“A PROSPECTIVE STUDY OF THYROID FUNCTION TEST IN GERIATRIC POPULATION AND ITS CLINICAL CORRELATION”

REG NO. BG0116010

Dissertation

Submitted to the
KLE Academy of Higher Education and Research,
Belagavi, Karnataka

In Partial Fulfillment
of the requirements for the degree of

M. D.
in
GENERAL MEDICINE

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ENDORSEMENT BY HOD, PRINCIPAL/ HEAD OF THE INSTITUTION

This is to certify that the dissertation entitled **"A PROSPECTIVE STUDY OF THYROID FUNCTION TEST IN GERIATRIC POPULATION AND ITS CLINICAL CORRELATION"** is a bonafide research work done by the **CANDIDATE REG NO. BG0116010**.

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LIST OF ABBREVIATIONS USED

µg/dL	-	Micrograms per deciliter
^{0}F	-	Degree Fahrenheit
A.D	-	Anno Domini
AF	-	Atrial fibrillation
AJCC TNM	-	American Joint Committee on Cancer Tumor Node Metastasis
ATA	-	American Thyroid Association
ATC	-	Anaplastic (undifferentiated) thyroid carcinoma
BETS	-	Birmingham Elderly Thyroid Study
BMI	-	Body mass index
bpm	-	Beats per minute
CHD	-	Coronary heart disease
CI	-	Confidence interval
cm	-	Centimeters
CNS	-	Central nervous system
CT	-	Computed tomography
CVS	-	Cardiovascular system
FNA	-	Fine needle aspiration
FNAC	-	Fine needle aspiration cytology
FT3	-	Free triiodothyronie
FT_4	-	Free thyroxine
FTC	-	Follicular thyroid carcinoma
g	-	Grams
HPT	-	Hypothalamo–pituitary–thyroid

i.e.,	-	That is
IU/mL	-	International units per milli liter
Kg/m^2	-	Kilograms per square meter
LDL	-	Low density lipoprotein
mcg/dL	-	Micrograms per deciliter
mcIU/mL	-	Microinternational units per milli liter
mIU/l	-	Micro international units per litre
ml	-	Milli liter
mL	-	Millilitre
mm Hg	-	Millimeters of mercury
MTC	-	Medullary thyroid carcinoma
n	-	Number of patients
ng/mL	-	Nanograms per milli liter
NHANES	-	National Health and Nutrition Examination Survey
OR	-	Odds ratio
p	-	Probability
PA	-	Per abdomen
PBI	-	Protein bound iodine
PTC	-	Papillary thyroid carcinoma
R.S.	-	Respiratory system
rT3	-	Reverse T3
SD	-	Standard deviation
SEER	-	The Surveillance, Epidemiology, and End Results
T. Chol	-	Total cholesterol
T3	-	Triiodothyronine

T4	-	Thyroxine
TBG	-	Thyroxine-binding globulin
TBPA	-	Thyroxine binding pre-albumin
TFT	-	Thyroid function test
TGs	-	Triglycerides
TPO AB	-	Thyroperoxidase antibody
TPO	-	Thyroperoxidase
TPOAb	-	Antithyroid peroxidase antibody
TRH	-	Thyrotrophic-releasing hormone
TSH	-	Thyroid stimulating hormone
TT3	-	Total triiodothyronine
TT4	-	Total thyroxine
U.S.	-	United states
UK	-	United Kingdom
UN	-	United Nations
USG	-	Ultrasound
vs.	-	versus
WHO	-	World health organization
yr	-	Year

ABSTRACT

Background and objectives

There is limited data regarding the prevalence of thyroid disorders in elderly from India. This study was an attempt to assess the thyroid function tests in elderly population and to correlate them with clinical symptoms.

Methodology

This one year hospital based crosssectional study was done in the Outpatient Department, Department of General Medicine and Geriatric Medicine, KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi on a total of 100 elderly patients who presented for regular checkups with clinical suspicion of thyroid disorders from January 2017 to December 2017. The selected patients were investigated for T3, T4, TSH and thyroid antibodies.

Results

Majority of the patients were females (67%) and the male to female ratio was 1:2.03. The mean age was 67.69±7.21 years. The mean T3 levels were 1.32±0.88 ng/mL, the mean T4 levels were 7.69±4.13 µg/mL and mean TSH levels were 12.31±22.82 mcIU/mL. The mean TPO antibodies were noted as 95.97±211.82 IU/mL. Thyroid abnormalities were diagnosed in 28% of the patients and hypothyroidism was the most common thyroid abnormality noted in 12% of the patients. No association was found between thyroid abnormalities and sex (p=0.349) as well as age (p=0.946). Easy fatiguability (94%) and generalized weakness (93%) were the common clinical complaints and mild pallor was the common clinical sign noted in 26% of the patients followed by dry/coarse skin in

25% of the patients. Thyroid abnormalities were significantly associated with easy fatiguability, generalized weakness, swelling of limb/face, weight gain, constipation and with clinical signs of pallor, dry/coarse skin, hoarseness, ankle jerk and oedema. Family history of thyroid disorders was reported by 47% of the patients and it was significantly associated with of thyroid disorders (p=0.001).

Conclusion and interpretation

There is higher incidence of thyroid abnormalities among elderly population in the study area and overt hypothyroidism is the common thyroid abnormality.

Keywords

Thyroid abnormalities; Thyroid function tests; Thyroid function; Hypothyroidism; Hyperthyroidism; Subclinical hyperthyroidism; Subclinical hypothyroidism

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INTRODUCTION

Thyroid gland is unique among endocrine organs as it is the largest endocrine gland in the body and the first to develop in fetal life. Even after 100 years, thyroid gland has been the subject of intense research and considerable attention due to the vast array of developmental, inflammatory, hyperplastic and neoplastic disorders which are exceedingly common in clinical practice.[1]

Thyroid hormone, thyroxine along with much lesser amount of tri-iodothyroxine is secreted by the thyroid gland under the influence of the hypophyseal thyrotropin releasing hormone and thyroid stimulating hormone of anterior pituitary.[2,3] Thyroxine is the main hormone of the thyroid gland and about 80 mcg of it is secreted per day. Thyroid secretes only 4 mcg per day of tri-iodothyrxine.[4] Normally about 93% of the thyroid hormone released is thyroxine and approximately 7% of the thyroid hormone released is tri-iodothyroxine.[5] Low Triiodothyronine (T3) syndrome is a condition with impaired peripheral conversion of Thyroxine (T4) to T3.[4] Inappropriate secretion of thyroid hormones may occur in many thyroid disorders. In primary hypothyroidism T3 and T4 is suppressed while TSH concentration is high. While in primary hyperthyroidism T3 and T4 concentration is high while TSH is suppressed.[6]

However, aging changes occur in all body systems including the endocrine system. These changes may be due to the decreased amount of hormones secreted or the decreased sensitivity of target organs.[7] Thyroid disease is frequent in older individuals, and symptoms of hypothyroidism such as tiredness, fatigue, lack of concentration, or dry skin can be very similar to complaints associated to aging.[8,9]

Even for hyperthyroidism, clinical presentation in elderly people is much more silent when compared to middle-aged people. [10]

In elderly individuals the non specific clinical manifestations of hypo and hyperthyroidism also cause confusion in the clinical setup. On the other hand the value of thyroid profile may move outside the normal ranges applicable to younger age group.[11] In sub-clinical hyperthyroidism the levels of T3 and T4 hormones are normal but TSH is low.[12] Similarly high TSH with normal T3 and T4 hormones indicate hyperactivity of TSH as a result of defective negative feedback mechanism.[13,14]

