22%. Association with Hashimoto thyroiditis is seen in about 8 to 28% of patients.
- The other associated conditions are vitiligo, psoriasis, diabetes, down's syndrome, addison's disease, SLE, multiple sclerosis, celiac disease and UC.[36].
- Occurrence of type I diabetes was high in the members of the family, but in AA patients, the incidence was less. [36]
- Mood swings and anxiety disturbances are frequently seen AA patients and this may have negative effect on the quality life. Premature cataracts, Punctate opacities of lens,and fundus changes are seen in about 40-50% of AA patients.[36]

Diagnosis of alopecia areata

- **Clinical diagnosis**: Alopecia areata commonly presents with sudden onset of well-demarcated patches of alopecia with smooth surface without atrophy. At times black dots, with "exclamation marks hairs" can be visualized at the margins of the patches aiding in diagnosis. It can also present in other patterns such as ophiasis pattern, diffuse type and alopecia totalis/universalis in which there is loss of hair from other body parts. [37]

- **Hair-pull test** - In this test nearly 10 - 60 hairs are pulled with the help of thumb, middle & index fingers from the base, applying gentle traction. If >10% hairs are easily pulled out, the test is said to be positive and this implies active shedding of hair. If this test is positive at the advancing border of AA patches, the disease is said to be active.[61]
- **Trichogram/pluck test:** In this method, the hair is pulled out from the roots. The root is then examined with a microscope. This helps to observe the hair cycle phase and which helps in diagnosing various hair disorders. [61] [62]
- **Trichoscopy:-** On trichoscopy patches of alopecia show characteristic features such as black dots, yellow dots, coudability hair, "micro-exclamation mark" & broken hairs. Empty follicles, white dots, vellus hair, pigtail hair, upright regrowing hairare less common finding.[37] Some of these featues have shown to be associated with active cases of AA.
- **Histopathology**: Biopsy may be required in unsure cases. In acute and subacute stages, it characteristically shows peribulbar infiltrate of lymphocytes described as "swarm of bees" appearance, consisting of composed of CD4 & CD8 lymphocytes around anagen hair. Miniaturization of follicles is seen along with shifting from catagen to telogen hair.[37]

MATERIALS AND METHODOLOGY

The details of the study methodology are described below:

- ***Study source****:* The study was conducted in the Department of Dermatology, Venereology and Leprosy, in tertiary care hospital, Belgaum as a part of the MD academic curriculum.
- ***Study duration*** – The study was conducted between 1st January 2018 to 31st December 2018
- ***Ethical clearance:*** Clearance was taken from the Ethical Committee of the institute.
- ***Study design:***Hospital based observational study
- ***Sample size:*** The study was a non-randomized single-arm observational study. Hence, based on previous records of patients having alopecia areata who had attended the outpatient department of Dermatology, Venereology and Leprosy in the previous year, a sample size of 35 was calculated. However, the total number of patients attending the OPD during the study period was 60; hence a sample size of 60 was studied.
- ***Sample selection criteria:*** All patients with clinically diagnosed cases of alopecia areata attending dermatology OPD, were enrolled as per the inclusion & exclusion criteria.
- ***Inclusion criteria:*** All consenting patients, irrespective of age , sex with Alopecia areata attending the department of dermatology, between 1st January to 31st December 2018.

- ***Exclusion criteria:*** Alopecia areata with other coexisting hair and scalp disorders were excluded.
- ***Data Collection*** **–**A detailed history regarding the age, sex, occupation, family history, personal habits, duration of the disease and history of previous treatment was taken. Clinical photographs of the lesions were taken. Dermatological and systemic examination was carried out. Diagnosis of alopecia areata was made on clinically and by performing hair-pull test. Alopecia areata was classified as patchy AA, ophiasis AA, alopecia universalis and alopecia totalis based on the distribution of alopecia. Dermoscopic/trichoscopic examination of the scalp and hair was performed using a video-dermatoscope (Dinolite premier AM4113ZT model) providing 50X and 200X magnification. Areas of bald patches wereexamined in both center and periphery of the patch and its images were recorded. The findings were noted in proforma after taking consent.
- ***Statistical Method for Data Analysis:*** Correlation method and Chi-square test was used wherever applicable.

RESULTS AND OBSEVATIONS

A total of 60 patients of alopecia areata were enrolled in a period of one year from 1st January to 31st December 2018.

1. Sex distribution:

Of 60 cases included in the study, 39 (65%) were male and 21 (35%) were female, indicating a male predominance.

Table 3- Gender distribution

GENDER	NO OF PATIENTS	% OF PATIENTS
MALE	39	65.00
FEMALE	21	35.00

2. Age distribution:

Most patients belonged to the group of 21-30 years which constituted 24 cases (40%). Cases less than 10 years were 5 (8.33%), 11-20 years were 17 years (28.33%), more than 31 years were 14 (23.33%).The average age of all the patients enrolled in the study was 25.12 years.

Table 4: Age distribution

AGE GROUP	NO OF PATIENTS	% OF PATIENTS
<=10YEARS	5	8.33
11-20YEARS	17	28.33
21-30YEARS	24	40.00
>=31YEARS	14	23.33

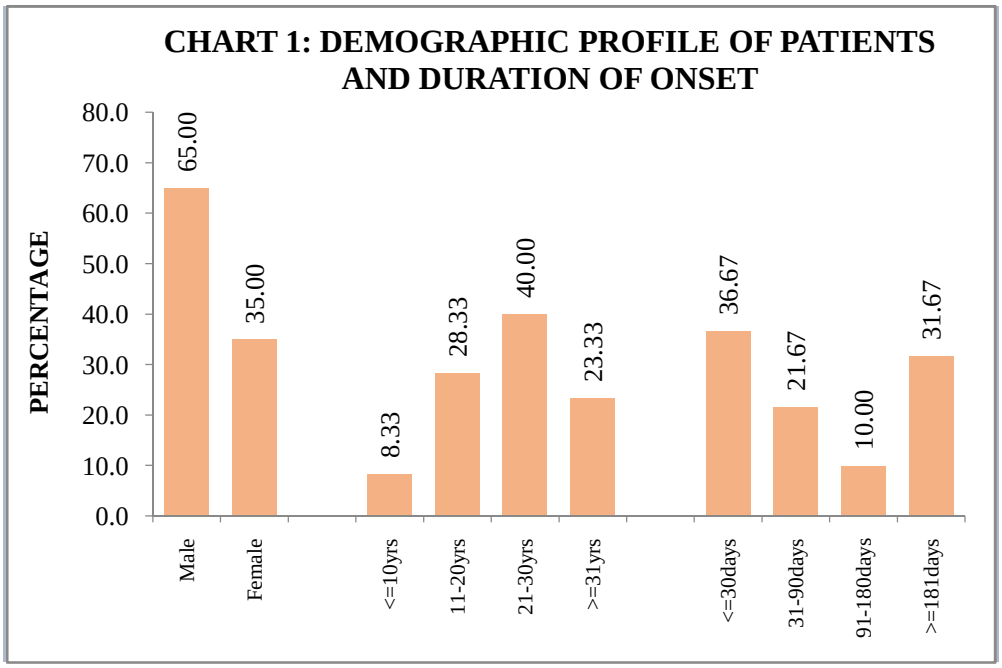
3. Duration of onset

The duration of onset in the cases studied ranged from three days to 10 years. Mean duration of disease onset was 471.92 days.

Most patients in the study i.e. 22 (36.67%) had disease onset less than 30days, followed by 19 patients (31.67%) who had a duration of onset more than six months.

Table 5: Duration of disease onset

AGE GROUP	NO OF PATIENTS	% PATIENTS
<=30DAYS	22	36.67
31-90DAYS	13	21.67
91-180DAYS	6	10.00
>=181DAYS	19	31.67

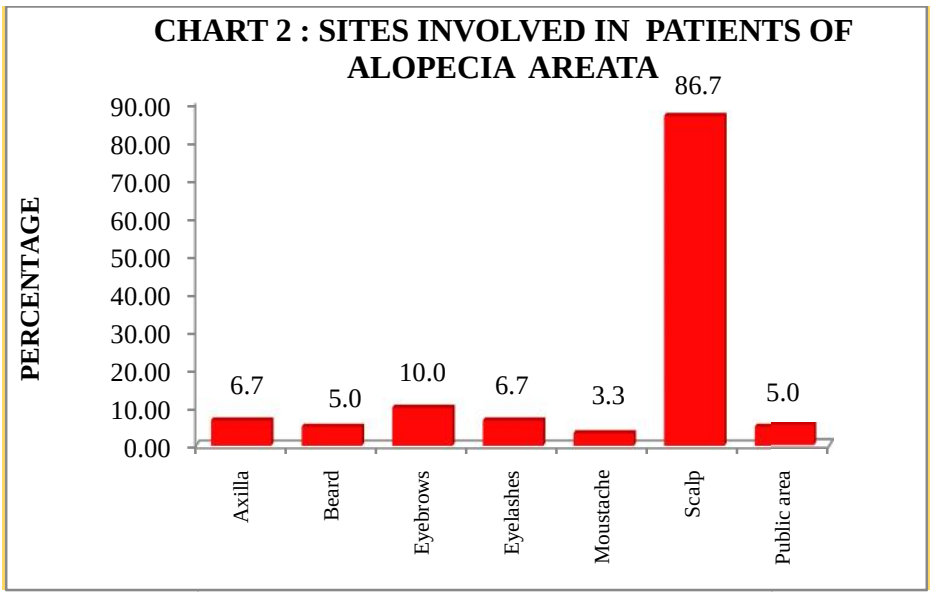


4. Sites involved

The most frequent site involved was scalp among the enrolled patients constituting 52 cases (86.67%) followed by eyebrows constituting 6 cases (10%), axilla and eyelashes constituting 4 cases (6.67%), beard constituting 3 cases (5%) and moustache constituting 2 cases (3.33%).

Table 6: Sites involved

SITES INVOLVED	NO OF PATIENTS	% OF PATIENTS
SCALP	52	86.67
EYEBROWS	6	10.00
AXILLA	4	6.67
EYELASHES	4	6.67
BEARD	3	5.00
PUBLIC AREA	3	5.00
MOUSTACHE	2	3.33



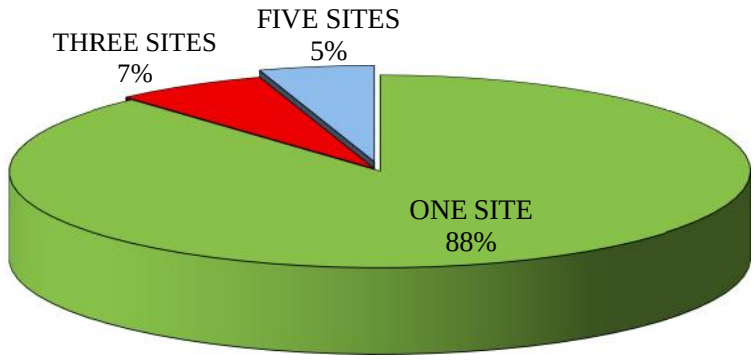
5. Number of sites involved

Patches confined to single site was the commonest presentation accounting to 53 cases (88.33 %) in the study and patients with alopecia involving all the areas i.e. alopecia universalis constituted 3 cases (5%).

Table 7: Number of sites involved

NUMBER OF SITES	NO OF PATIENTS	% OF PATIENTS
ONE SITE	53	88.33
THREE SITES	4	6.67
FIVE SITES	3	5.00

CHART 3 : DISTRIBUTION OF PATIENTS BASED ON SITES INVOLVED

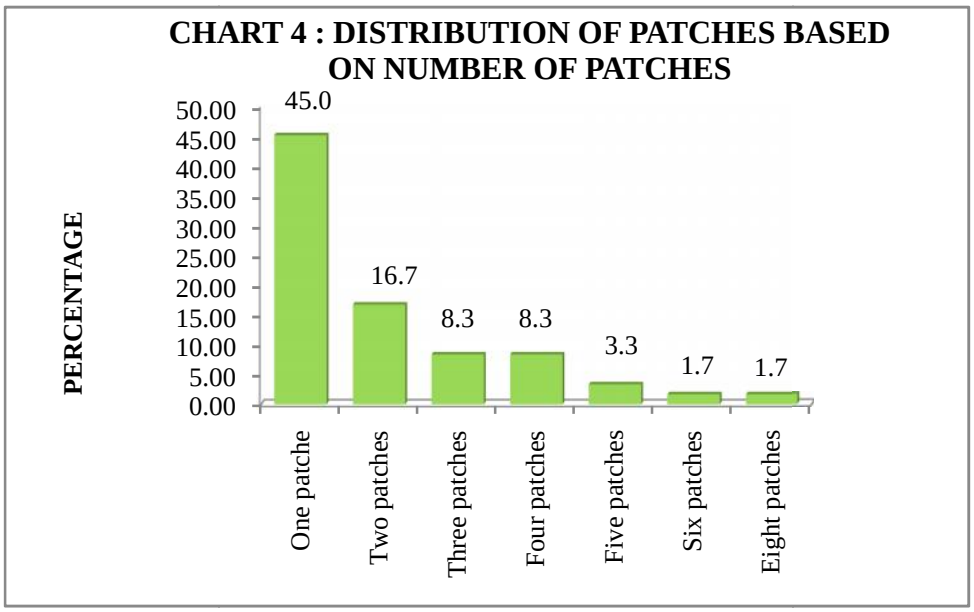


6. Number of patches

The commonest feature at presentation was single patch that constituted 27 cases (45%) followed by those with two patches which constituted 10 cases (16.67%).

Table 8: Number of patches

NUMBER OF PATCHES	NO OF PATIENTS	% OF PATIENTS
ONE PATCH	27	45.00
TWO PATCHES	10	16.67
THREE PATCHES	5	8.33
FOUR PATCHES	5	8.33
FIVE PATCHES	2	3.33
SIX PATCHES	1	1.67
EIGHT PATCHES	1	1.67



7. Treatment history:

Among the enrolled patients, those who had already received treatment in the form of either topical or oral medications at the time of presentation were 33 (55%).

Table 9: Treatment history

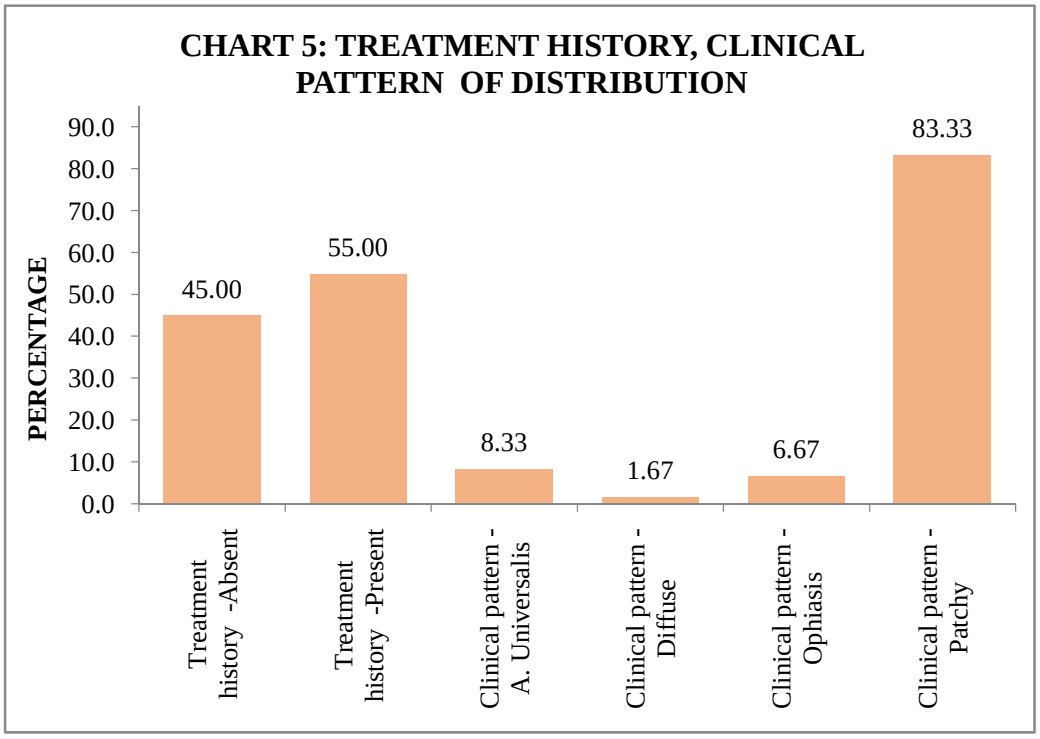
TREATMENT HISTORY	NO OF PATIENTS	% OF PATIENTS
ABSENT	27	45.00
PRESENT	33	55.00

8. Clinical pattern:

Patchy hair loss was the most frequent clinical pattern seen in 50 patients (83.33%), next was alopecia universalis in 5 patients (8.33%), ophiasis pattern in 4 patients (6.67%) and diffuse pattern was observed in 1 patient (1.67%).