All over the world the elderly population is growing continuously and it is projected that in the next few decades, most of the elderly people will be in the developing countries. Improvement in living standards and better medical facilities has led to a decline in mortality and higher life expectancy among geriatric population. 2001 census has shown that the elderly population of India accounted for 77 million. The elderly population aged 70 and above, which was only 8 million in 1961 rose to 21 million in 1991 and to 29 million in 2001. Ageing leads to number of medical problems, which could be attributed to various physiological changes occurring in all organs of the body.[15,16]

Over the past few decades, there has been a dramatic increase in the percentage of older people in the general population. People over the age of 65 accounted for 35.9 million (12.3%) of the total United States (U.S.) population in 2003, and their numbers are projected to increase to 71.5 million by 2030. In India 60 years and above is considered as geriatric population. According to the World

health organization (WHO) and United Nations (UN), 2001, people aged 45-59 years are considered "middle aged" and those above 60 years are considered to be geriatrics, though there is no fixed or mandatory criteria or guideline. The recent estimates by countrymeters, as of the beginning of 2018, there are about 73,766,328 persons above 64 years old (35,083,655 males/38,682,673 females) which translates into 5.5% of the total population.[17]

However, Indian statistics regarding thyroid dysfunction in elderly is sparse. There has been long standing controversy about the thyroid function test results in the elderly.[18] The levels of TSH, free T4 and free T3 hormone concentrations change with aging.[19] Also, thyroid disorders increase morbidity and mortality in elders, so dictation of thyroid disorders in elderly become very important. Several thyroid function abnormalities are observed in the elderly.[9] Hence, health care professionals should have awareness about the thyroid profile changes that distinguish older from younger patients, because these changes bring new challenges in clinical care resulting from the special needs associated with both normal aging and its related chronic illnesses. Epidemiologic studies have shown a remarkable increase in the incidence and prevalence of thyroid disorders in older populations.[20]

Furthermore, older and more recent studies provide evidence that mild thyroid dysfunction may represent a significant health problem for the elderly. Subclinical hyperthyroidism appears to be a significant risk factor for all cause and cardiovascular mortality in subject aged from 55 to 60 years to the oldest old.[9] Subclinical hypothyroidism might be also associated with increased mortality in middle-aged and young elderly.[9] Considering these facts the present study was

planned to assess the thyroid function tests in elderly population and to correlate clinical symptoms with abnormal thyroid function.

OBJECTIVES

The objectives of this study were;

- To assess the thyroid function tests in elderly population.
- To correlate clinical symptoms with abnormal thyroid function.

REVIEW OF LITERATURE

Historical aspects[21,22]

The thyroid gland was previously referred to as a laryngeal gland and was subsequently named thyroid by Wharton in 1645. Existence of thyroid gland was known to Galen (A.D), who thought that it provided fluid for lubrication of larynx.

Sir Astley Cooper (1768-1841) said it has the function of secretion. Thyroxine (T4) was isolated by Kendall in 1965 and it was synthesized by the Harrington and Banger in 1927. In 1953 the important discovery of 3, 5, 3 Tri-iodothyronine was made by Cross and Pitt-rivers and by Roche, Liesitsky and Michel simultaneously. This was proved to be more effective than thyroxine itself. With the introduction of radioactive iodine in 1934, it was possible for the clear understanding of thyroid physiology.

In 1986, Bouman discovered Iodine in considerable amount in thyroid gland. Iodine was first identified by French Chemist Courtisis in 1812 who found it in ash of burnt seaweed.

Anatomy[22-24]

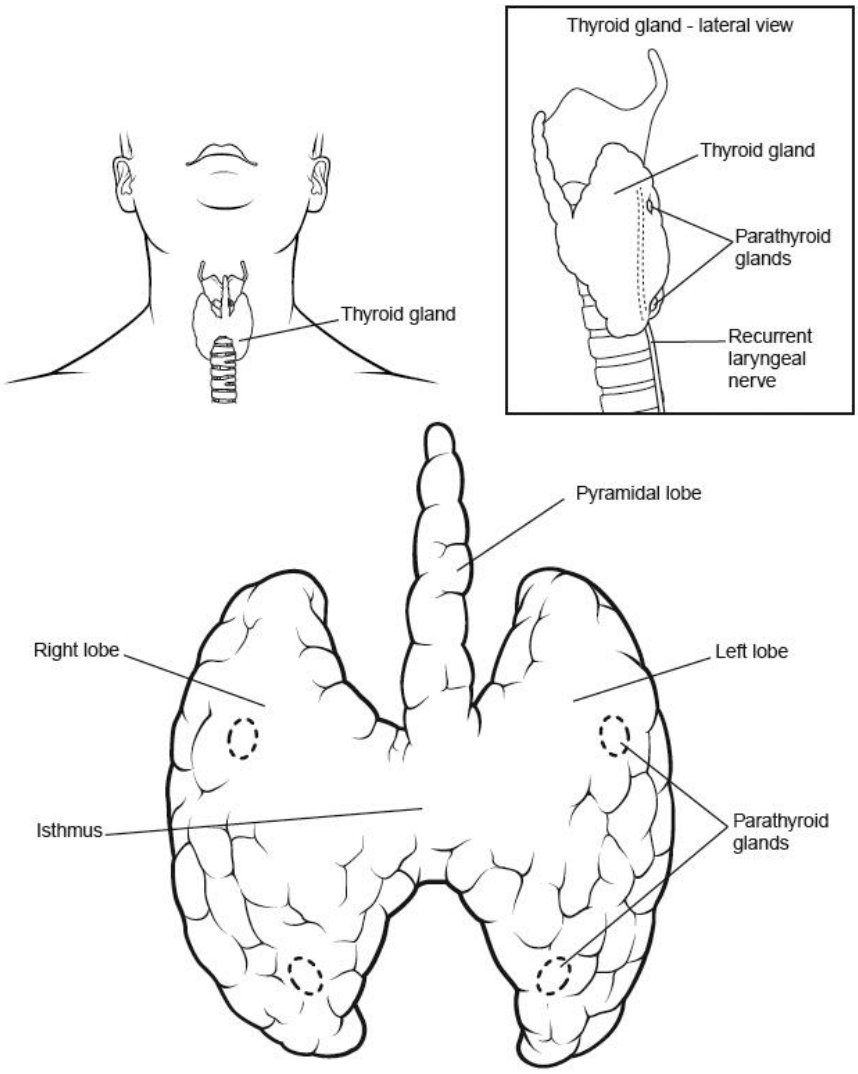


Figure 1. Thyroid gland, anterior and lateral view

The thyroid is a highly vascular, brownish-red gland located anteriorly in the lower neck, extending from the level of the fifth cervical vertebra down to the first thoracic. The gland varies from an H to a U shape and is formed by two elongated lateral lobes with superior and inferior poles connected by a median isthmus, with an average height of 12 to 15 mm, overlying the second to fourth tracheal rings.[24,25]

Although thyroid weight varies, it averages 20 gm in adults (it is slightly heavier in women). Usually, two pairs of parathyroid glands lie in proximity to the thyroid gland.

Innervation of the thyroid

Principal innervation of the thyroid gland derives from the autonomic nervous system. Parasympathetic fibers come from the vagus nerves, and sympathetic fibers are distributed from the superior, middle, and inferior ganglia of the sympathetic trunk.

Structure

Under the middle layer of deep cervical fascia, the thyroid has an inner true capsule, which is thin and adheres closely to the gland. Extensions of this capsule within the substance of the gland form numerous septae, which divide it into lobes and lobules. The lobules are composed of follicles, the structural units of the gland, which consist of a layer of simple epithelium enclosing a colloid-filled cavity.

The colloid (pink on hematoxylin and eosin) contains an iodinated glycoprotein, iodothyroglobulin, a precursor of thyroid hormones. Follicles vary in size, depending upon the degree of distention, and they are surrounded by dense plexuses of fenestrated capillaries, lymphatic vessels, and sympathetic nerves.

Epithelial cells are of 2 types: principal cells (follicular) and parafollicular cells (C, clear, light cells). Principal cells are responsible for formation of the colloid (iodothyroglobulin), whereas parafollicular cells produce the hormone calcitonin, a

protein central to calcium homeostasis. Parafollicular cells lie adjacent to the follicles within the basal lamina.

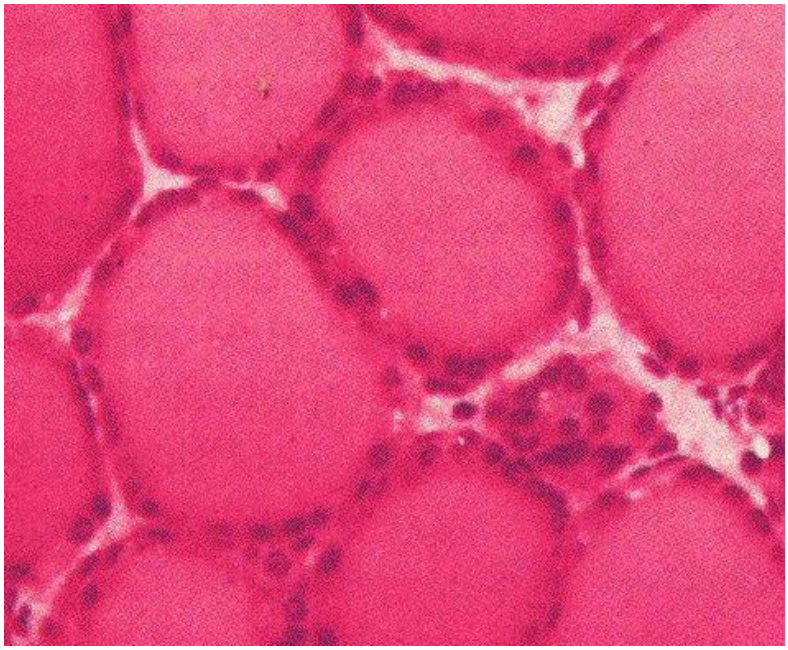


Figure 2. Follicles of the thyroid gland, consisting of a layer of simple epithelium enclosing a colloid-filled cavity

Vascular Anatomy

The arterial supply to the thyroid gland comes from the superior and inferior thyroid arteries and, occasionally, from the thyroidea ima. The superior thyroid artery is a branch of external carotid artery and enters into superior pole of each thyroid lobe. The inferior thyroid artery is larger and more important and arises from the subclavian artery and enters from a posterolateral position.

Venous Drainage and Lymphatics

Three pairs of veins provide venous drainage for the thyroid gland. The superior thyroid vein and the middle thyroid vein joins internal jugular vein and the inferior thyroid vein empty into innominate vein.

Lymphatic drainage of the thyroid gland is extensive and flows multidirectionally. Immediate lymphatic drainage courses to the periglandular nodes, to the prelaryngeal (Delphian), pretracheal, and paratracheal nodes along the recurrent laryngeal nerve and then to mediastinal lymph nodes. Regional metastases of thyroid carcinoma can also be found laterally, higher in the neck along the internal jugular vein. This can be explained by tumor invasion of the pretracheal and paratracheal nodes causing an obstruction of normal lymph flow.

Physiology[5,26]

The primary function of thyroid gland is the production of sufficient thyroid hormones for proper regulation of cellular metabolism throughout the body.

Iodine metabolism

Iodine is taken in the form of Iodides. Sea fish, egg and milk are good dietary sources of iodide.

The adult man requires 0.14 mg of iodide per day and an adult female requires 0.10 mg. Growing children, pregnant and lactating women require more.

Synthesis and secretion of thyroid hormones[4]

The synthesis of thyroid hormones is divided into four steps:

- Iodine trapping
- Iodine binding
- Coupling
- Hormonal release

Thyroglobulin is first taken up by thyroid follicular cells. From the follicular cells T4 and T3 directly enter the circulation under the influence of TSH. On entering the circulation the thyroid hormones are largely bound to specific protein called thyroxine-binding globulin (TBG), thyroxine binding albumin and thyroxine binding pre-albumin (TBPA).

This protein has got more affinity to Thyroxine than to the tri-iodothyronine. The protein bound iodine (PBI), which is about 4-8 g per 100 ml mainly, reflects plasma T4 level. A small amount of hormone remains free in the serum in equilibrium with the protein bound hormone and is biologically active.

Differences between T3 and T4

T3 has quicker onset of action and is effective in very small doses. The onset of action of T3 is within 6-8 hours and that of T4 is 4-14 days.

Effects of thyroid hormones on metabolic processes

Effect on calorigenesis

One classic action of thyroid hormones is their stimulating effect on calorigenesis. The precise mechanism of calorigenic effect of thyroid hormones is uncertain.

Effects on protein metabolism

Thyroid hormones stimulate protein synthesis and thus increased protein synthesis may be fundamental to many of the metabolic actions of the hormone.

Effects on carbohydrate metabolism

Many of their influences are dependent upon or modified by other hormones, in particular catecholamines and insulin. Thyroid hormones increase glycogen synthesis and peripheral utilization of glucose and thus potentiate in this respect.

Effects on lipid metabolism

Thyroid hormones appear to stimulate all aspects of lipid metabolism including synthesis, metabolism and degradation.

Effects on vitamin metabolism

In hyperthyroidism, the requirement of water-soluble vitamins such as Thiamine, Vitamin B12 and vitamin C are increased and their tissue concentrations are reduced.

<u>Theories concerning the mechanism of action of thyroid hormones</u>

- Uncoupling of oxidative phosphorylation at mitochondria.
- Increased activity of Na+, K+ dependent ATPase.
- Increased synthesis of specific enzymes.
- Stimulation of adenyl cyclase at plasma membrane.

Regulation of thyroid function

Thyroid function is regulated by two mechanisms, namely suprathyroid and intrathyroid. The suprathyroid regulation is by thyroid stimulating hormone (TSH) released from basophilic cells of the anterior pituitary. TSH stimulates thyroid hypertrophy and hyperplasia. All steps in the synthesis and secretion of thyroid hormones are enhanced and the synthesis of thyroglobulin is increased. These actions of TSH are due to binding of hormone to receptors on thyroid follicular cell membrane. Regulation of TSH secretion is by two opposing mechanisms.

The thyrotrophic-releasing hormone (TRH) of hypothalamic origin stimulates synthesis and secretion of TSH and thyroid hormones. TRH is synthesized in the hypothalamus, reaches anterior pituitary by portal blood system and binds to receptor on thyrotrophic cells. This is called pituitary – thyroid axis. The intrathyroidal regulation is also called autoregulatory mechanism, but this is not to mean that thyroid controls hormone production in the absence of TSH stimulation. The gland reduces the iodine trapping mechanism, whenever, there is sudden increase in the supply of iodide and this occurs without the negative feedback mechanism.