Table 10: Clinical pattern of the disease

CLINICAL PATTERN	NO OF PATIENTS	% OF PATIENTS
PATCHY	50	83.33
ALOPECIA UNIVERSALIS	5	8.33
OPHIASIS	4	6.67
DIFFUSE	1	1.67

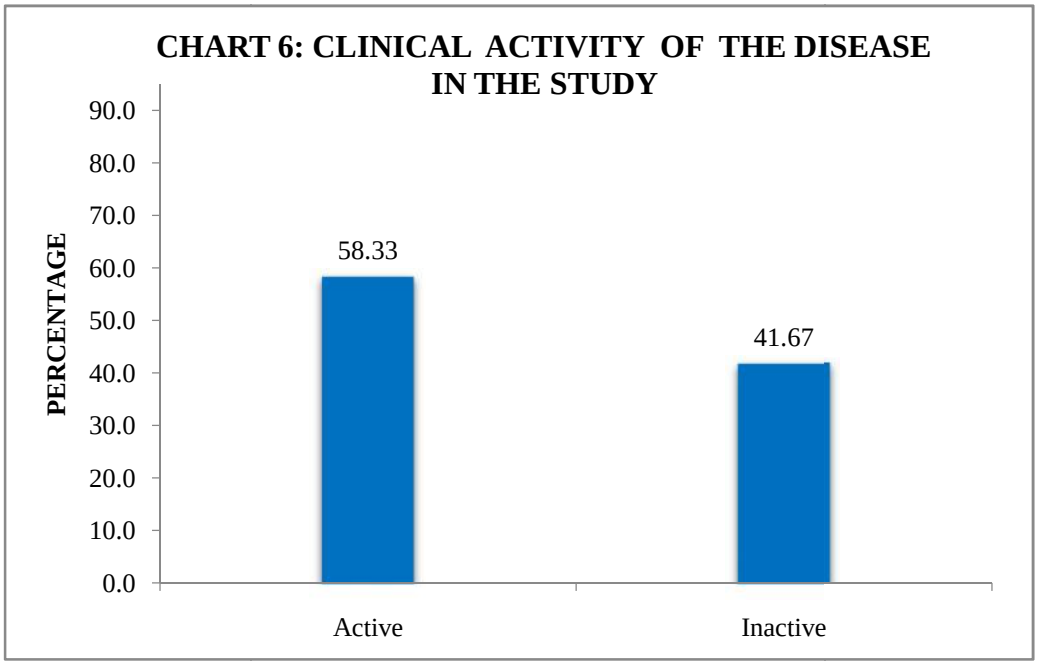


9. Clinical activity:

Clinical activity of the disease was assessed mainly by positive hair pull test, presence of exclamation hair or black dots over the alopecia patches. Among the enrolled patients, 35 (58.33%) patients had clinically active disease and 25 (41.67%) patients showed inactive disease.

Table 11: Clinical activity of the disease

CLINICAL ACTIVITY	NO OF PATIENTS	% OF PATIENTS
ACTIVE	35	58.33
INACTIVE	25	41.67

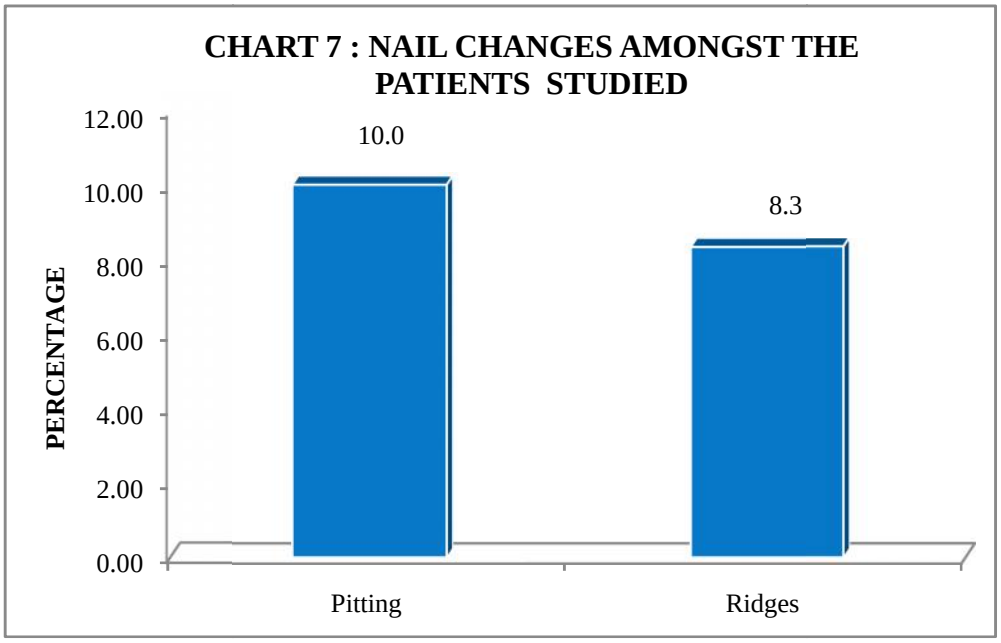


10. Nail changes

The frequent nail changes seen were pitting and longitudinal ridges. Pitting was observed in six cases (10%) patients and ridges were observed in five (8.33%) patients.

Table 12: Nail changes

NAIL CHANGES	PRESENT	% OF PATIENTS
PITTING	6	10.00
RIDGES	5	8.33



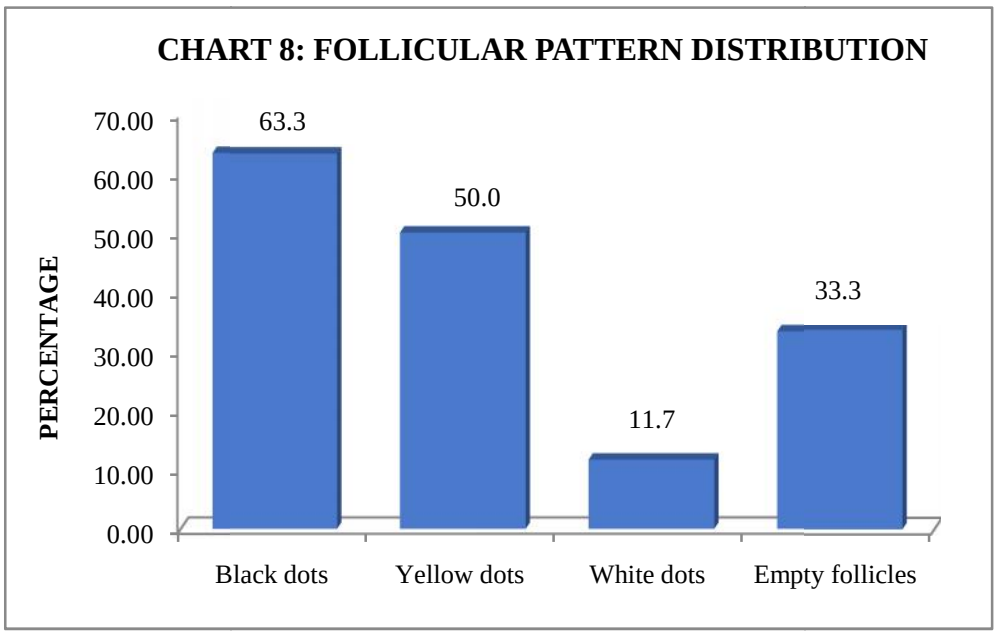
TRICHOSCOPIC FINDINGS:

1. Follicular pattern

Follicular changes were assessed in all the patches of alopecia areata. Black dots were the commonest finding. Black dots was present in 38 (63.33%) patients, yellow dots in 30 (50%) patients while white dots was found in 7 (11.67%) patients.

Table 13: Follicular pattern

FOLLICULAR PATTERN	PRESENT	%	ABSENT	%
BLACK DOTS	38	63.33	22	36.67
YELLOW DOTS	30	50.00	30	50.00
WHITE DOTS	7	11.67	53	88.33
EMPTY FOLLICLES	20	33.33	40	66.67



2. Hair pattern on trichoscopy

Various hair patterns were noted in our patients. Micro-exclamation mark hair was seen in 21 (35%) patients, broken hair in 8 (13.33%) patients, coudability hair in 31 (51.67%) patients, short vellus hair in 27 (45%) patients, upright regrowing hair in 25 (41.67%) patients and pig tail hair in 11 (18.33%) patients.

Less common hair pattern seen were monilethrix-like hair in 1(1.67%) patient, i-hair in 2 (3.33%) patients and tulip hair in 6 (10%) patients. Leucotrichia in alopecia patches was found in 7 (11.67%) patients.

Table 14: Hair pattern

HAIR PATTERN	PRESENT	%	ABSENT	%
MICRO-EXCLAMATION MARK HAIR	21	35	39	65
BROKEN HAIR	8	13.33	52	86.67
COUDABILITY HAIR	31	51.67	29	48.33
SHORT VELLUS HAIR	27	45	33	55
UPRIGHT REGROWING HAIR	25	41.67	35	58.33
PIG TAIL HAIR	11	18.33	49	81.67
MONOLITHEREX HAIR	1	1.67	59	98.33
I-HAIR	2	3.33	58	96.67
TULIP HAIR	6	10	54	90
LEUCOTRICHIA	7	11.67	53	88.33

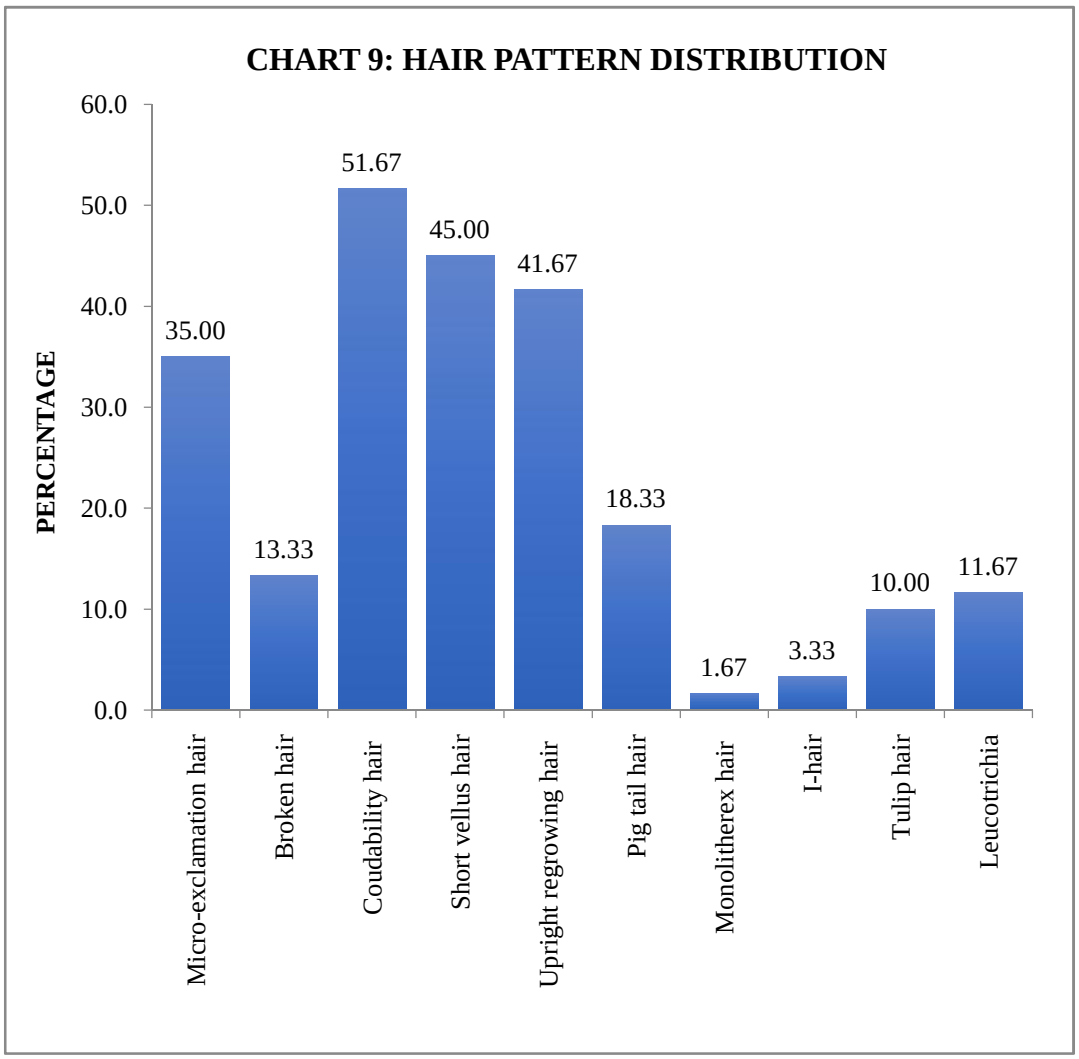


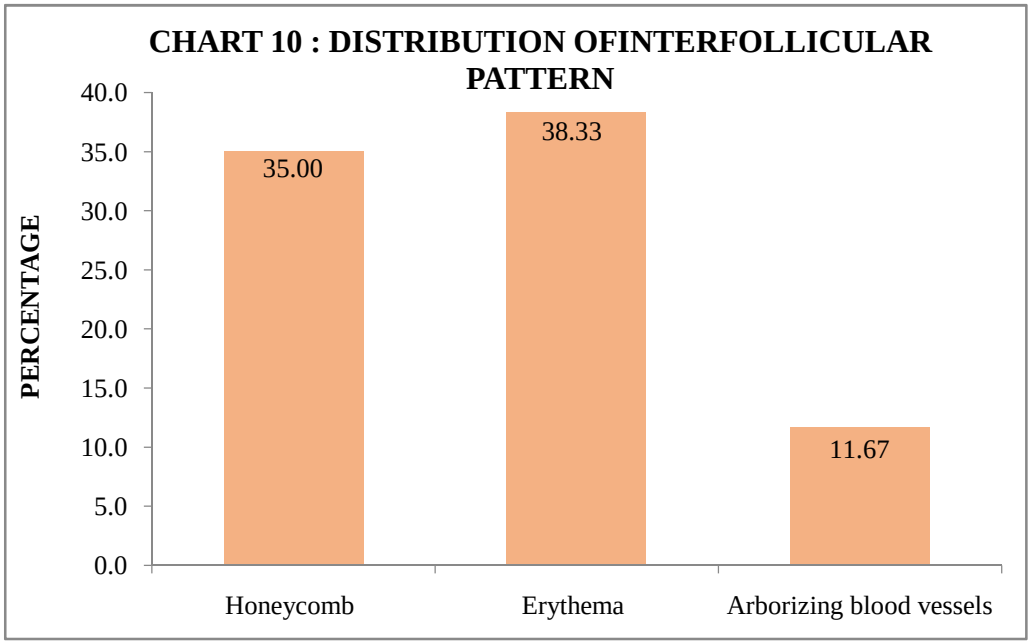
CHART 9: HAIR PATTERN DISTRIBUTION
PERCENTAGE
60.0
50.0
40.0
30.0
20.0
10.0
0.0
35.00
13.33
51.67
45.00
41.67
18.33
1.67
3.33
10.00
11.67
Micro-exclamation hair
Broken hair
Coudability hair
Short vellus hair
Upright regrowing hair
Pig tail hair
Monolitherex hair
I-hair
Tulip hair
Leucotrichia

3. Inter-follicular pattern:

The normal honeycomb pattern of scalp was seen in 21 (35%) patients in the alopecia patches. Erythema was seen in 23 (38.33%) patients and arborizing blood vessels was noted in 7 (11.67%) patients.

Table 15: Inter-follicular pattern

INTERFOLLICULAR PATTERN	PRESENT	%	ABSENT	%
HONEYCOMB	21	35.00	39	65.00
ERYTHEMA	23	38.33	37	61.67
ARBORIZING BLOOD VESSELS	7	11.67	53	88.33



Activity of the disease on trichoscopy:

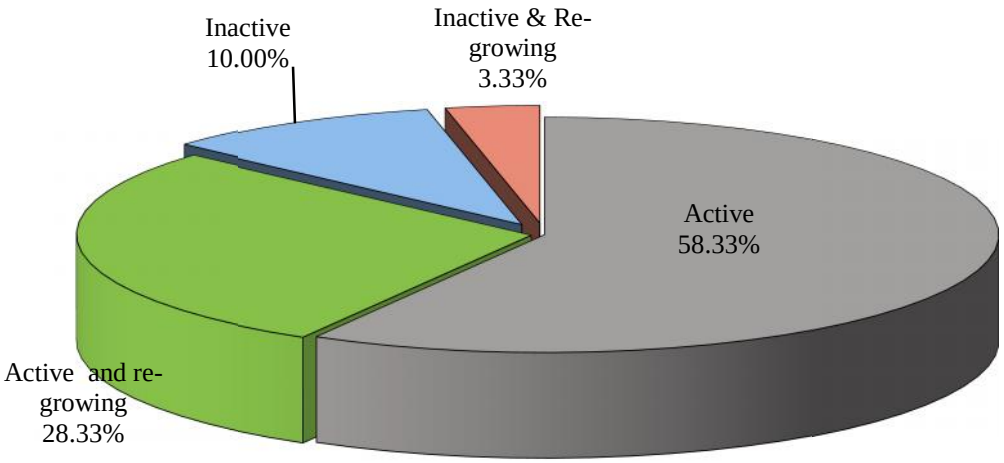
Activity of the disease was assessed mainly by the presence of black dots, micro-exclamation mark and coudability hair on trichoscopy. Absence of any on these above indicated inactive disease and presence of uprightregrowing hair indicated mainly regrowth.