Changes in thyroid anatomy and physiology with aging

As age advances, the thyroid gland undergo progressive fibrosis and atrophy,[27,28] leading to reduction in thyroid volume, making it difficult to palpate. Prevalence of autoantibodies increases with age, reaching up to 20% in women over the age of 60 years, and may be partly responsible for the anatomic changes in the thyroid gland.[29] Neoplastic lesions in the thyroid increase with age, making it more

nodular. Thyroid hormone synthesis is regulated by the hypothalamo–pituitary–thyroid (HPT) axis and iodide status in the body. The HPT axis is intact in regulating thyroid synthesis even in the elderly. Iodide status in the elderly is low compared with young adults due to dietary restrictions of salt and decreased absorption due to comorbid conditions.[28]

Many population- and hospital-based studies[28-30] have examined the age-related changes in thyroid functions. Thyroidal iodine uptake decreases with age, leading to decreased T4 secretion in the elderly. This reduction in T4 secretion is compensated by decreased T4 metabolic clearance due to decreased 5'deiodinase activity with advanced age. Age-related decline in T3 is demonstrated only in a few studies, and that too only after the age of 90 years. This reduction in T3 is due to decreased T4 synthesis with age and decreased activity of 5' deiodinase. The inactive metabolite reverse T3 (rT3) seems to increase with age. Studies using highly sensitive thyroid-stimulating hormone (TSH) assays show an age-dependant decline in TSH. Thyroid binding globulin level decreases with age and, therefore, measurement of free thyroid hormones is more useful in the elderly.[28]

Thyroid function in elderly

The endocrine system and particular endocrine organs, including the thyroid gland, undergo – similarly to other organ systems – crucial functional changes with aging. Numerous morphological and physiological changes of the thyroid during the process of aging are well-known.[31] A specificity of thyroid diseases in the elderly, differing essentially from that observed in younger subjects, relies on the presence of more subtle symptoms which are often attributed to normal aging. Therefore,

subclinical hypo- and hyperthyroidism, as well as thyroid neoplasms, the prevalence of which increases with age, require special attention in elderly subjects. Interestingly, altered thyroid function may contribute to the extended longevity.[31]

Several studies have investigated the role of thyroid function in the aging process.[32] Studies have shown increased serum TSH levels with increasing age, independent of antithyroid antibody presence,[33] while in contrast, others have demonstrated decreased serum TSH in older adults[7,34] Populations in which the dominant thyroid pathology is thyroid deficiency secondary to Hashimotos' thyroiditis display a trend for the TSH upper limit to increase with age.[35,36] On the contrary, an inverse relationship between TSH and age is seen in iodine-deficient populations in which the dominant thyroid pathology is nodularity and increasing thyroid autonomy with age.[37] In regards to free T3 levels, most studies have demonstrated an age-dependent decline, while free T4 levels remain relatively unchanged[7,34] and rT3 levels increase with increasing age. However, interpretation of thyroid function tests in older adults is often complicated by the presence of chronic illness (where free T3 can be low and rT3 high) and polypharmacy.[38] Furthermore, differences in iodine intake and the presence of autoimmune thyroid disease make the distinction between age-related and disease-related thyroid function abnormalities even more challenging.[39]

There is convincing evidence that higher levels of TSH are associated with longevity.[32] Atzmon G. et al.[40] concluded that serum TSH levels were significantly higher in centenarians (mean age=98 years) as compared to controls ($p<0.001$). Several other studies[41,42] have also shown increased TSH levels (mean age=85 years) and low to low-normal FT4 levels (mean age=78 years) to be associated with

a better survival in older adults. It is hypothesized that the association of a higher TSH level with longevity may be due to a correlated lower bioactivity of thyroid hormone, which in turn leads to a lower basal metabolic rate and thus potentially may serve as an adaptive mechanism to prevent catabolism in older adults.[42] Moreover, the offspring of individuals with longevity were also shown to have higher TSH levels than age-matched controls without familial longevity (mean age=70 years), indicating a genetic predisposition.[43]

Thyroid dysfunction with aging

The process of aging affects both the prevalence and clinical presentation of hypo- and hyperthyroidism. Importantly, subclinical disturbances of thyroid function are more frequent than overt diseases in general population, as well as in elderly people. Consistently, the prevalence of subclinical hypothyroidism, which is characterized by normal free thyroxine (FT_4) and elevated thyrotropin (TSH) levels, increases with aging and ranges from 3 to 16% in individuals aged 60 years and older.[31]

Although it is known that overt thyroid disorders negatively affect physical and cognitive function in elderly people – for example, overt hypothyroidism is associated with the impairment of attention, concentration, memory, perceptual functions, language, and executive functions, subclinical hypothyroidism is not associated with impairment of physical and cognitive function or depression in individuals aged 65 years and older, as compared to euthyroidism.[31]

Also Park et al.[44] have demonstrated that subclinical hypothyroidism in elderly subjects is neither associated with cognitive impairment, depression, poor

quality of life nor with metabolic disturbances. On the other hand, other studies demonstrated the presence of – at least – mild cognitive impairment in people with subclinical hypothyroidism at mean age under 65 years.

Furthermore, as reported by de Jongh et al.,[45] subclinical hypothyroidism was also not associated with the increased overall mortality risk.

Similar findings were shown by Rodondi et al.[46] who analyzed data from numerous large prospective cohorts and demonstrated that total mortality was not increased in subjects with subclinical hypothyroidism, although the risk of coronary heart disease (CHD) events and of CHD mortality increased with TSH levels 10 mIU/l or higher. Nevertheless, it should be emphasized that this analysis regarded numerous different populations (cohorts) which consisted of not only elderly people and that the effect in question, i.e. of increasing TSH level on CHD incidents was not influenced by age.

Undoubtedly, there are obvious indications for treatment of overt hypothyroidism. On the other hand, indications for treatment of subclinical hypothyroidism are still controversial. Despite improvement of lipid profile due to treatment of subclinical hypothyroidism, there is no clear evidence that this beneficial effect can be associated with decreased cardiovascular or all-cause mortality in elderly patients.

Furthermore, Parle et al.[48] have reported that L-thyroxine replacement therapy does not improve cognitive function in elderly individuals with subclinical hypothyroidism.

When the natural history of subclinical hypothyroidism was evaluated in the elderly, the final results depended on the presence or absence of thyroid antibodies and on that to what extent TSH concentration was increased. Thus, a quite high rate of reversion of subclinical hypothyroidism to euthyroid status in adults aged at least 65 years with lower baseline TSH levels and antithyroid peroxidase antibody (TPOAb) negativity was observed.[49]

In turn, higher TSH level and TPOAb positivity were independently associated with lower chance of reversion to euthyroidism. Moreover, TSH levels ≥ 10 mIU/l were independently associated with progression to overt hypothyroidism.[49]

Similar findings, showing that higher baseline TSH levels are associated with progression from subclinical to overt hypothyroidism and that higher TSH level (> 8 mIU/l) is a predictive value for development of overt hypothyroidism, were recently reported by Imaizumi et al.[50]

On the other hand, there is strong evidence that thyroid hypofunction may contribute to increased lifespan (see further in the text). Therefore, taking into account all mentioned observations, the replacement therapy with L-thyroxine is not uniformly recommended in elderly people with subclinical hypothyroidism.[31]

In turn, subclinical hyperthyroidism, characterized by serum TSH levels below lower limit of the reference range and normal serum FT_4 levels, is observed in about 8% of individuals aged 65 years and older.[51]

Subclinical hyperthyroidism may be associated in older adults with decreased bone mineral density and fractures, or cognitive impairment.[31,51]

Furthermore, subclinical hyperthyroidism is associated with increased risk of total, as well as CHD mortality and atrial fibrillation (AF) incidents. The highest risks of CHD mortality and AF are observed in the case of TSH levels lower than 0.1 mIU/l.[52]

Unexpectedly, de Jongh et al.[45] have reported that subclinical hyperthyroidism is not associated with impairment of physical and cognitive function or depression in elderly people, aged 65 years and older. These authors have also demonstrated that subclinical hyperthyroidism is not associated with the increased overall mortality risk.

Such results are quite difficult to explain. Presumably, that ambiguity in observations may result from differences in the number of individuals enrolled in particular studies or from follow-up duration.[31]

Interestingly, Rosario[53] has recently shown that progression of subclinical hyperthyroidism to overt hyperthyroidism in elderly patients is an uncommon observation.

Nevertheless, since subclinical hyperthyroidism (and obviously, overt hyperthyroidism with increased T_4 level) may lead to increased risk of total, as well as CHD mortality, patients older than 65 years, with low TSH levels – particularly in case of toxic multinodular goitre or a solitary autonomous thyroid nodule – require proper medical treatment.[31]

It should also be stressed that during aging, gender-specific alterations in TSH and free thyroid hormone levels were observed.[54] Namely, with increasing age in males there were decreases in free thyroid hormones but not in TSH

concentrations. In turn, in females, the free thyroid hormone levels were not changed with aging but TSH level increased in age-dependent manner.[54]

It is also indicated that even in euthyroid older men with normal levels of TSH, differences in FT_4 levels within the normal range predict specific health outcomes relevant to aging. For example, higher FT_4 within the normal range was independently associated with frailty in euthyroid men aged ≥70 years.[31]

Moreover, higher FT_4 levels within the normal range were associated with lower hip bone mineral density, increasing bone loss and fracture risk in postmenopausal women.[55]

Therefore, it seems that further studies are required to explain whether higher FT_4 levels contribute causally (or not) to the above mentioned poorer health outcomes. Moreover, it is of interest to clarify whether FT_4 levels in the low-normal range could be considered as potential biomarkers for healthy aging.[31]

Although it is demonstrate that the increased TSH level resulting from subclinical hypothyroidism further rises with aging, other findings suggest that aging is associated – in the absence of any thyroid disease – with lower TSH levels.[31]

It has been known that TSH secretion in response to thyrotropin-releasing hormone (TRH) is reduced in aging individuals, and serum TSH level is usually lower in older than in young people in response to decreased thyroid hormone concentrations, suggesting a certain level of insensitivity of thyrotrophic cells in anterior pituitary, occurring with age; moreover, nocturnal surge of TSH is – to various degree – lost in the elderly.[31]

On the other hand, Bremner et al.[56] have recently reported that the TSH increase – observed by other authors during aging – seems to be a consequence of age-related alteration in the TSH set point or reduced TSH bioactivity. Interestingly, the largest TSH increase is observed in people with the lowest TSH at baseline, and, in turn, people with higher baseline TSH levels had proportionally smaller increases in TSH concentrations.

It is worth adding that TRH and FT_4 serum levels do not differ between young, middle-aged and elderly subjects.[57]

Thyroid cancerogenesis and aging processes

The prevalence of thyroid nodules and thyroid neoplasms is increased in the elderly. Among elderly people, males are at higher risk of cancer and thyroid cancer is more aggressive in men than in women.[58]

Papillary thyroid carcinoma (PTC) is the most common endocrine malignant neoplasm in the older individuals. Women are affected by PTC two to three times more often than men. Nevertheless, female-to-male ratio seems to decline with the process of aging. Importantly, the mortality rate of PTC is usually higher in the elderly. Presumably, it is a consequence of increased mitotic activity of these tumors and increased likelihood of distant metastases. It is known that in general population patients with aggressive variants of PTC have higher risk for the metastatic disease development. The potential role of NDRG2 gene expression in the development and progression of PTC is also raised. It is worth recalling that mutated BRAF gene is an independent predicting factor of poor outcome in PTC and is related to advanced age.[31]

Follicular thyroid carcinoma (FTC) occurs also often in older people and is the second most common and the second least aggressive thyroid cancer. This cancer is more likely to metastasize hematogenously to distant sites, resulting in a worse prognosis in comparison with PTC.[58] Medullary thyroid carcinoma (MTC), which derives from the parafollicular cells (C cells) of the thyroid gland, constitutes up to 5% of all thyroid malignancies. Its sporadic form, more frequent than is familial MTC, occurs more commonly in the older population.[31]

Rapidly growing and typically very aggressive anaplastic (undifferentiated) thyroid carcinoma (ATC) is rare. However, one should strongly emphasize that its prevalence is considerably higher in older than in younger people. By the time of diagnosis, most patients have widespread local invasion and distant metastases. Age appears to be a strong predictor of poor prognosis in ATC.[58]

THYROID DISEASES IN THE ELDERLY

Thyroid diseases regardless of age can be classified as functional disorders (hypothyroidism and hyperthyroidism), inflammatory conditions (thyroiditis) and neoplastic conditions (nodules and carcinomas). Prevalence of neoplastic disorders, hypothyroidism and thyroid autoimmunity increases with age. Overt hypothyroidism occurs in 2–5% of the patients older than 60 years.[7,28] Hyperthyroidism, on the other hand, is more common in the younger population. The prevalence in the elderly is approximately 0.5–3%,[28] but 10–15% of the patients with hyperthyroidism are older than 60 years.[59] In the elderly, the diagnosis of thyroid dysfunction is more often overlooked or misdiagnosed, as the symptoms are often subtle or absent[60] and are

easily confused with coexisting illnesses or mistaken as age-related changes. High index of suspicion of thyroid dysfunction in the elderly is needed.[28]

HYPERTHYROIDISM

Epidemiology

The prevalence of hyperthyroidism in older adults is estimated to be 0.5–4%.[32,61] Even though Graves' disease still remains the most common etiology, the prevalence of multinodular goiter and toxic nodular adenomas tends to increase with age.[32]

Clinical Presentation

Two-thirds of older adults with hyperthyroidism will present similarly to younger patients. Symptoms will be consistent with sympathetic overactivity and include tremors, anxiety, palpitations, weight loss and heat intolerance. However, one-third of older adults will present with apathetic hyperthyroidism.[62]

The paucity of clinical signs of hyperthyroidism in older adults (age≥70) has been confirmed by several studies,[60,63] with weight loss, apathy and tachycardia the most commonly occurring symptoms ($p<0.001$).[32]

A large cross-sectional study by Boelaert K et al.[64] (n=3049) showed an increased prevalence of weight loss in older patients (over the age of 61) and identified shortness of breath as a symptom commonly reported in older adults ($p<0.001$). This study also demonstrated a higher proportion of older adults reporting only one or two symptoms, versus five or more in the younger patients.