Among the 60 patients, 35 (58.33%) showed active disease while 6 (10%) showed inactive disease. 17 (28.33%) patients showed active disease with regrowth and 2 (3.33%) patients showed only regrowth with no active disease.

Table 16: Activity of the disease on trichoscopy

ACTIVITY TRICHOSCOPICALLY	NO OF PATIENTS	% OF PATIENTS
ACTIVE	35	58.33
ACTIVE AND RE-GROWING	17	28.33
INACTIVE	6	10.00
INACTIVE AND RE-GROWING	2	3.33

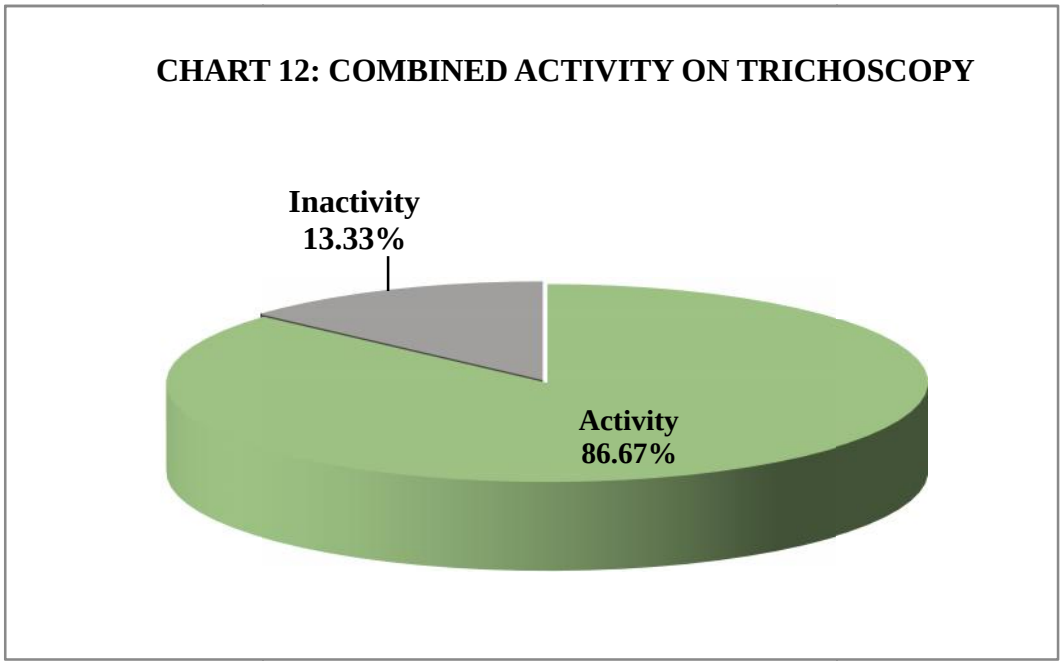
CHART 11:ACTIVITY ON TRICHOSCOPY



Of all enrolled patients, 52 (86.67%) had the active disease on trichoscopy and 8 (13.33%) had inactive disease on trichoscopy.

Table 17: Combined activity on trichoscopy

COMBINED ACTIVITY TRICHOSCOPICALLY	NO OF PATIENTS	% OF PATIENTS
ACTIVE	52	86.67
INACTIVE	8	13.33



Association between disease activity on trichoscopy and follicular patterns on trichoscopy

On trichoscopy, the total number of patients with active disease was 52(86.67%) and with inactive disease were 8 (13.33%).

Black dots were present in 38 (63.33%) patients and all 38 (100%) patients with black dots had active disease which was statistically significant.

Yellow dots were present in 30 (50%) patients. Among these 26 (86.67%) patients with yellow dots had active disease and 4 (13.3%) with yellow dots had inactive disease but showed statistical insignificance.

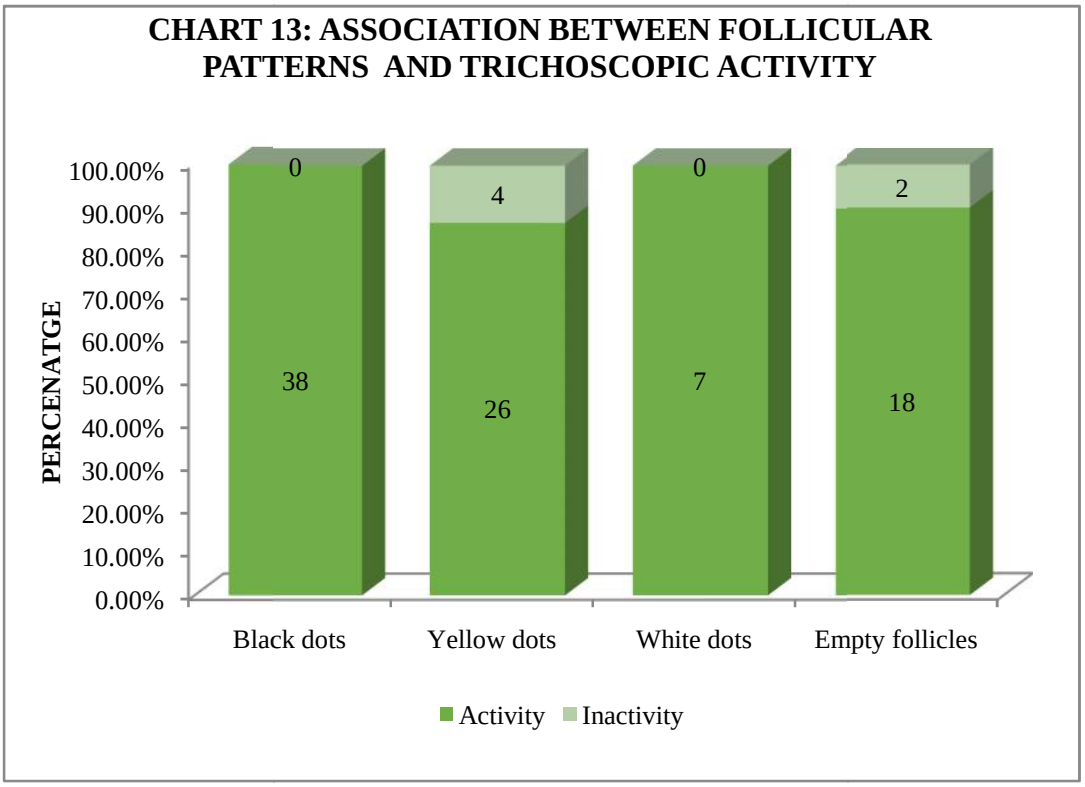
White dots were present in 7 (11.67%) patients and all 7 (100%) patients had active disease but the association was statistically insignificant.

Empty follicles were present intotal 20 (33.33%) patients of which 18 (90%) patients had active disease and 2 (10%) patients had inactive disease.

Table 18: Association between disease activity on trichoscopy and follicular patterns on trichoscopy

FOLLICULAR PATTERN	ACTIVITY	%	INACTIVITY	%	CHI-SQUARE	P-VALUE
BLACK DOTS	38	100.00	0	0.00	12.9520	**0.0001***
YELLOW DOTS	26	86.67	4	13.33	0.0000	1.0000
WHITE DOTS	7	100.00	0	0.00	1.2190	0.2700
EMPTY FOLLICLES	18	90.00	2	10.00	0.2880	0.5910

***P<0.05**



Association between hair patterns with disease activity on trichoscopy

On trichoscopy, the total number of patients with active disease was 52 (86.67%) and those with inactive disease were 8 (13.33%).

1. Micro-Exclamation mark hair was present in 21 (35%) patients and all of these 21 (100) patients had active disease. This association was found to be statistically significant.
2. Broken hairs were present in 8 (13.33%) patients and all 8 (100%) of these had active disease. However the association with the disease activity was statistically insignificant.
3. Coudability hair was present in 31 (51.67%) patients and all 31 (100%) had active disease. And this association was statistically significant.
4. Short vellus hair was present in 27 (45%) patients in the study. Of these 22 (81.48%) had active disease and 5 (18.52%) had inactive disease.
5. Upright regrowing hair was present in 25 (41.67%) patients of which 22 (88%) had active disease and 3 (12%) had inactive disease.
6. Pig tail hair was present in 11(18.33%) patients of which 9 (81.82%) had active disease and 2 (18.18%) had inactive disease.
7. Monolithrix like hair was present in only 1 (1.67%) patient and seen in a case with active disease.
8. ‘i’-hair was present in 2 (3.33%) patients and both these patients had active disease.
9. Tulip hair was present in 6 (10%) patients of which 5 (83.33%) had active disease and 1(16.67%) had inactive disease.
10. Leucotrichia was present in 7 (11.67%) patients in alopecia patches and of these 6 (85.72%) showed active disease and 1 (14.29%) patient showed inactive disease.

TABLE 19: ASSOCIATION BETWEEN HAIR PATTERNS WITH ACTIVITY OF THE DISEASE ON TRICHOSCOPY

HAIR PATTERN	ACTIVITY	%	INACTIVITY	%	CHI-SQUARE	P-VALUE
MICRO-EXCLAMATION HAIR	21	100.00	0	0.00	4.9700	**0.0260***
BROKEN HAIR	8	100.00	0	0.00	1.4200	0.2330
COUDABILITY HAIR	31	100.00	0	0.00	9.8670	**0.0020***
SHORT VELLUS HAIR	22	81.48	5	18.52	1.1420	0.2850
UPRIGHT REGROWING HAIR	22	88.00	3	12.00	0.0660	0.7970
PIG TAIL HAIR	9	81.82	2	18.18	0.2740	0.6010
MONOLITHRIX HAIR	1	100.00	0	0.00	0.1560	0.6920
I-HAIR	2	100.00	0	0.00	0.3180	0.5730
TULIP HAIR	5	83.33	1	16.67	0.0640	0.8000
LEUCOTRICHIA	6	85.71	1	14.29	0.0060	0.9370

***P<0.05 is considered to be statistically significant.**

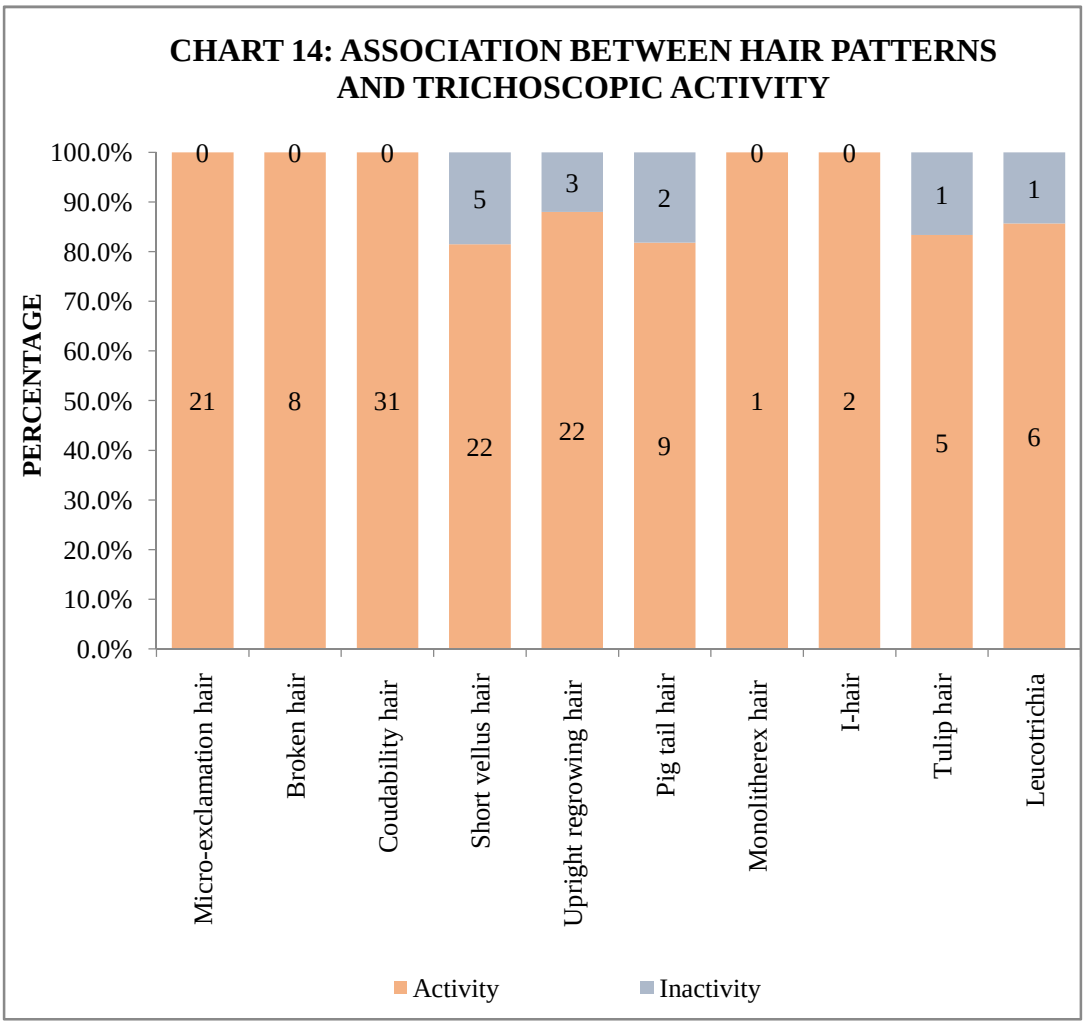


CHART 14: ASSOCIATION BETWEEN HAIR PATTERNS AND TRICHOSCOPIC ACTIVITY
PERCENTAGE
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
0
0
0
5
3
2
0
0
1
1
21
8
31
22
22
9
1
2
5
6
Micro-exclamation hair
Broken hair
Coudability hair
Short vellus hair
Upright regrowing hair
Pig tail hair
Monolitherex hair
I-hair
Tulip hair
Leucotrichia
Activity
Inactivity

Association between interfollicular pattern and disease activity on trichoscopy

Honeycomb pattern was present in 21 (35%) patients of which 20 (95.24%) had active disease.

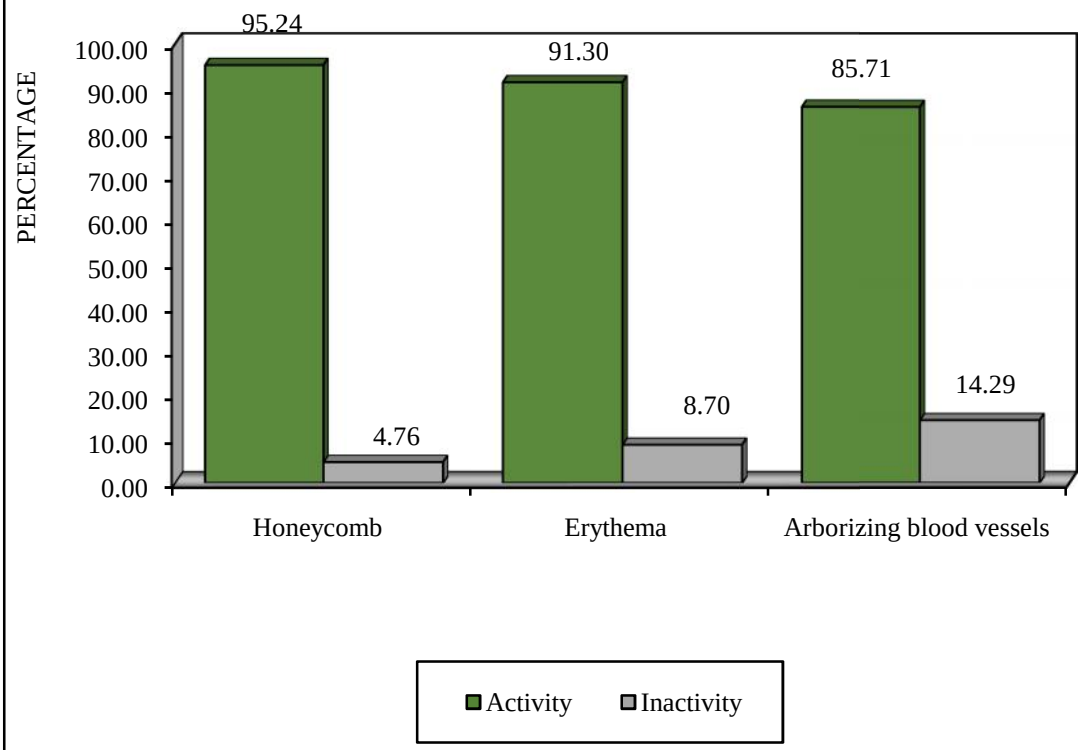
Erythema of the scalp in alopecia were present in 23 (38.33%) patients of which 21 (91.30%) had active disease.

Arborizing blood vessels were present in 7 (11.67%) patients of which 6 (85.71%) had active disease.

Table 20: Association between interfollicular patterns with trichoscopicactivity

INTERFOLLICULAR PATTERN	ACTIVITY	%	INACTIVITY	%	CHI-SQUARE	P-VALUE
HONEYCOMB	20	95.24	1	4.76	2.1530	0.1420
ERYTHEMA	21	91.30	2	8.70	0.6940	0.4050
ARBORIZING BLOOD VESSELS	6	85.71	1	14.29	0.0060	0.9370

CHART 15: ASSOCIATION BETWEEN INTERFOLLICULAR PATTERNS WITH TRICHOSCOPIC ACTIVITY



Association between clinical activity of the disease and follicular pattern on trichoscopy

Among the enrolled 60 patients, clinically, 35 patients (58.33%) had active disease and 25 patients (41.67%) had inactive disease.

Black dots were present in 38 (63.33%) patients of which 25 (65.79%) had active disease and 13 (34.21%) patients had inactive disease.

Yellow dots were present in 30 (50%) patients. Among these 16 (53.33%) had active disease and 14 (46.67%) had inactive disease.

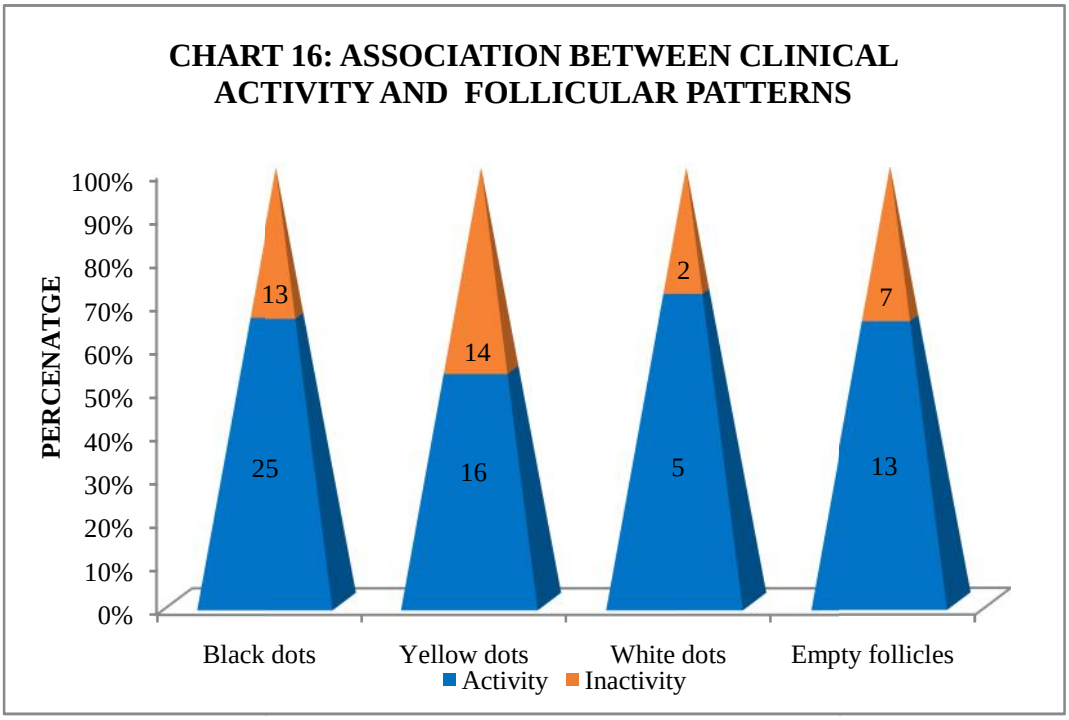
White dots were present in 7 patients of which 5 (71.43%) had active disease and 2 (28.57%) had inactive disease.

Empty follicles were present in 20 (33.33%) patients. Of these 13 (65%) patients had active disease and 7 (35%) had inactive disease.

Table 21: Association between follicular patterns and clinical activity

FOLLICULAR PATTERN	ACTIVITY	%	INACTIVITY	%	CHI-SQUARE	P-VALUE
BLACK DOTS	25	65.79	13	34.21	2.3700	0.1240
YELLOW DOTS	16	53.33	14	46.67	0.6170	0.4320
WHITE DOTS	5	71.43	2	28.57	0.5590	0.4550
EMPTY FOLLICLES	13	65.00	7	35.00	0.5490	0.4590

***p<0.05**



Association between clinical activity of the disease with hair shaft patterns on trichoscopy

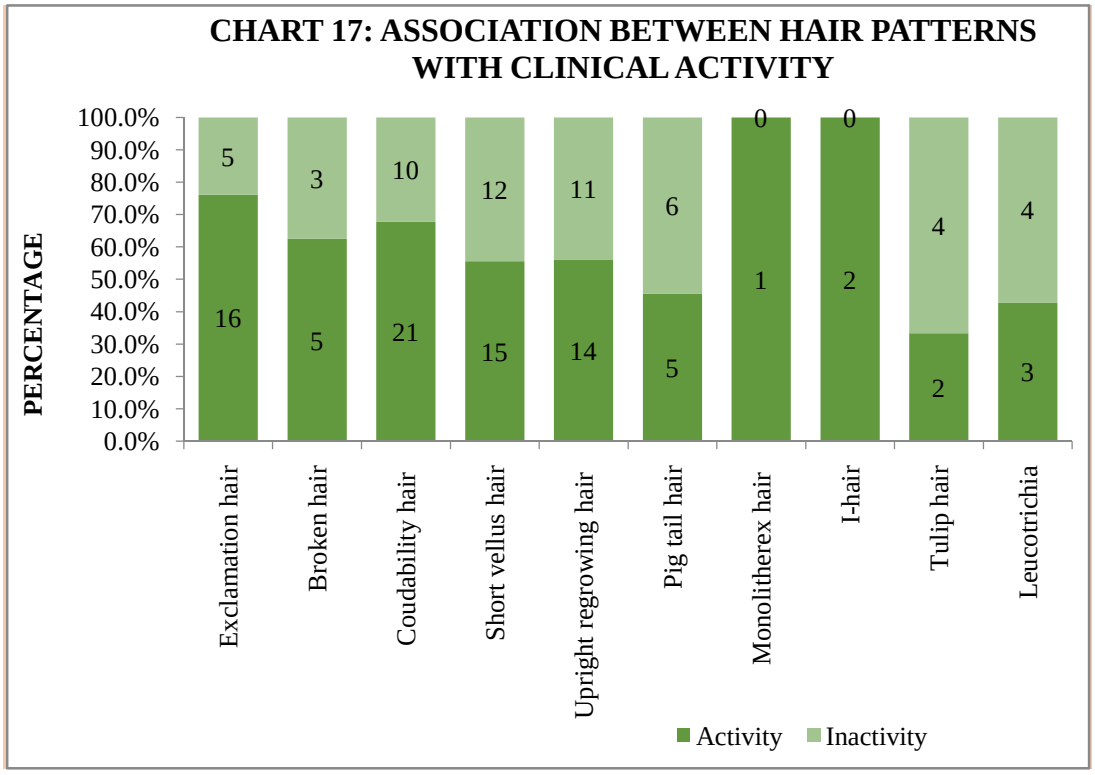
Among the enrolled 60 patients, clinically, 35 (58.33%) had active disease and 25 (41.67%) had inactive disease.

1. Micro-Exclamation hair was present in 21 (35%) patients. Of these 16 (76.19%) had active disease and 5 (23.81%) had inactive disease clinically & was statistically significant.
2. Broken hair was present in 8 (13.33%) patients. Of these, clinically, 5 (62.50%) had active disease and 3 (37.50%) had inactive disease.
3. Coudability hair was present in 31 (51.67%) patients and of these 21 (67.74%) had active disease and 10 (32.26%) patients had inactive disease clinically.
4. Short vellus hair was present in 27 (45%) patients in the study. Of these, clinically, 12 (55.56%) had active disease and 12 (44.44%) had inactive disease.
5. Upright regrowing hair was present in 25 (41.67%) patients of which 14 (56%) had active disease and 11 (44%) had inactive disease clinically.
6. Pig tail hair was present in 11 (18.33%) patients of which 5 (45.45%) had active disease and 6 (54.55%) had inactive disease.
7. Monilethrix- like hair was present in only 1 (1.67%) patient and was present in a clinically active disease case.
8. ‘i’-hair was present in 2 (3.33%) patients and both the patients had active disease.
9. Tulip hair was present in 6 (10%) patients of which 2 (33.33%) had active disease and 4 (66.67%) had inactive disease.
10. Leucotrichia was present in 7 (11.67%) patients in alopecia patches and of these 3 (42.86%) had active disease and 4 (57.14%) patient had inactive disease clinically.

Table 22: Association Between Hair Patterns With Clinical Activity

HAIR PATTERN	ACTIVITY	%	INACTIVITY	%	CHI-SQUARE	P-VALUE
EXCLAMATION HAIR	16	76.19	5	23.81	4.2390	**0.0400***
BROKEN HAIR	5	62.50	3	37.50	0.0660	0.7970
COUDABILITY HAIR	21	67.74	10	32.26	2.3360	0.1260
SHORT VELLUS HAIR	15	55.56	12	44.44	0.1560	0.6930
UPRIGHT REGROWING HAIR	14	56.00	11	44.00	0.0960	0.7570
PIG TAIL HAIR	5	45.45	6	54.55	0.9190	0.3380
MONOLITHEREX HAIR	1	100.00	0	0.00	0.7260	0.3940
I-HAIR	2	100.00	0	0.00	1.4780	0.2240
TULIP HAIR	2	33.33	4	66.67	1.7140	0.1900
LEUCOTRICHIA	3	42.86	4	57.14	0.7810	0.3770

***P<0.05**



Association between interfollicular pattern and disease activity clinically

Honeycomb pattern was sent in 21 (35%) patients of which 14 (66.67%) had active disease clinically.

Erythema of the scalp in alopecia were present in 23 (38.33%) patients of which 17 (73.91%) had active disease.

Arborizing blood vessels were present in 7 (11.67%) patients of which 5 (71.43%) had active disease clinically.

TABLE 23: ASSOCIATION BETWEEN INTERFOLLICULAR PATTERNS WITH CLINICAL ACTIVITY

INTERFOLLICULAR PATTERN	ACTIVITY	%	INACTIVITY	%	CHI-SQUARE	P-VALUE
HONEYCOMB	14	66.67	7	33.33	0.7290	0.3930
ERYTHEMA	17	73.91	6	26.09	3.7250	0.0540
ARBORIZING BLOOD VESSELS	5	71.43	2	28.57	0.5590	0.4550

Association between activity of the disease trichoscopically and clinical activity of the disease

Of 60 patients enrolled, 35 (58.33%)and 52 (86.67%) patients had active disease clinically&on trichoscopy respectively.

Among these, 34(97.14%) patients had active disease both clinically and on trichoscopy.18(72%) patients who showed clinically inactive disease showed active disease on trichoscopy.1 (2.86%) patient who had clinically active disease showed no signs of activity on trichoscopy. 7 (28%) patients showed inactive disease on both clinical and trichoscopic examination. The sensitivity and specificity of the trichoscopy was 97.14% and 28% respectively.

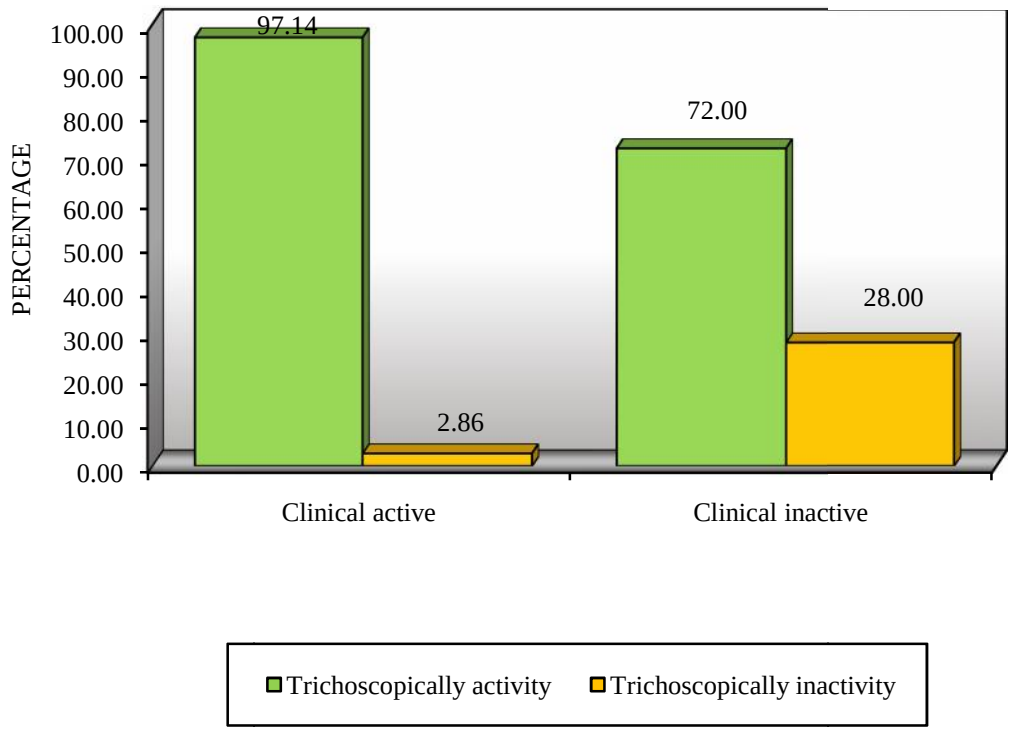
Table 24: Association between activity trichoscopically and clinical activity

CLINICAL ACTIVITY	ACTIVITY TRICHOSCOPICALLY					
	ACTIVITY	%	INACTIVITY	%	TOTAL	%
ACTIVE	34	97.14	1	2.86	35	58.33
INACTIVE	18	72.00	7	28.00	25	41.67
TOTAL	52	86.67	8	13.33	60	100.00

Chi-square with Yates's correction = 5.951 P = 0.0150*

***p<0.05** **Sensitivity – 97.14% Specificity – 28%**

CHART 18: ASSOCIATION BETWEEN TRICHOSCOPIC ACTIVITY AND CLINICAL ACTIVITY



DISCUSSION

Dermoscopy has gained importance in these days with trichoscopy playing a important role in a diagnosing many hair disorders. Trichoscopy is evolving as a needy tool in dermatology opd aiding in quick diagnosis in hair & scalp disorders. In many hair diseases it acts a bridging device between the clinical and histopathology diagnosis.

Clinical diagnosis of alopecia areata (AA) is not difficult at most times, however sometimes it becomes difficult to differentiate it from other conditions such as trichotillomania & t.capitis. In such conditions trichoscopy would help in diagnosis. Also, activity of these cannot be assessed clinically.

Trichoscopy shows characteristic patterns and these features / patterns are used to diagnose and also to assess the activity of the disease. Hence, this study has been undertaken to detect the trichoscopy features in alopecia areata and also to correlate the various findings with activity of the disease.

A total of 60 cases were recruited in our study. Out of the 60 patients of alopecia areata, 39 (65%) were male and 21 (35%) were female patients. The sex distribution in our study showed male predominance (65%) which is consistent with the study done by Ankad B et al (68%), Mane M et al (70%) and Abd-Elaziz Taweel et al (60%).

The age range in years, in our study was between 5-54 years and was comparable with the study by Ankad B et al (3-55 years) and Mane M et al (29 years). The mean age of the patients in our study was 25.2 years which is similar to

studies by Ankad B et al (29 years) and Mane M et al (26.85 years), suggesting that common age affected is middle age.

The mean duration of onset of alopecia in the our study was 15 months which was comparable with study done by Ankad B et al and Mane M et al which were 19 and 10.3 months respectively. But it varies greatly from the values in the study by Abd-Elaziz El-Taweel, et al where the mean duration was 2 months and this variation may be due to reduced sample size.

In our study, scalp was the common site of involvement which corresponded with other studies conducted by Ankad B et al and Mane M et al.

In our study, patchy hair loss was frequent clinical pattern (83.3%) observed and the incidence of this pattern was comparable with studies by Mane M et al (87.7%) and Ankad B et al (96%). Other patterns noted were ophiasis pattern in 6.67%, diffuse pattern in 1.67%, and alopecia universalis in 8.33%.

Trichoscopic features

The trichoscopic features were studied under follicular features, inter-follicular features and hair patterns.