The absence of classical symptoms and signs in older adults presents a diagnostic challenge and may lead to delay in treatment and worse outcome.[63,64]

More common than overt hyperthyroidism in older adults is subclinical hyperthyroidism which is estimated to have a prevalence of 3–8% and is more common in women than men, especially in patients over the age of 70.[32]

In a study of the natural history of subclinical hyperthyroidism in female patients ≥60 years of age (n=102), Rosario PW[65] showed that progression to overt hyperthyroidism is infrequent at 1% per year.[65]

Laboratory tests to assess for hyperthyroidism in the elderly

A suppressed serum TSH concentration is the main diagnostic laboratory test. Serum Total triiodothyronine (TT3), FT3, Total thyroxine (TT4), and FT4 concentrations are increased in overt hyperthyroidism and normal in subclinical hyperthyroidism. In toxic multinodular goiter, TT3 and FT3 may be increased with normal or high normal values for TT4 and FT4, consistent with the diagnosis of "T3 toxicosis". TSH receptor-antibodies are usually positive in patients with Graves' disease.[66]

Risks/Complications/Sequelae

Atrial fibrillation

It has been clearly demonstrated that age is independently associated with an increased risk of developing atrial fibrillation. Atrial fibrillation is estimated to be present in up to 20–35% of older patients suffering from hyperthyroidism and is especially common in those with hyperthyroidism secondary to toxic nodule(s).[32]

Long-standing low serum TSH concentration in older patients is associated with a 3-fold increased risk of developing atrial fibrillation.[10,32]

Because of greater incidence of underlying cardiac disease, the risk of developing atrial fibrillation is increased in patients over the age of 60. Atrial fibrillation in older adults may sometimes be the only clinical sign of hyperthyroidism. However, the degeneration of the sinus node and fibrotic changes in the cardiac conduction system make the presence of palpitations less likely. In addition, frequent use of beta-blockers or amiodarone in these patients can mask the arrhythmia. In contrast, younger hyperthyroid patients often present with sinus tachycardia.[32,64]

Cardiovascular mortality

Overt hyperthyroidism, and less often subclinical hyperthyroidism, can be accompanied by several cardiovascular changes including widened pulse pressure, exercise intolerance, increased risk for atrial fibrillation and increased cardiac mass.[32,67]

Several cross-sectional and case-control studies have found that decreased levels of serum TSH are associated with increased cardiovascular mortality in older adults.[32,68]

In addition, subclinical hyperthyroidism has been shown to be associated with left ventricular hypertrophy, which is a predictor of cardiovascular mortality.[32,67]

Osteoporosis

Overt hyperthyroidism is a well-recognized risk factor leading to low bone mineral density and osteoporotic fractures, especially in older women.[69] Thyroid hormone acts on osteoblasts and osteoclasts to increase bone turnover, leading to net bone loss.[32]

Notably, most studies investigating the relationship between thyroid dysfunction and fracture risk have been specific to women. Bauer DC et al,[70] in a large prospective fracture study (n=686), reported that women over the age of 65 with TSH level ≤0.1 mIU/L had a threefold increased risk for hip fracture and a fourfold increased risk for vertebral fracture as compared to euthyroid counterparts.

In a study of subclinical hyperthyroidism in older adults (mean age=72.8 years) with sex-specific analysis, men were found to have increased incidence of hip fractures compared to women (13.8% vs. 12%; $p<0.01$).[71]

Ophthalmopathy

Contradicting studies exist regarding the association of symptoms and signs of ophthalmopathy in Graves' disease with increasing age. Most studies published on this subject demonstrated a positive correlation between prevalence and severity of ophthalmopathy with increasing age.[32,60]

However, one prospective cohort study found ophthalmopathy to be frequent in younger patients with Graves' as compared to older adults (46% vs. 6%; $p<0.001$).[64]

HYPOTHYROIDISM

Epidemiology

Estimates of the prevalence and incidence of hypothyroidism among older adults are variable depending on populations studied and criteria used to define the condition.[32]

A large screening study (n=25,000) revealed that 10% of men and 16% of women aged 65–74 had TSH levels above the upper limit of the reference range.[72]

The most recent National Health and Nutrition Examination Survey (NHANES) reported that a significantly greater number of women aged 50–69 met criteria for subclinical and clinical hypothyroidism compared to men in the same age range.[35]

Moreover, a study evaluating geriatric patients under medical care demonstrated that 15% of the women and 17% of the men had previously undiagnosed hypothyroidism.[73]

The incidence of hypothyroidism steadily increases with advancing age, predominantly due to a rising incidence of autoimmune thyroiditis (Hashimoto's).[32]

In a survey by Reinhardt et al.,[74] the reported incidence of Hashimoto's thyroiditis was 67% in a patient population with a mean age of 73 years (n=24).

A survey of endocrinology clinic patients revealed that 47% of patients aged 55 years and older presenting with primary hypothyroidism carried a diagnosis of

autoimmune thyroiditis, while 27% had postsurgical hypothyroidism and 10% had post-radioiodine hypothyroidism.[75]

Clinical Presentation

A high index of suspicion is required for diagnosis of hypothyroidism in older adults because symptoms and signs such as fatigue, weakness, constipation, dry skin and cold intolerance may be attributed to other diseases common in older patients, medication side effects or aging itself. Psychiatric symptoms, such as depression, are also common in older adults with hypothyroidism.[32]

A prospective study by Doucet J et al.,[76] compared 24 clinical symptoms and signs of hypothyroidism between older (n=67; mean age=79.3 years) and younger patients (n=54; mean age=40.8 years). It was concluded that the mean number of clinical signs in older adults was 6.6 versus 9.3 in the younger population. Fatigue and weakness were the most common symptoms in older adults, while cold intolerance, paresthesia, weight gain and abdominal cramps were less common.

Laboratory tests to assess for hypothyroidism in the elderly

Since the most frequent cause of thyroid failure in the elderly is primary hypothyroidism, the most important diagnostic test is the measurement of circulating concentrations of TSH. If further evaluation is indicated, serum free thyroxine (FT4) and free triiodothyronie (FT3) are decreased in overt hypothyroidism and normal in subclinical hypothyroidism, although serum TSH and FT4 levels alone are usually sufficient to make the diagnosis of either overt or subclinical hypothyroidism. Anti-thyroperoxidase (TPO) antibodies are helpful in the diagnosis of autoimmune thyroiditis, the major cause of hypothyroidism in the elderly, especially women,

although serum concentrations of these antibodies may also be elevated in euthyroid individuals. Hypercholesterolemia may also be seen in untreated hypothyroidism.[66]

Risks/Complications/Sequelae

Cognitive impairment

Hypothyroidism in older adults has been associated with impairment of several cognitive domains including memory, attention and concentration, language, executive function and perceptual and visuospatial function. Severe hypothyroidism may mimic depression and dementia. Neuropsychiatric symptoms usually improve with treatment and restoration of a euthyroid state.[32]

The relationship between subclinical hypothyroidism and cognition is less clear. It is postulated that older adults may be more vulnerable to the effects of subclinical hypothyroidism given age-related changes to the hypothalamic-pituitary-thyroid axis. However, several studies in older adults did not show a significant association between mildly elevated TSH and reduced cognitive performance.[32]

Cardiovascular effects

The cardiovascular consequences of hypothyroidism in older adults are thought to be due to a reduction in both stroke volume and heart rate. Other contributing factors include increased risk of atherosclerosis, increased arterial stiffness, endothelial dysfunction and altered coagulation parameters. All of these abnormalities regress with levothyroxine replacement.[32]

Myxedema Coma

Myxedema coma occurs almost exclusively in older adults with longstanding primary hypothyroidism. It is usually precipitated by a concomitant medical illness. Patients may present with a rapid development of stupor, seizures, or coma along with respiratory depression. Hallmark signs of myxedema coma include localized neurological signs, hypothermia, bradycardia, hyponatremia and hypoglycemia. Myxedema coma is a severe and life-threatening clinical state in older adults with a mortality rate as high as 40%.[32]

THYROID NODULES

Epidemiology

It is known that the prevalence of thyroid nodules increases with age. By age of 65 years, nearly 50% of individuals in iodine-sufficient areas have thyroid nodules when evaluated with ultrasound.[32]

A survey by Cavaliere R et al.[77] showed that the prevalence of multinodular goiter in older adults in an iodine-deficient area was 74% in patients aged 55–75 years and 54% in patients aged 76–84 years.[77] Thyroid nodules may be benign adenomas, cysts, cancer or inflammation.[32]

As per American Thyroid Association (ATA) guidelines,[78] initial evaluation constitutes measurement of serum TSH. If the TSH is subnormal, the next step consists of a radionuclide thyroid scan using either technetium pertechnate or ^{123}I. A diagnostic thyroid ultrasound should be performed in all patients with known or suspected thyroid nodules when TSH is found to be normal or high.

Ultrasonographic features associated with a higher likelihood of malignancy include hypoechogenicity, increased intranodular vascularity, presence of microcalcifications, absence of a halo, irregular borders, a nodule with a height greater than width and presence of suspicious cervical lymphadenopathy. Ultrasound-guided fine needle aspiration (FNA) is the subsequent specific diagnostic test, but it is not generally recommended for subcentimeter nodules.[32]

THYROID CANCER

Epidemiology

The prevalence of clinically apparent thyroid cancer in adults aged 50–70 years old is estimated to be 0.1%.[79] As patients age, there is a greater incidence in poorly-differentiated thyroid cancer types. However, well-differentiated papillary thyroid cancer is still the most common thyroid cancer in older adults and it presents similar to younger patients.[32]

Clinical Presentation

These are slow-growing tumors and the majority of patients are asymptomatic or may present with a painless neck mass. More advanced disease may present with palpable cervical lymphadenopathy, hoarseness, dysphagia and respiratory distress secondary to local invasion and compression. In a retrospective study of data from the National Cancer Institute's The Surveillance, Epidemiology, and End Results (SEER) Program, it was demonstrated that the incidence of papillary thyroid cancer is increasing disproportionally in patients older than 45 years and the most commonly found tumor in this group is now a papillary thyroid microcarcinoma (<1 cm). It is speculated that these increased rates are due to

growing use of imaging studies and subsequent discovery of incidental thyroid nodules in older patients.[32]

Follicular thyroid cancer is more common in areas of iodine deficiency with the peak incidence in the sixth decade of life. It commonly presents with an asymptomatic neck mass, which may be incidentally discovered with imaging studies.[32]

In regards to medullary thyroid cancer, sporadic forms are more common in older patients as compared to familial forms. Many patients present with a palpable neck mass. There may be local or systemic symptoms secondary to metastases. Symptoms of hormone hypersecretion include diarrhea, flushing and bronchospasm.[32]

Anaplastic thyroid cancer is aggressive and has a peak incidence in the seventh decade of life. It often arises within a more differentiated thyroid cancer, and usually presents as a rapidly growing neck mass with metastases at time of diagnosis.[32]

In a recent retrospective study by Roche B. et al.,[80] 26 anaplastic thyroid cancers were identified out of 1500 thyroid cancers over a span of 16 years. The average anaplastic tumor size at diagnosis was 7.35 cm, with lymph node involvement in 61.5% and distant metastases in 34.5% of cases.

Risks/Complications/Sequelae

Thyroid cancer is the only cancer where age is included in the AJCC TNM staging system.[81-83] The mortality rates of patients with thyroid cancer increase

starting at age 45.[84] A steady decline in survival rates has been reported with increasing age, regardless of the degree of differentiation of the thyroid cancer.[32]

A large retrospective study (n=53,856) demonstrated lower 10-year survival rates in patients over the age of 45 with papillary (47–85% vs. 97%), follicular (57–66% vs. 98%), medullary (63–80% vs. 88%) and anaplastic (5-year survival rate: 13% vs. 55%) thyroid cancer.[85]

Extension of thyroid cancer outside the gland significantly worsened prognosis in older patients while it did not alter the favorable prognosis in younger patients.[32]

In a study of the SEER database,[86] the presence of lymph node metastases had no effect on survival in patients aged less than 45 years of age. However, in patients aged 45 years or older, there was an associated 46% increased risk of death if positive lymph nodes ($p<0.001$).

Distant metastases are also a worst prognostic sign in older patients with thyroid cancer. This may be related to thyroid cancer being less radioactive iodine-avid in older patients compared to younger patients. Thyroid cancer recurrence rates have also been shown to be influenced by age.[32]

Cady B et al.[87] demonstrated that women over the age of 50 had a 32% risk of thyroid cancer recurrence as compared to 10% in those younger than 50 years old.

Thyroid Function and Alzheimer's Disease

Given the potentially increased risk of cognitive decline with thyroid dysfunction and that progressive cognitive decline is the central clinical feature of

Alzheimer's disease, it is possible that thyroid status contributes, at least in part, to the clinical manifestation of Alzheimer's disease. Several clinical reports as well as laboratory and epidemiological studies support a link between thyroid hormones and Alzheimer's pathophysiology.[88]

Studies examining the relationship between TSH and Alzheimer's disease have yielded contradictory results. Low serum TSH concentrations as well as high thyroxine levels were proposed as risk factors for Alzheimer's disease in some studies but not in others.[88]

In a 6-year prospective follow-up study of mild cognitive impairment (which represents a transition between normal aging and Alzheimer's disease).[88]

Annerbo et al.[89] found a significant correlation between reduced TSH concentrations and patients converting from mild cognitive impairment to Alzheimer's disease.

However, no significant correlation was found between TSH or free T4 levels and global cognition in euthyroid patients with Alzheimer's disease.[90]

Key laboratory and imaging tests in elderly

Thyroid dysfunction is best evaluated by the measurement of circulating TSH concentrations. In general, normal thyroid function is characterized by normal circulating TSH concentrations unless specific causes of thyroid disorders are present. Recent data has suggested that the very elderly patients may have serum TSH concentrations slightly higher than the normal listed ranges in various

laboratories, and values up to 7 mIU/L in the absence of TPO antibodies may be the norm in these patients.[66]

Related to this concept are several studies that have demonstrated that TSH distribution and reference limits shift to higher concentrations with age and which vary by ethnicity (i.e., higher TSH concentrations have been reported in Caucasians as compared to either Blacks or American Hispanics, such as those from Puerto Rico or Dominican Republic). Slightly elevated TSH concentrations may be normal or even protective in elderly subjects, as has been reported in Ashkenazi Jewish centenarians whose heritable phenotype, characterized by a slightly higher serum TSH, is associated with longevity.[66]

Imaging may be helpful in the diagnosis. However, physical examination remains the first step in the diagnostic approach to elderly patients for suspected thyroid disorders. If a goiter is suspected, thyroid ultrasound is helpful in the evaluation of goiter size, the number of nodules, and suspicion for malignancy based on imaging characteristics. Thyroid ultrasound also evaluates thyroid blood flow to assess for thyroid hypervascularization and nodules in suspected Graves' disease and toxic multinodular goiter.[66]

In toxic multinodular goiter, a thyroid nuclear scan with either technetium or ^{123}I may be useful to characterize nodules as hot or cold. Fine needle aspiration biopsy to rule out malignancy should be carried out if cold nodules are demonstrated on a thyroid scan. The thyroid scan is also important in defining any hyperfunctioning nodules which might be ablated with radioactive iodine (^{131}I).[66]

Other tests that may prove helpful diagnostically

In patients with a goiter thought to extend into the mediastinum, chest X-ray or computed tomography (CT) may be useful in order to define the goiter and to identify compressive changes on the trachea. These data are particularly useful if thyroid surgery is considered.[66]

Unique Features of the Approach and Management of Thyroid Disorders in Older Adults[32]