Follicular features:

Our study showed yellow dots in 50% of cases. This was comparable with studies conducted by Ankad B et al (30%), and Abd-Elaziz El-Taweel et al (55%) . But it varied from the values in a study Mane M et al study. These yellow dots are characteristic of alopecia areata however these can be found in other conditions such

as androgenic alopecia, discoid lupus erythematous. They are considered as sensitive marker in alopecia areata.[52]

Black dots represent hairs which break at the level of surface of the scalp. In the present study black dots was seen in 63.33% of patients and is comparable to that of the studies by Abd-Elaziz El-Taweel et al (65%),Mane M et al(44.66%) whereas it varied with the values from the study by Ankad B et al (20%). Also in our study black dots were the most frequent follicular pattern seen.

Empty hair follicles are previously described in AGA. Presence of this feature suggests that hair cycle is at of kenogen stage. Few studies have described this finding in AA .Our study showed incidence 33.33% as compared to study by Nikam V V and Mehta H H et al where the incidence was 16 % incidence. This difference is may be attributed to variation in sample size and dermoscope used.

Hair Patterns:

Broken hair is considered as sign of active disease and commonly seen in severe cases.[55] The incidence of broken hair in AA in different studies had varied results. Our study showed lesser incidence (13.33%) as compared to studies by Ankad B et al (30%), Abd-Elaziz El-Taweel, et al (40.0%) Mane M et al (55.4%).

Micro-Exclamation mark hair (EMH) are seen commonly in active stages of AA, however, these are not a distinct feature in AA as they can be seen other conditions.[50] The incidence of EMH in AA in the our study (35%) is comparable to that found in the studies by Ankad B et al (60%), Abd-Elaziz El-Taweel et al. (50%), but in a study done by Mane M et al, the incidence was comparatively less (12.1%) .

Coudability sign is proposed as marker of disease activity in AA. In the study this feature was seen in 51.67% of patients which was higher when compared with the values of the study by Ankad B et al (10%). This variation may be due to increased number of active cases encountered in our study.

Short vellus hair is sign of regrowth and is an indicator of resolving disease.[55] The incidence of vellus hair in the our study was 45% which is similar to the findings in the studies done by Nikam V V et al and Mehta H H et al which is 34% and studies conducted by Abd-Elaziz El-Taweel, et al where incidence was 40 % . However our study showed greater incidence than the findings in the study by Ankad B et al where the inicidence was 10 %. This variation can be explained by the diversity in types of AA present in both the studies and the time duration of the disease in the patients enrolled in both the studies.

Pig tail hair represent sign of hair regrowth.[50] The incidence of pigtail hair in AA in the present study was 18.33% & is comparable to that found in the study by Abd-Elaziz El-Taweel, et al (15%). However the values differed from the studies done by Ankad B et al (2%) and Nikam V V and Mehta H H et al 0%.

Monilethrix – like hair was seen in 1.67% of patients in this study and this is comparable to the incidence seen in the study by Lidia Rudnicka et al. where incidence was 3%.

The incidence of tulip hair in AA in the present study was 10%. This varied with the incidence in a study by Adriana Rakowska et al which showed the incidence of 2%. This feature has been mentioned in a study by Lidia Rudnicka et al. however, the exact incidence has not been mentioned. This feature is commonly

mentioned in trichotillomania. More studies would be necessary to correlate this feature in alopecia areata.

In this study 'i hair' was noted in 3.33% patients. This feature has been mentioned in a study by Malakar S et al. however the incidence in this study has not been mentioned. Previously, the presence of "i hair" has been mentioned in trichotillomania and t.capitis. This feature in alopecia areata is mentioned in limited studies. Further studies are essential to assess the presence and significance of this sign in AA.

11.67% patients had leucotrichia. The values varied with the values from a study done by Abd-Elaziz El-Taweel, et al, in which the incidence was found to be 45%. Leucotrichia in the alopecia patches has been mentioned in a study by Lidia Rudnicka, et al., however, the incidence has not been mentioned. Previous studies described this hair in patients with remission of disease, however, in our cases, this feature was seen in both active and inactive disease . Further studies would be required to correlate this feature with activity in AA.

The incidence of upright regrowing hair in this study was 41.67% which was constistent with the study by Adriana Rakowska et al. which showed incidence of 44%. This feature represents regrowth of hair in alopecia areata patches.

Inter-follicular pattern:

Honey-comb pattern appears as irregular lines that represent pigmented rete ridges and hypochromic holes, representing the supra-papillary epidermis. This feature was seen in 35% of our patients. In a study by Nikam V V et al. it was noted in 6% of our patients. This variation may be due to difference in the duration of

the disease or presence of long standing extensive AA.

Inter-follicular red loops correspond to capillaries in the upper dermis which was evident in our patients. Arborizing red lines have a larger diameter and they appear as lines beneath the loops in diseased or normal scalp corresponding to papillary plexus and were seen in 11.67% of our patients.

Erythema over the scalp was seen in 38% of patients. These features were mostly observed in patients who had history of usage of any topical medications in the past.

Nail changes

In this study pitting was seen in 10% of cases and was consistent with studies done by Khatiya Chelidze et al, and Tan et al & the incidence was 11.4-0.6%, and 11% respectively. However the incidence varied with study done by Gandhi et al., with incidence of 28%. Also in our study nail changes were seen mainly in active cases, however this was statistically insignificant.

Trichoscopy features and disease activity in alopecia areata:

The clinical activity of the disease was assessed by presence of either of the following: positive hair-pull test, exclamation mark hair or black dots. The trichoscopic activity of the disease was assessed by the presence of either of the following: black dots, microexclamation mark hair. Broken hair or coudability sign.

Among the follicular changes, in patients with clinically active disease black dots and yellow dots were present in 65.79% and 53.33% patients respectively. In trichoscopically active disease, black dots were present in 100% cases and yellow

dots were seen in 86.67% patients. Hence this study shows that both yellow dots and black dots are seen in active disease, however, presence of black dots showed significant statistical correlation with the disease activity. These results were matching with the study done by Inui S et al. [51]

Among the hair shaft changes, in patients with clinically activity disease, micro-exclamation mark hair was present in 76.19 % of patients and was statistically significant. In patients with trichoscopically active disease, all patients were found to have micro-exclamation mark hair. This suggests that micro-exclamation mark hair acts as a specific marker of active disease.

In patients with clinically active disease broken hair and coudability sign was seen 62.5% and 67.74% patientsrespectively. In trichoscopically active cases, broken hair and coudability sign was seen in all cases, however, presence of coudability sign showed statistically significant with the active disease. Hence this study suggests that broken hair and coudability hair correlates positively with disease activity with coudability hair being more specific than broken hair.

Short vellus hair, upright regrowing hair and pigtail hair were present in both active disease and disease remission. In clinically active cases, Short vellus hair, upright regrowing hair and pigtail hair were present in 15%, 56%, 45% respectively and in clinically inactive cases these were found in 44.44%, 44%, and 54.55% respectively. Likewise, in trichoscopically active disease short vellus hair, upright regrowing hair and pigtail hair were present in 81.48%, 88%, 81% respectively and in trichoscopically inactive cases these features were seen in 18%, 12%, 18% respectively. These parameters were seen in both active & inactive stage of the disease in our study. Hence, this study suggests that signs of regrowth can been seen

even in cases of active disease. Also the presence of these features does not always indicate inactive disease. However, no previous studies have mentioned this correlation with the active cases. Hence more studies with larger sample size is required to correlate these parameters separately with respect to activity of the disease in AA.

Tulip hair was seen in 83.33% of trichoscopically active cases, and in 16.67% of trichoscopically inactive cases. Though, this feature is mentioned in few other studies by Rakowska A et al and Rudnicka L et al. the correlation with activity is not mentioned. Hence more studies may be necessary to correlate this finding in AA disease activity.

'i' hair and monolithix-like hair were seen in active disease in our study. However they were statistically insignificant. There are no previous studies showing the correlation of these with disease activity. Hence, more studies are required to correlate these patterns with disease activity.

In our study the clinical activity of the disease was seen in 58.33%, however, the trichoscopic activity of the disease was seen in 86.67%. 72% of patients who had inactive disease clinically showed active disease on trichoscopy. Also the sensitivity of trichoscopy in assessing disease activity was 97.14%. Hence trichoscopy acts as a reliable and more sensitive tool in assessing the disease activity that would aid in early active intervention.

In 2.86% of patients, trichoscopy showed inactive disease though hair pull test was positive. This would indicate that the above trichoscopy indicators alone would not sufficient to assess disease activity on trichoscopy or it can be an observational error since it is seen in very less percent of our cases.

CONCLUSION

The study included 60 patients of alopecia areata cases. The common sex affected was male and common age group affected is 21 – 30 years. Scalp was the frequently involved site with patchy alopecia being the commonest presentation.

The characteristic follicular features of AA noted on trichoscopy were black dots, yellow dots and empty hair follicles. The characteristic hair patterns noted were broken hair, micro-exclamation mark hair, coudability hair, short vellus hair and less commonly, pigtail hair, upright regrowing hair, i-hair, tulip hair & monilethrix-like hair. The inter-follicular features noted were honey-comb pattern, erythema and arborizing blood vessels.

Micro-exclamation mark hair, coudability hair black dots, and broken hair showed positive correlation with disease activity. Of these, microexclamation mark hair was the specific marker of active disease and black dots, coudability hair and broken hair were the sensitive markers of active disease. Also few alopecia areata patches showed features of both active disease and features of regrowth.

Hence trichoscopy would aid in diagnosing AA in doubtful cases with the help of characteristic findings which may evade the need for biopsy. Trichoscopy acts as a highly accurate and sensitive method for detecting disease activity which would help in early active treatment. It also acts as a tool in assessing the progression of the disease and response to treatment.

Perhaps, more studies with larger sample size will help to standardize the trichoscopic findings in alopecia areata.

SUMMARY

This was a hospital based observational study carried out from 1st January 2018 to 31st December 2018. The source of data were patients with clinically diagnosed cases of alopecia areata attending the dermatology opd at KLE'S Dr.Prabhakar Kore hospital, belagavi. All consenting patients having AA were recruited. The exclusion criteria were patients having alopecia areata with other hair and scalp disorders

The objective of the study was to study the dermoscopic (trichoscopic) findings over the patches of hair loss in patients with AA.

The sample size was 60 patients. A detailed history was asked withclinical photographs of the lesions. Systemic & dermatological and examination was carried out. Clinically diagnosed cases of AA were recruited. Dermoscopic / trichoscopic examination of the scalp and hair was performed using a videodermatoscope-dinolite premier AM4113ZT model and trichoscopic images were recorded. The data was noted in a pre-designed profoma after taking informed and written consent.

The results were tabulated. The incidence of each trichoscopic features were presented using percentages. Chi-square test and correlation method was used wherever applicable.

Alopecia areata was more common in males (65%) with sex ratio of male to female ratio was 1.85:1. The most common age group affected was between 21-30 years (40%). Most patients (36.67%) presented within one month of disease onset.

Scalp was the frequently involved site (86.67%) and patchy alopecia was the frequent (83.33%) clinical pattern of presentation.

The characteristic follicular features of AA on trichoscopy noted were black dots, yellow dots and empty hair follicles. Black dots were the commonest finding and had positive correlation with activity of AA.

The characteristic hair patterns noted were broken hair, micro-exclamation mark hair, coudability hair, short vellus hair and less commonly were pigtail hair, upright regrowing hair, tulip hair, monilethrix-like hair and i-hair. Broken hair, micro-exclamation mark hair and coudability hair were commonly seen in active cases with micro-exclamation hair being more specific to active disease.

The inter-follicular features noted were honey-comb pattern, erythema and arborizing blood vessels with erythema being most common finding.

The characteristic nail changes seen were pitting and longitudinal ridges.

72% of cases who had clinically inactive disease showed active disease on trichoscopy and the sensitivity of trichoscopy was 97.14%. Hence trichoscope acts as a more sensitive method of assessing disease activity and also as a tool for assessing the progression of the disease and response to treatment.

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ANNEXURE I

INFORMED CONSENT FORM

I.D.NO. | | | |

Title of the study: One year hospital based observational study of trichoscopy findings in alopecia areata.

The study is conducted by **_____,** Post Graduate (M.D) in Dermatology under the guidance _____ Professor and Head, Department of Dermatology, Venereology and Leprosy, JNMC, Belagavi.

Respected Sir/Madam,

We invite you to participate in our study as you are eligible for the same. During the study you will be asked some questions in detail regarding your present complaints.

Purpose of the study:

Alopecia areata is associated with certain findings in the hair loss area which can be seen using an instrument called dermatoscope. Hence this study intends to observe those changes/findings using the dermatoscope. You are being requested to participate in this study because you have been diagnosed to have alopecia areata.

Procedure:

You will be asked to give a detailed history of your disease, undergo a physical examination and trichoscopic examination.

Risks and Benefits:

The result of you taking part in this research would help health care providers towards a better understanding and diagnosis of this disease, and thus we will be able to provide improved patient care.

Alternatives:

If you decide not to participate in this study, you will still be receiving the usual standard care for your disease.

Privacy and confidentiality:

Your privacy will be respected and all information collected about you during the course of this study will be kept confidential. Your identity will remain undisclosed.

Relations with the Institutional policy:

The J N Medical College will provide within the limitations of the laws of the State of Karnataka facilities and medical attention to patients who suffer injuries as a result of participating in this project.

Financial incentives:

You shall not be receiving any payment or any financial incentives for participating in this study.

Authorization to publish results:

The results of this study may be published for scientific purpose or presented to a scientific group. Your identity, however, will be maintained confidential at all times.

Voluntary participation:

Your participation in this study is voluntary. Your decision whether or not to participate will neither affect the care of your current disease, nor your future relations with the doctor or the hospital. In the event if you suffer any physical injury as the result of your participation in this study, you may contact

In case you need further information regarding your rights as a study participant, you may please contact DR.ROOPA M BELLAD**,** Chairman of the ethical committee, J N Medical College, Belagavi.

STATEMENT OF CONSENT

I.D.NO: | | | |

I Mr/Ms/Mrs ---------- volunteer and consent to participate in this study. I have read the consent document or it has been read to me in my vernacular language. I accept to participate 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:

Signature or left thumb print of participant:

Witness name:

Signature of witness:

Signature of the investigator:

Date:

ANNEXURE-II- ETHICAL CLEARANCE LETTER

K.L.E.UNIVERSITY'S
JAWAHARLAL NEHRU MEDICAL COLLEGE,
NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)
(Accredited 'A' Grade by NAAC)

Website: http://www.jnmc.edu
E-Mail : dome@jnmc.edu

Phone: (+ 91-(0)831 Office : 2471350
Principal: 2471701
Fax No. +91-(0)831 – 2470759

Ref: MDC/DOME/ 26 **Date: 22/11/2017**

To,

REG NO. : BT0117003

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"ONE YEAR HOSPITAL BASED OBSERVATIONAL STUDY OF TRICHOSCOPY FINDINGS IN ALOPECIA AREATA",** is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

(Dr. Arathi Darshan)
Member Secretary
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

(Dr. Roopa M Bellad)
Chairman,
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

ANNEXURE-III

PROFORMA

ONE YEAR HOSPITAL BASED OBSERVATIONAL STUDY OF TRICHOSCOPY FINDINGS IN ALOPECIA AREATA

Case no **OP No-**

Date-

Name-

Age- **DIAGNOSIS:**

Gender-

Occupation-

Address with phone number-

PRESENTINGCOMPLAINTS:

HISTORY OF PRESENT ILLNESS:

1. **Durationof onset** _____
2. **Mode of Onset** ☐ Sudden ☐ Gradual
3. **Site of onset** _____
4. **Progression** ☐ Progressive ☐ Stationary
5. **H/o of itching over the lesion** ☐ Present ☐ Absent

PAST HISTORY:

- **K/c/o DM** ☐ Present ☐ Absent
- **K/c/o HTN** ☐ Present ☐ Absent
- **K/c/o Thyroid diseases** ☐ Present ☐ Absent
- **Any other illness(specify)**_____

FAMILY HISTORY:

1. H/o similar complaints in the family ☐ Present ☐ Absent

CURRENT TREATMENT HISTORY:

1. Topical ☐ Present ☐ Absent

If present,treatment details

2.Systemic ☐ Present ☐ Absent

If present,treatment details-

3. Phototherapy ☐ Present ☐ Absent

If present,treatment details-

PERSONAL HISTORY:

1. Diet: ☐ Vegetarian ☐ Mixed
2. Appetite: ☐ Normal ☐ Decreased
3. Sleep: ☐ Adequate ☐ Disturbed
4. Bowel/Bladder: ☐ Normal ☐ Altered
5. Alcohol: ☐ Present ☐ Absent
6. Smoking: ☐ Present ☐ Absent
7. Tobacco chewing ☐ Present ☐ Absent
8. Stress: ☐ Present ☐ Absent

MUCOCUTANEOUS EXAMINATION:

a) Pattern of hair loss:

Patchy alopecia over:

1. Scalp ☐ Present ☐ Absent
2. Eyebrows ☐ Present ☐ Absent
3. Beard ☐ Present ☐ Absent
4. Moustache ☐ Present ☐ Absent
5. Axilla ☐ Present ☐ Absent
6. Otherarea _____

Ophiasis pattern ☐ Present ☐ Absent

Ophiasis inversus pattern ☐ Present ☐ Absent

Diffuse pattern ☐ Present ☐ Absent

Alopecia totalis ☐ Present ☐ Absent

Alopecia universalis ☐ Present ☐ Absent

Alopecia areata incognita ☐ Present ☐ Absent

Reticular pattern ☐ Present ☐ Absent

other pattern _____

b) Number of lesion :_____

c) Size of lesion: ☐ Small (0.5-1cm) ☐ Large (2-5cm) ☐ Larger (> 10cm)

d) Hair pull test ☐ Present ☐ Absent

e) Coudability sign ☐ Present ☐ Absent

f) Regrowing hair ☐ Present ☐ Absent

g) Vellus hair ☐ Present ☐ Absent

Clinically the features of the disease are suggestive of:

☐ Active ☐ Inactive ☐ Regrowth

e) Nail lesions

1. **Pitting** ☐ Present ☐ Absent
2. **Longitudinal ridging** ☐ Present ☐ Absent
3. **Other changes** ☐ Present ☐ Absent

If present specify _____

TRICHOSCOPY FINDINGS-

a) Follicular Openings

1. **Yellow dots** ☐ Present ☐ Absent
2. **Black dots** ☐ Present ☐ Absent
3. **White dots** ☐ Present ☐ Absent

Others findings _____

b) Hair Shaft Changes

1. **Micro-exclamation hair/tapering hair** ☐ Present ☐ Absent
2. **Broken hair** ☐ Present ☐ Absent
3. **Kinky, zigzag hair** ☐ Present ☐ Absent
4. **Monilethrix-like hairs** ☐ Present ☐ Absent
5. **Vellus hair** ☐ Present ☐ Absent
6. **Regrowing hair** ☐ Present ☐ Absent

Others findings _____

c) InterfollicularAreas

1. ***Vascular pattern***

- **Simple red loops** ☐ Present ☐ Absent
- **Arborizing red lines** ☐ Present ☐ Absent
- **Other pattern** _____

2. ***Pigmentary pattern***

- **Honeycomb pattern** ☐ Present ☐ Absent
- **Other pattern** _____

On dermoscopy the features of the diseases are suggestive of:

☐ Active ☐ Inactive ☐ Regrowth

Signature **Guide's Signature**

ANNEXURE IV – FIGURES

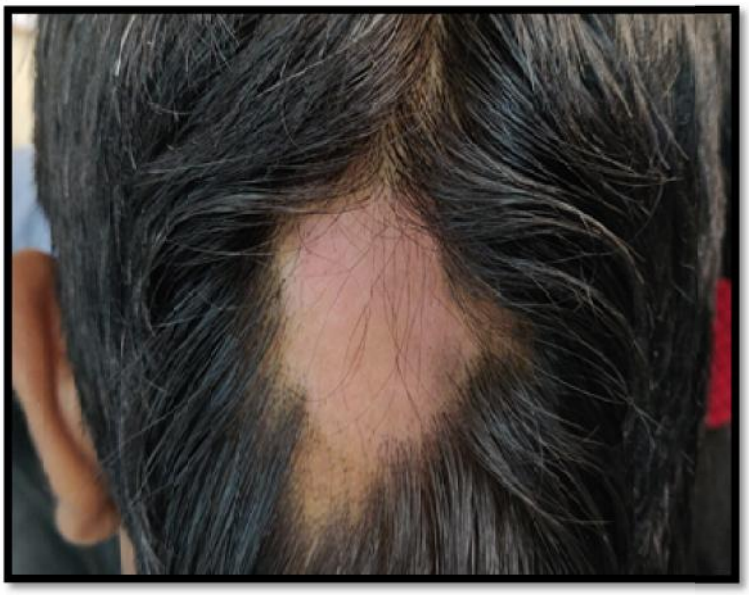


Figure 1: Patchy hair loss

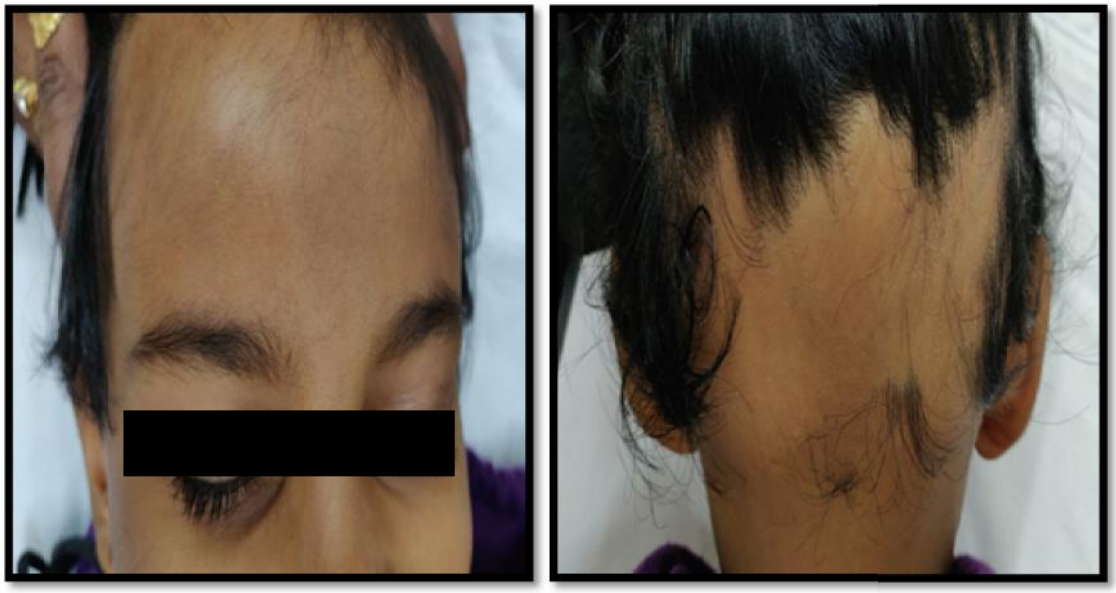


Figure 2 (A and B): Ophiasis pattern

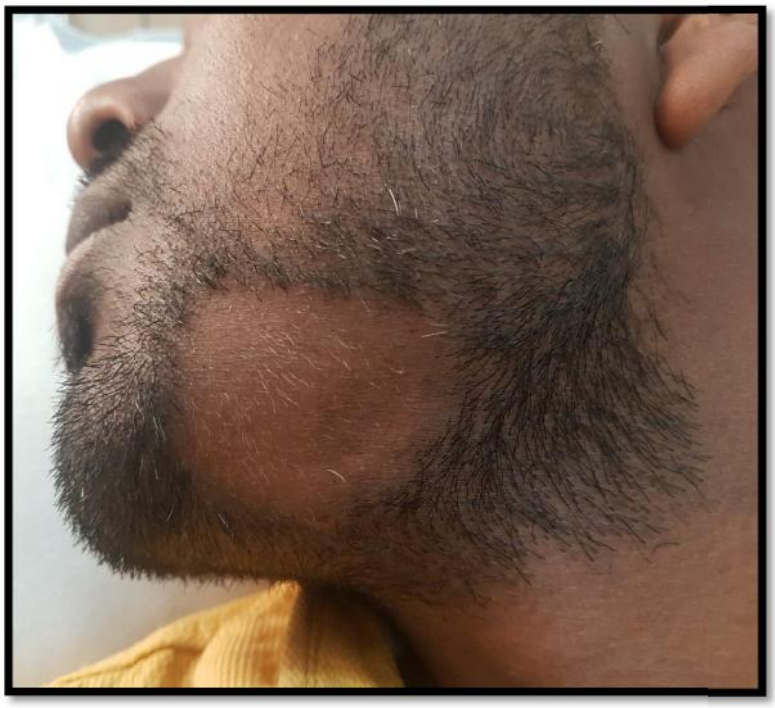


Figure 3: Patchy hair loss over the beard

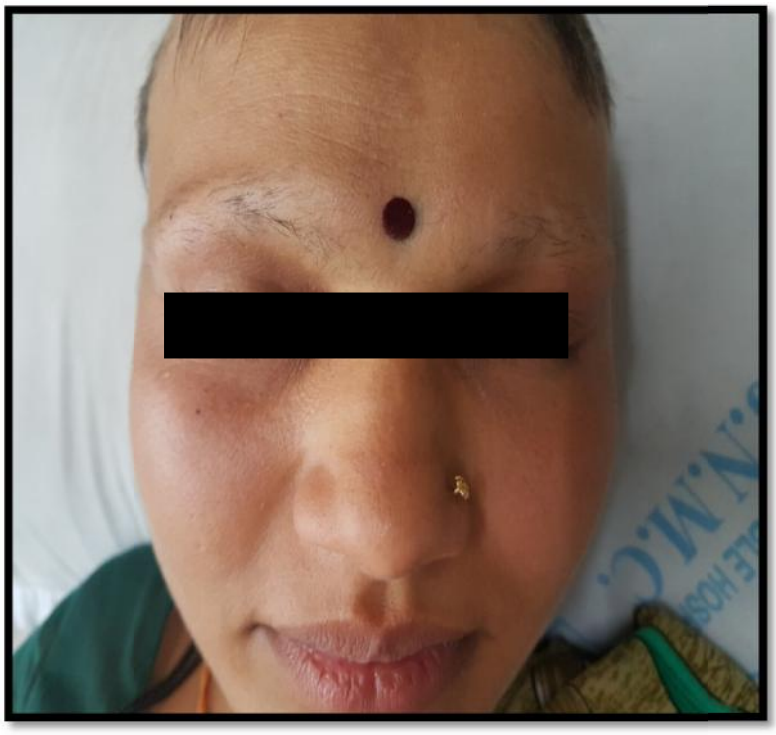


Figure 4: Loss of hair over eyebrows

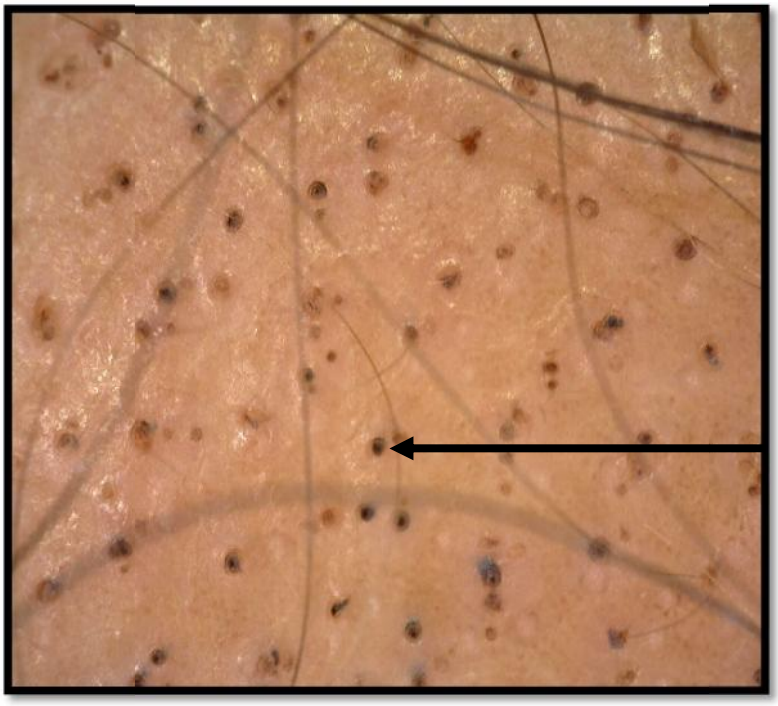


Figure 5: Multiple black dots

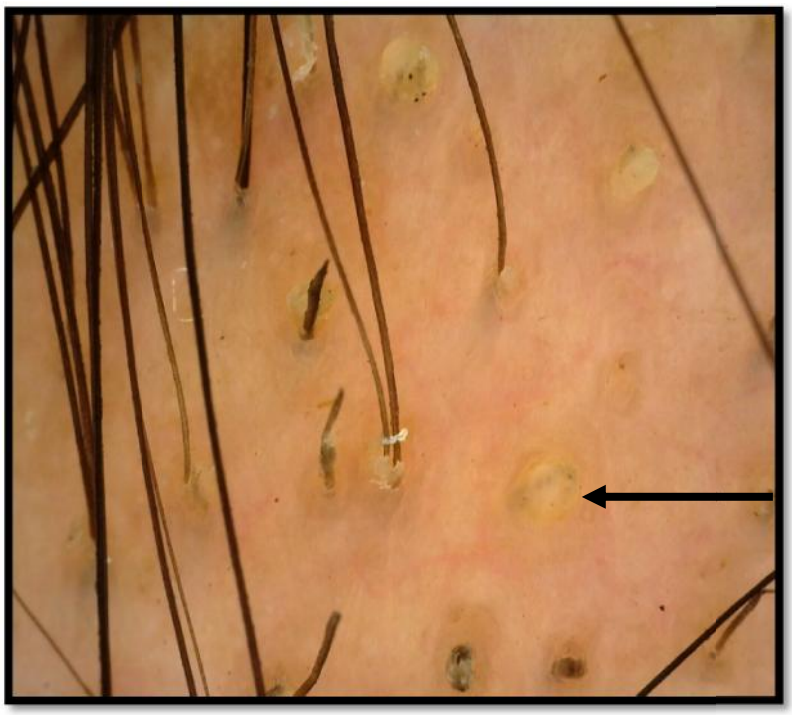


Figure 6: Multiple yellow dots

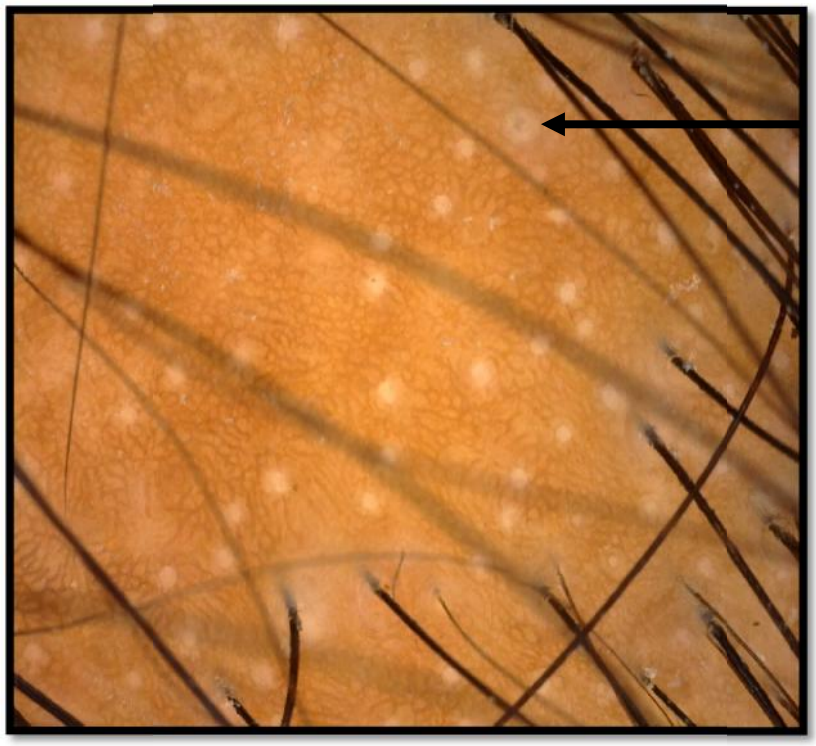


Figure 7: Multiple white dots

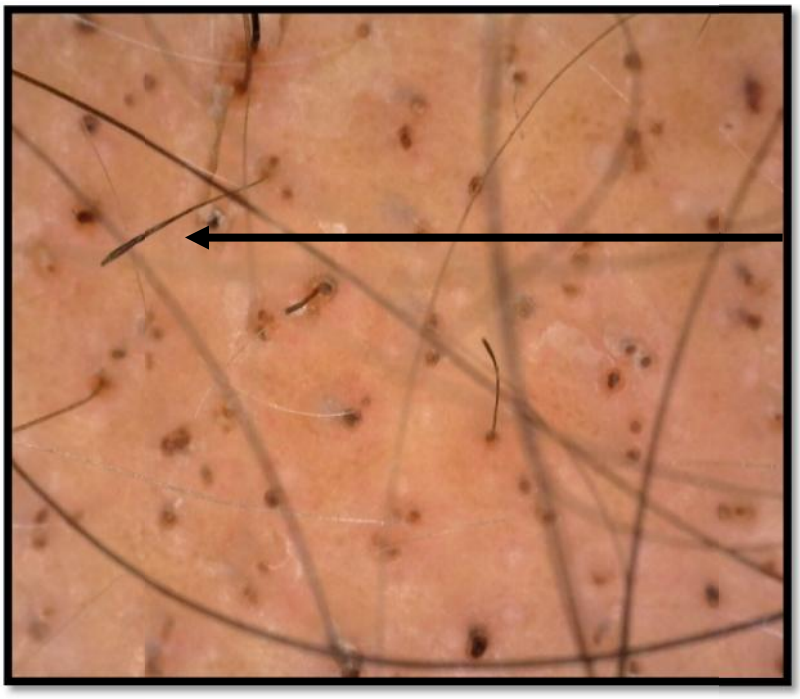


Figure 8: Micro-exclamation hair

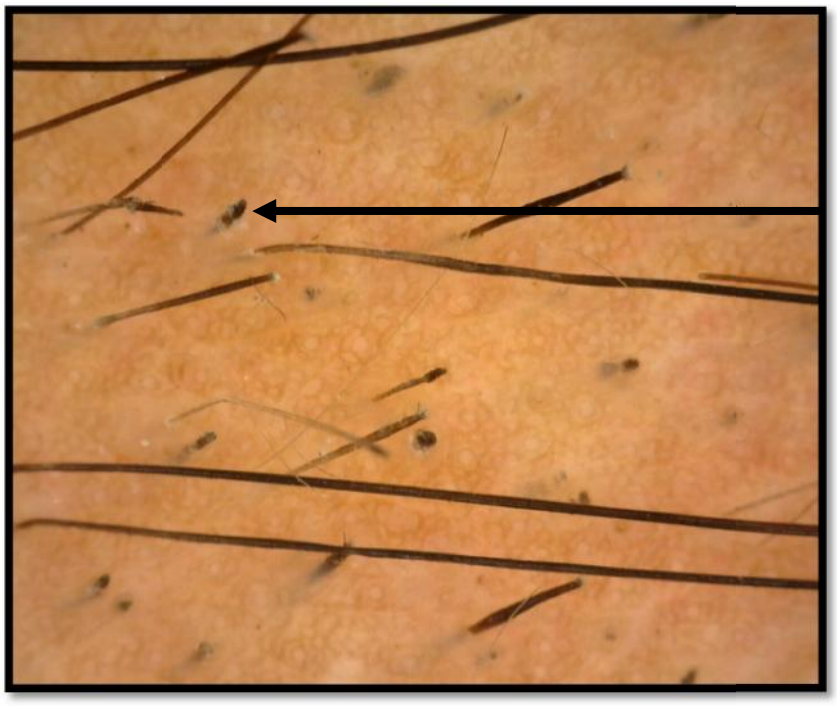


Figure 9: Broken hair

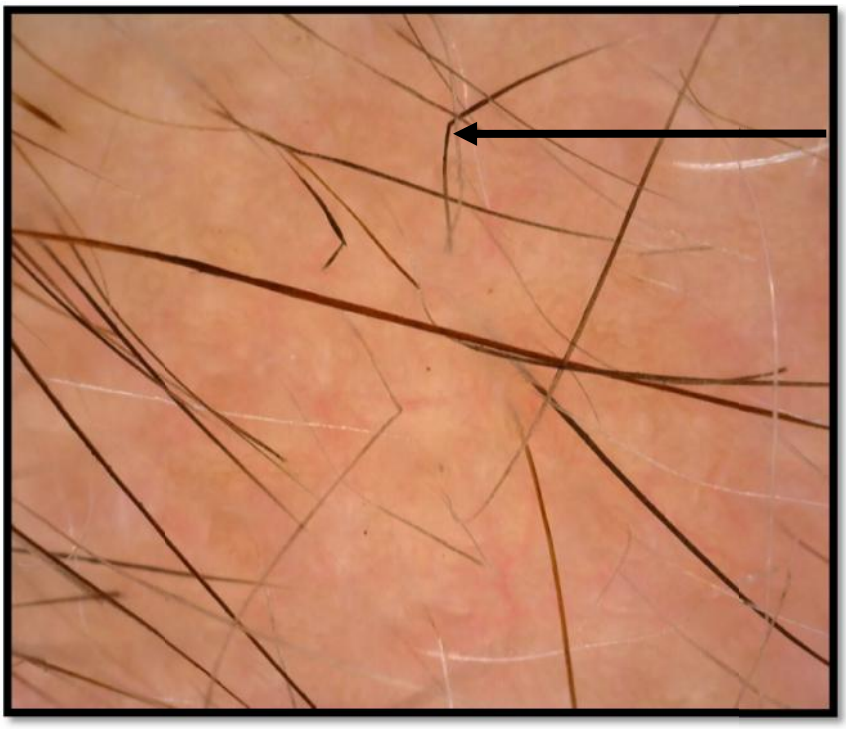


Figure 10: Coudability hair

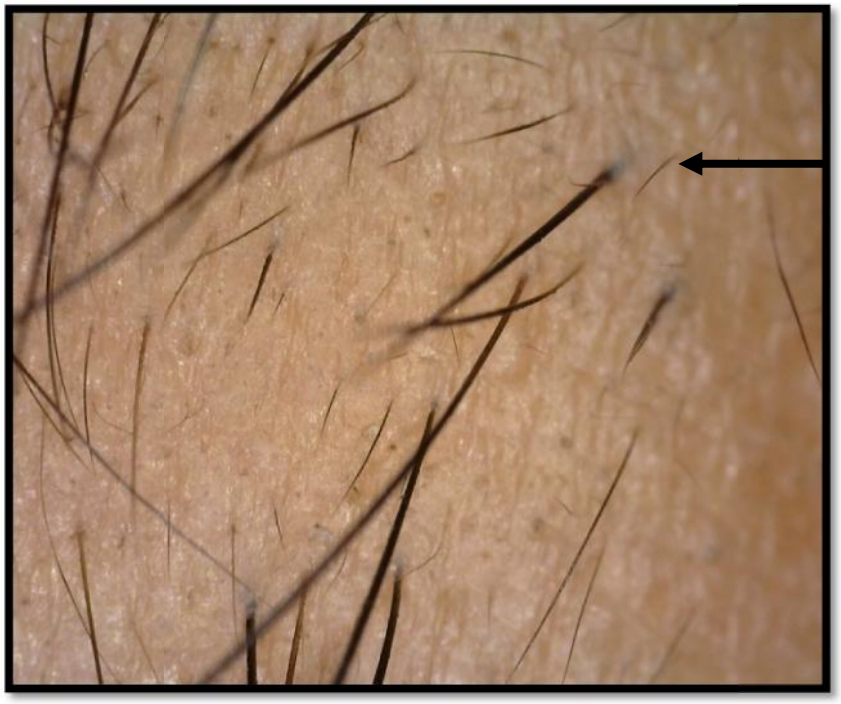


Figure 11: Vellus hair

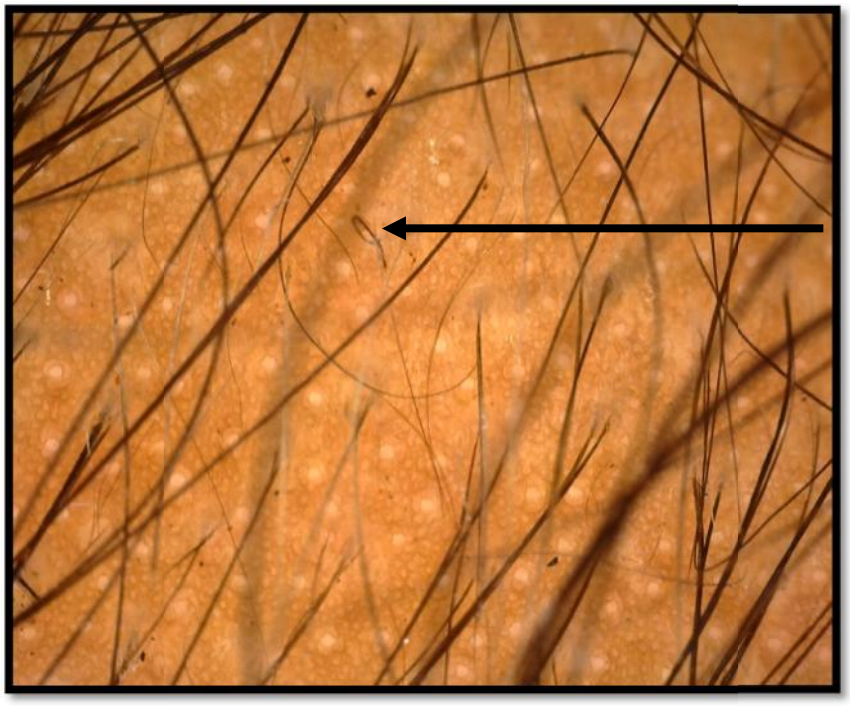


Figure 12: Pigtail hair

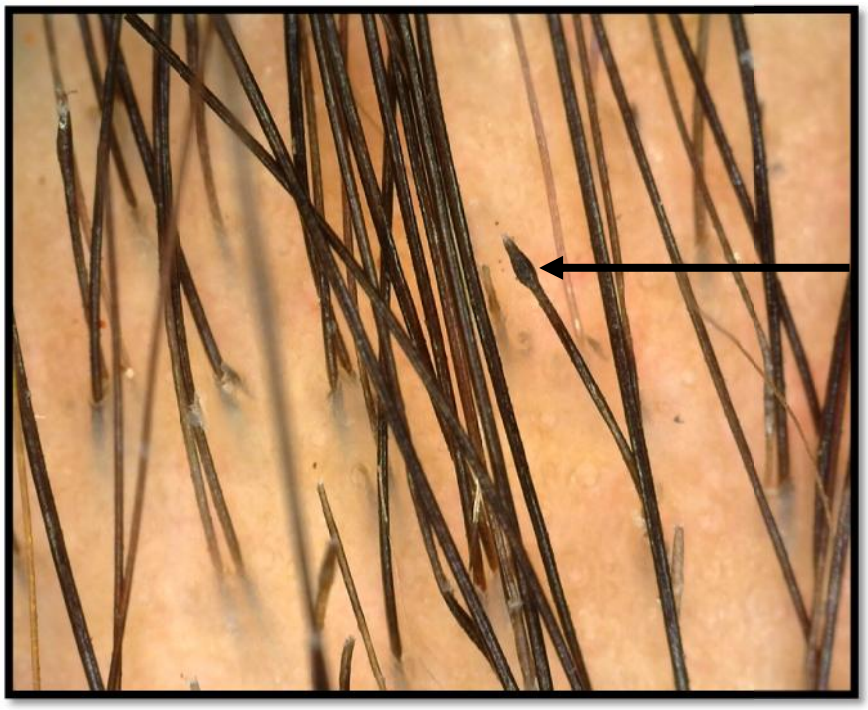


Figure 13: Tulip hair

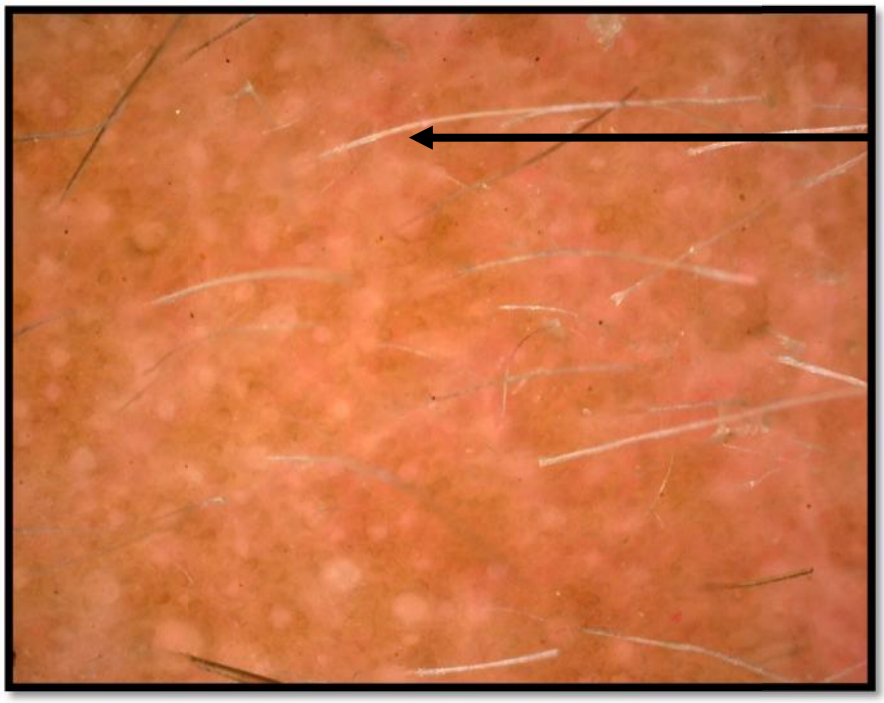


Figure 14: Leucotrichia

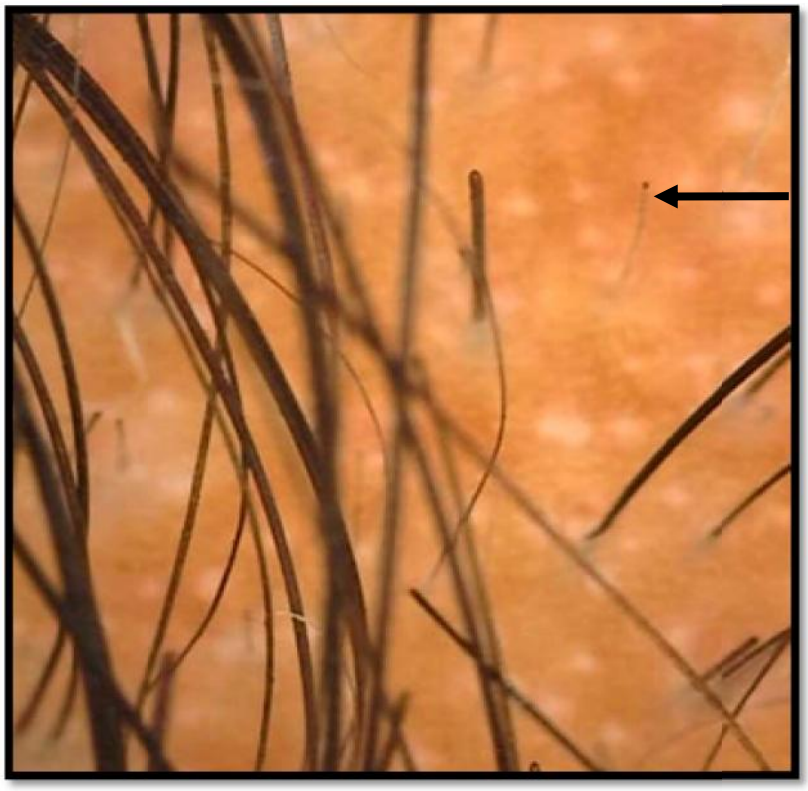


Figure 15: i - hair

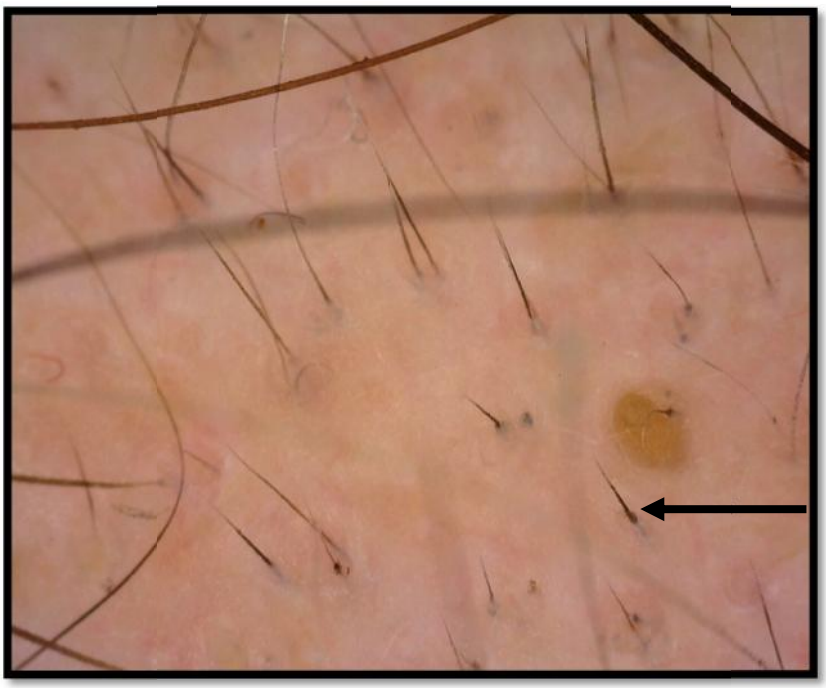


Figure 16: Upright regrowing hair

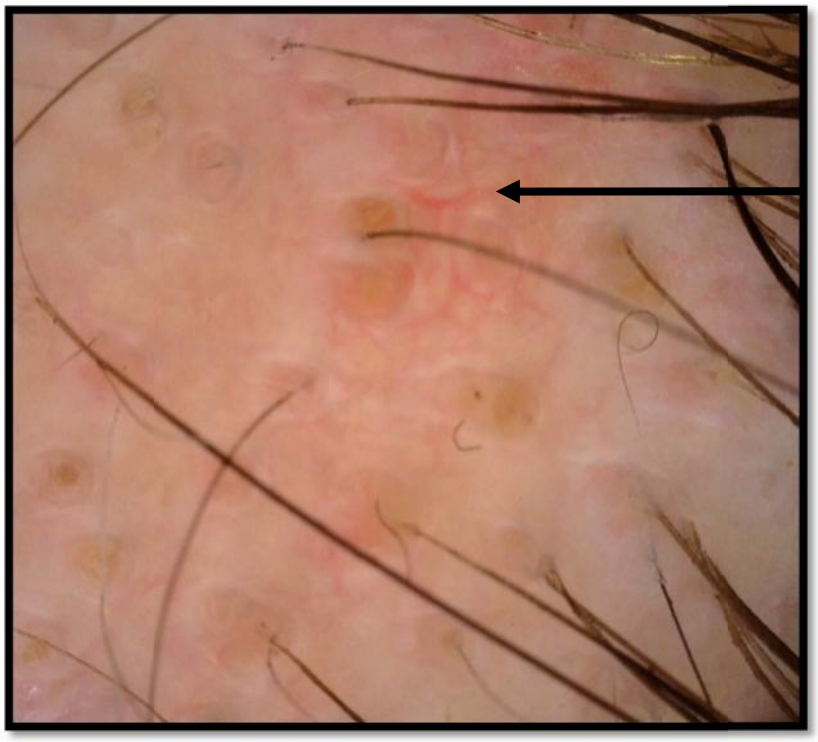


Figure 17: Arborizing vessels

ANNEXURES V - MASTER CHART

Case no	OP no	Age(y)	Sex	Duration of onset(D)	Sites	No of sites	No. of patches	Treatment history	Clinical pattern	Clinical activity	Follicular pattern				Hair pattern										Interfollicular pattern				Nail changes		Activity trichoscopically
											BD	YD	WD	EP	MICRO EMH	BH	CH	SVH	URH	PTH	MH	i-hair	TH	LT	HC	E	RL	ABV	PITTING	RIDGES	
1	4686981	32	F	180	SCALP	1	4	A	PATCHY	ACTIVE	P	A	A	A	P	A	P	A	P	A	A	A	A	A	A	P	A	P	A	A	ACTIVE & REGROWING
2	4697167	12	M	30	SCALP	1	3	P	PATCHY	ACTIVE	P	P	A	A	P	P	A	P	A	A	A	A	P	P	A	P	A	A	A	A	ACTIVE
3	4730561	28	M	60	SCALP	1	2	A	PATCHY	ACTIVE	A	P	A	A	P	A	A	A	A	A	P	A	A	P	P	P	A	A	A	A	ACTIVE
4		14	M	45	MOUSTACHE	1	1	A	PATCHY	INACTIVE	A	A	A	A	A	A	A	P	P	A	A	A	A	A	A	A	A	A	A	A	ACTIVE & REGROWING
5	4653865	20	M	15	SCALP	1	1	A	PATCHY	ACTIVE	A	A	A	P	P	A	P	P	A	A	A	A	A	A	P	A	A	A	A	A	ACTIVE
6	4707032	22	M	90	SCALP	1	3	P	PATCHY	ACTIVE	A	A	A	A	P	A	P	A	P	P	A	A	A	A	A	P	A	A	A	A	ACTIVE & REGROWING
7	4339613	10	M	730	…….	3	……	P	AU	INACTIVE	A	A	P	P	A	A	P	A	A	P	A	A	P	A	P	A	A	A	P	P	ACTIVE
8	4556723	23	M	45	BEARD	1	1	A	PATCHY	INACTIVE	A	A	A	A	A	A	A	P	P	A	A	A	A	A	A	A	A	A	A	A	REGROWING
9	4543418	45	F	120	SCALP	1	1	A	PATCHY	INACTIVE	A	A	A	A	A	A	A	P	A	P	A	A	A	A	A	A	A	A	A	A	INACTIVE
10	3189954	18	F	60	SCALP	1	1	A	PATCHY	ACTIVE	P	A	A	A	P	P	P	P	A	A	A	A	A	A	A	P	A	A	A	A	ACTIVE
11	4457858	21	F	730	SCALP	1	2	P	PATCHY	ACTIVE	A	A	P	P	A	A	A	P	A	P	A	A	A	A	A	A	A	A	A	A	ACTIVE
12	3210058	25	M	10	SCALP	1	2	….	PATCHY	ACTIVE	P	A	A	P	P	A	P	P	A	AA	A	A	A	A	P	A	A	A	A	A	ACTIVE
13		32	F	2555	FIVE SITES	5	…..	P	AU	ACTIVE	P	A	A	A	P	A	P	P	P	A	A	A	A	A	P	P	A	A	A	A	ACTIVE
14	2078074	8	M	60	SCALP	1	1	A	PATCHY	ACTIVE	P	A	A	P	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	ACTIVE
15		27	M	20	SCALP	1	3	A	PATCHY	ACTIVE	P	A	A	P	A	A	P	P	P	A	A	A	A	A	P	P	A	A	A	A	ACTIVE & REGROWING
16	4648530	15	M	30	SCALP	1	1	A	PATCHY	INACTIVE	A	A	A	P	P	P	A	P	P	P	A	A	A	A	P	A	A	A	A	A	ACTIVE & REGROWING
17	4666360	21	F	3650	SCALP	1	1	A	OPHIASIS	ACTIVE	P	P	A	P	A	A	P	P	P	A	A	A	A	A	A	P	A	A	A	A	ACTIVE

18	4723146	44	M	180	SCALP	1	2	P	PATCHY	INACTIVE	A	P	A	A	P	A	A	A	P	A	A	A	A	P	A	A	A	A	A	A	ACTIVE & REGROWING
19	4686975	28	F	2555	FIVE SITES	5	…..	P	AU	ACTIVE	P	A	A	P	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	P	A	INACTIVE
20	4730462	38	M	60	SCALP	1	3	P	PATCHY	ACTIVE	A	A	A	A	P	A	P	P	P	A	A	A	A	P	P	A	A	A	A	A	ACTIVE & REGROWING
21	3488365	8	F	90	SCALP	1	1	A	PATCHY	ACTIVE	A	P	A	A	P	A	P	P	P	P	A	A	A	A	P	A	A	A	A	A	ACTIVE & REGROWING
22	4737568	27	M	210	SCALP	1	1	P	PATCHY	INACTIVE	P	A	A	P	A	A	P	P	P	A	A	A	A	P	A	P	A	A	A	A	ACTIVE & REGROWING
23	4751641	27	M	30	SCALP	1	2	P	PATCHY	INACTIVE	A	P	A	P	A	A	A	P	A	A	A	A	A	A	A	P	A	A	A	A	INACTIVE
24	393253	20	M	730	SCALP	1	1	P	PATCHY	INACTIVE	P	P	A	A	A	A	P	A	P	A	A	A	A	A	P	P	A	A	A	A	ACTIVE & REGROWING
25	…..	14	F	730	…….	3	….	P	AU	ACTIVE	P	P	P	P	A	A	A	A	A	A	A	A	A	A	A	P	A	A	A	A	ACTIVE
26	4782856	28	M	60	SCALP	1	5	P	PATCHY	INACTIVE	A	P	A	P	A	A	P	P	P	A	A	A	A	A	P	P	A	A	A	A	ACTIVE & REGROWING
27	4793077	21	F	7	SCALP	1	5	P	PATCHY	ACTIVE	A	A	A	A	A	A	P	P	P	P	A	A	A	A	A	P	A	A	A	A	ACTIVE
28	4683292	20	F	30	SCALP	1	2	A	PATCHY	INACTIVE	A	A	A	P	A	A	P	P	P	A	A	A	A	A	P	A	A	A	A	A	ACTIVE
29	4790927	16	M	30	SCALP	1	1	A	PATCHY	INACTIVE	A	P	A	A	A	A	A	P	P	P	A	A	A	A	A	A	A	A	A	A	INACTIVE
30	4771622	25	M	180	SCALP	1	…..	P	OPHIASIS	INACTIVE	A	P	A	A	A	A	A	P	A	A	A	A	A	A	A	P	A	A	A	A	INACTIVE
31	4825421	54	M	20	MOUSTACHE	1	1	A	PATCHY	INACTIVE	A	P	A	A	A	A	A	A	A	A	A	A	P	P	A	A	A	A	A	A	INACTIVE
32	4781202	14	M	1095	SCALP	1	1	P	PATCHY	ACTIVE	P	A	A	A	P	A	P	A	A	A	A	A	A	A	P	P	A	A	A	A	ACTIVE
33	4847544	46	M	7	SCALP	1	1	A	PATCHY	ACTIVE	P	P	A	P	A	A	A	A	A	P	A	A	A	A	A	A	A	P	A	P	ACTIVE
34	962287	51	M	547	SCALP	1	2	P	PATCHY	ACTIVE	P	P	A	A	P	A	P	A	P	A	A	A	A	A	P	A	A	P	P	A	ACTIVE & REGROWING
35	4935391	35	F	180	SCALP	1	2	P	PATCHY	ACTIVE	P	P	A	P	A	A	P	P	A	A	A	A	A	A	A	P	A	A	A	A	ACTIVE
36	4885209	16	F	90	SCALP	1	2	A	PATCHY	ACTIVE	P	P	P	P	A	A	P	P	P	A	A	A	A	A	A	P	A	A	A	A	ACTIVE
37	4884124	5	M	730	FIVE SITES	3	6	P	PATCHY	ACTIVE	P	A	P	A	A	A	P	A	A	A	A	A	A	A	P	A	A	A	A	A	ACTIVE
38	2549093	26	M	30	BEARD	1	1	A	PATCHY	INACTIVE	P	P	A	A	A	P	A	P	A	A	A	A	A	A	A	A	A	A	A	A	ACTIVE
39	5040304	37	M	180	BEARD	1	1	P	PATCHY	INACTIVE	P	P	A	A	A	A	A	A	A	A	A	A	A	A	A	P	A	A	A	A	ACTIVE
40	5046506	36	F	30	SCALP	1	1	A	PATCHY	ACTIVE	P	A	A	A	A	A	A	P	A	A	A	A	A	A	A	A	A	A	A	A	ACTIVE
41	4941721	6	F	210	SCALP	1	…..	P	OPHIASIS	ACTIVE	P	A	P	P	A	A	A	P	A	A	A	A	A	A	A	P	A	A	P	A	ACTIVE
42	5076910	22	M	90	SCALP	1	1	P	PATCHY	ACTIVE	P	A	A	A	P	P	P	A	A	A	A	A	A	A	A	P	A	A	A	P	ACTIVE
43	5083408	29	M	1095	SCALP	1	8	P	PATCHY	INACTIVE	P	P	A	A	A	A	P	A	A	A	A	A	P	A	P	A	A	A	A	A	ACTIVE
44	509234	14	F	3650	SCALP	1	4	P	PATCHY	INACTIVE	P	P	A	A	P	A	P	A	A	P	A	A	P	A	A	A	A	A	A	A	ACTIVE
45	5095447	21	M	60	SCALP	1	1	P	PATCHY	ACTIVE	A	P	A	A	P	A	P	A	A	A	A	A	A	A	A	A	A	A	A	A	ACTIVE
46	4865538	19	M	60	SCALP	1	3	P	PATCHY	ACTIVE	P	A	A	A	P	P	A	A	P	A	A	A	A	A	A	A	A	A	A	A	ACTIVE & REGROWING
47	4865538	17	M	365	SCALP	1	4	P	PATCHY	INACTIVE	P	A	A	A	A	A	A	A	P	P	A	A	A	A	A	A	A	P	A	A	ACTIVE & REGROWING
48	3975460	25	F	30	SCALP	1	1	P	PATCHY	ACTIVE	A	A	A	A	A	P	A	A	P	A	A	A	P	A	P	P	A	A	A	A	ACTIVE & REGROWING

49	1412102	70	M	30	L. EYWBROW	1	1	A	PATCHY	INACTIVE	P	A	A	A	A	A	P	A	A	A	A	A	A	P	A	A	A	A	A	A	ACTIVE
50	5185605	19	M	30	SCALP	1	4	A	PATCHY	ACTIVE	P	P	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	ACTIVE
51	5187324	14	M	15	SCALP	1	1	A	PATCHY	INACTIVE	P	P	A	P	P	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	ACTIVE
52	4619470	28	F	7	SCALP	1	1	A	PATCHY	ACTIVE	P	P	A	A	A	A	A	A	A	A	A	A	A	A	A	P	A	A	A	A	A	ACTIVE
53	5205850	21	M	7	SCALP	1	1	A	PATCHY	ACTIVE	P	P	A	A	A	A	A	A	A	A	A	P	A	A	A	A	A	A	A	A	A	ACTIVE
54	5212060	28	F	3	SCALP	1	1	A	PATCHY	ACTIVE	P	P	A	A	P	A	P	A	P	A	A	A	A	A	A	P	A	A	P	A	A	ACTIVE & REGROWING
55	5141000	32	M	1460	FIVE SITES	5	…	P	AU	ACTIVE	A	P	A	A	A	A	P	A	P	A	A	A	A	A	A	A	P	A	A	P	P	ACTIVE & REGROWING
56	5224085	30	M	30	SCALP	1	4	P	PATCHY	INACTIVE	P	P	A	A	A	A	A	P	A	A	A	A	A	A	A	A	A	A	A	A	A	ACTIVE
57	5291948	14	M	15	SCALP	1	1	A	PATCHY	INACTIVE	P	P	A	A	P	P	P	A	A	A	A	A	A	A	A	A	A	A	A	A	A	ACTIVE
58	5257488	26	M	547	SCALP	1	2	P	PATCHY	INACTIVE	P	A	A	A	A	A	A	A	P	A	A	A	A	A	A	P	A	A	P	A	P	REGROWING
59	5267175	25	F	730	SCALP	1	….	P	DIFFUSE	ACTIVE	P	P	A	P	A	A	P	A	A	A	A	P	A	A	P	A	A	P	P	A	ACTIVE
60	5261015	38	F	3650	FIVE SITES	3	…..	P	OPHIASIS	INACTIVE	A	A	P	A	A	A	P	A	A	A	A	A	A	A	A		A	A	A	A	A	ACTIVE

ANNEXURE-VI

KEY TO MASTER CHART

SEX

- M – MALE
- F – FEMALE

SITES

- FIVE SITES – SCALP, EYEBROWS, EYELASHES, AXILLA, PUBIC HAIR

FOLLICULAR PATTERN

- BD- BLACK DOTS
- YD- YELLOW DOTS
- WD- WHITE DOTS
- EF- EMPTY FOLLICLES

HAIR PATTERN

- MICRO-EMH- MICRO EXCLAMATION MARK HAIR
- BH - BROKEN HAIR
- CH - COUDABILITY HAIR
- SVH – SHORT VELLUS HAIR
- URH – UPRIGHT REGROWING HAIR
- MH – MONOLITHRIX HAIR
- PTH – PIG TAIL HAIR
- LT – LEUCOTRICHIA
- TH – TULIP HAIR

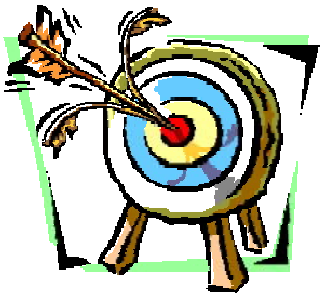
INTER-FOLLICULAR PATTERN

- HC – HONEY COMB PATTERN
- E – ERYTHEMA
- RL – RED LOOPS

A – ABSENT

P – PRESENT

Introduction



Objectives

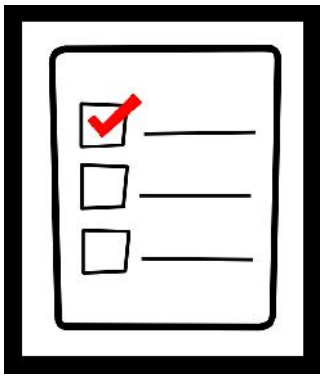
Review of Literature

Methodology

Results

Discussion

Conclusion

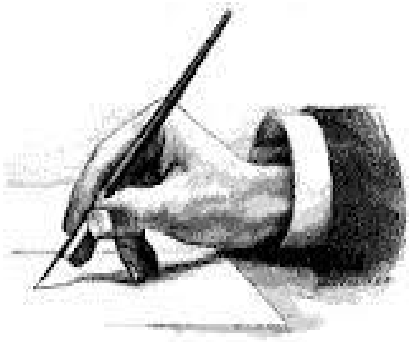


Limitations

Recommendations

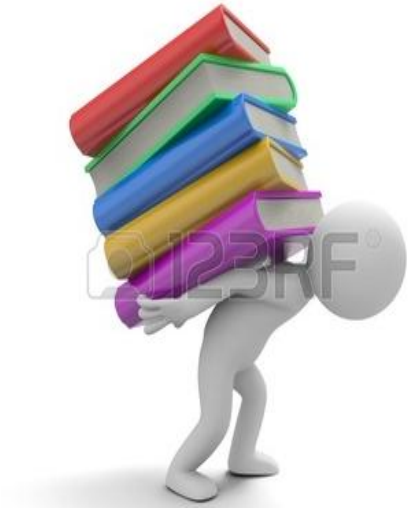
Summary

Bibliography



Annexure-I

Annexure-II



Annexure-III

Annexure-IV

Annexure-V