Thyroid Disorder	Unique Features in Older Adults
Hyperthyroidism	
• Overt	• Less symptomatic with apathetic hyperthyroidism common. • Greater likelihood of developing atrial fibrillation or osteoporosis. • Antithyroid medications (propylthiouracil, methimazole): Increased risk of side effects, especially agranulocytosis. • Surgery: Increased risk of morbidity, but not contra-indicated. Primarily used if large, obstructive goiter or suspected malignancy.
• Subclinical	• Treat if age >65 with TSH persistently <0.1 mIU/L.
Hypothyroidism	
• Overt	• Myxedema coma almost exclusively occurs in older adults. • Age >50: Initiate lower dose of levothyroxine, usually 25 mcg orally daily and titrate to cardiovascular tolerance. • Target a wider TSH range since overtreatment may lead to significant morbidity.
• Subclinical	• Treat if TSH >10 mIU/L or clear symptoms/signs of thyroid failure.
Thyroid Nodules	• Prevalence increases with age.
Thyroid Cancer	• Greater risk of cancer recurrence and mortality with older age. • Age is involved in cancer staging. • Greater incidence of poorly differentiated thyroid cancer, including anaplastic, with increasing age. • Surgery: Higher surgical risk due to co-morbidities • Post-operative radioactive iodine ablation: Increased risk of empiric dosing exceeding maximum tolerated activity. Consider dosimetry in advanced disease. • Thyroxine suppression therapy for some well-differentiated cancers for a limited period: Lower doses required.

Overall, thyroid gland dysfunction is prevalent in older adults and may be associated with significant morbidity if misdiagnosed and untreated. Factors contributing to misinterpretation of thyroid function tests in older adults include age-

dependent physiological changes, co-morbidities and polypharmacy. Moreover, clinical signs and symptoms of thyroid dysfunction may be subtle or absent, making diagnosis more difficult. As thyroid disorders are often amenable to effective treatments that can improve quality of life, a high index of clinical suspicion is warranted.[32]

Studies on thyroid function tests in elderly population and clinical symptoms with abnormal thyroid function.

Earlier NystroÈm E et al.[91] reported a study in 1989 which stated that 25% of middle-aged and old women with subclinical hypothyroidism would benefit from thyroxin medication. The threshold for measuring TSH, at least in these females, should be low because the prevalence of thyroid dysfunction is high.

In the same year that is 1989 Blum CJ et al.[92] reported thyroid function tests of 179 euthyroid geriatric inpatients (83 ± 6 yr) unaffected by acute diseases or malnutrition were investigated and compared with those of 76 ambulatory healthy younger subjects (42 ± 13 yr). Elderly population was divided in three groups, respectively: group G I (n = 37, 65–78 yr), group G II (n = 64, 79–85 yr) and group G III (n = 78, over 85 yr). Severity-of-illness index of the patients was evaluated at entry in the study protocol. While total thyroxine (TT4), free triiodothyronine (FT3) and TSH levels remained unchanged, circulating total triiodothyronine (TT3)was significantly lower (113 ± 32 vs 150 ± 31 ng/dl, $p < 0.05$) and free thyroxine (FT4) was significantly higher (12.4 ± 2.7 vs 10.3 ± 2.3 pg/ml, $p < 0.05$) in aged people. Furthermore, TT3 decreased significantly from 130 ± 36 in G I to 110 ± 33 in G II and to 108 ± 25 in G III ($p < 0.01$), and FT4 increased progressively although not

significantly in the same groups. A close correlation was found between TT3 and severity index in male observations only ($r = -0.43$, $p < 0.01$), as well as between FT4 and severity index in both sexes ($r = 0.51$, $p < 0.001$ for men, $r = 0.21$, $p < 0.01$ for women). These data suggested that thyroid function tests have to be cautiously interpreted in a geriatric population, particularly in relation to the severity of the clinical state, and reference values should be determined for TT3 and FT4 in the ageing process.

A study by Kanaya et al.[93] was reported during 2002 to see association between thyroid dysfunction and total cholesterol level in an older biracial population over 2,799 well-functioning adults aged 70-79. This study showed that 9.7% of black women, 6% of white women, 3.2% of black men, and 2.2% of white men reported a history of hyperthyroidism. In the same study, 6.2% of black women, 16.5% of white women, 1.7% of black men, and 5.6% of white men reported a history of hypothyroidism.

A study was published by Abraham R. et al.[94] from Puducherry in 2009. This study showed that 19% of women over 60 years had elevated TSH above 4.5 µIU/ml and the percentage of women with elevated TSH was particularly high in the 60-80 years age group.

A study was reported by Madhuvan HS et al.[20] in 2013 to study the spectrum of thyroid dysfunction in elderly and to correlate clinical symptoms with abnormal thyroid function. A total of 100 subjects aged more than 60 years, who were suspected to be suffering from thyroid disorders or subjects with vague symptoms like generalized weakness, easy fatigability, lethargy, disinterest in daily activities,

to be suspicious of thyroid disorder, were subjected to detailed clinical examination & thyroid function testing by biochemical means. Those who were found to have altered thyroid functions, thyroid antibody (TPO) test were done. When thyroid nodule was present, further relevant investigations like Ultrasound (USG)/ Fine needle aspiration cytology (FNAC) neck was performed to make appropriate diagnosis. Thyroid disorders were present in 25%. Overt hypothyroidism in 11%, subclinical hypothyroidism in 9% cases, hyperthyroidism in 2% and subclinical hyperthyroidism in 3% patients was noted. In this study 38 patients were males and 62 were females. Females (18%) had high incidence of thyroid disorders than males (7%). As the age advanced the incidence of thyroid dysfunction increased which was statistically significant. Overt hypothyroidism was more common among elderly (11%). Classical clinical features of hypothyroidism and hyperthyroidism were present in 9 and 2 patients respectively. All patients with hypothyroidism had positive Thyroperoxidase antibody (TPO AB). Patients with thyroid dysfunction have higher values of triglycerides (TGs), total cholesterol (T. Chol) and Low density lipoprotein (LDL) which was found to be statistically significant (p value <0.05). Patients with subclinical hypothyroidism have increased levels of total cholesterol and LDL levels as compared to overt hypothyroidism, but it was not found to be statistically significant. Goitre was noted in 4 patients with thyroid dysfunction among whom 2 patients had malignancy; one was follicular variant of papillary carcinoma and the other a primary thyroid Lymphoma, which is a rare tumour of thyroid gland. Authors commented that, thyroid dysfunction in elderly is not uncommon. Thyroid abnormalities were more among females (18%) than in males (7%). Clinical diagnosis is difficult to make but thyroid function test (TFT) always helps in diagnosing the disease. Subclinical state is equally common as

clinical state in elderly population. As the age advances the incidence of thyroid disorders increases. Hypothyroidism was more common than Hyperthyroidism. Dyslipidaemia was noted more commonly in patients with thyroid abnormalities as compared to patients with normal TFT. A strong clinical suspicion of thyroid diseases should be considered in elderly patients who present with vague symptoms like generalised weakness, easy fatigability, lethargy and disinterest in daily activities. Elderly patients should be screened for thyroid dysfunction.

Pratap A. et al.[16] reported a study in 2014 to observe the thyroid parameter in geriatric age group to contribute to the ongoing debate whether the normal TSH level should be reconsidered in view of the large no of subclinical hypothyroidism cases in elderly. The Total T3 levels, is more in males as compared to females in both geriatric and young population, however the Total T4 and TSH levels were more in females as compared to males. The authors emphasized the fact that there should be a separate normal range for elderly population to correctly diagnose an elderly to be hypothyroid and treat accordingly.

Recently Lakshminarayana GR et al.[95] (2016) reported a study on thyroid dysfunction in elderly from kerala. This study showed that the prevalence rate of thyroid disorders was higher in famales (14.73%) than males (13.11%) and in those aged ≥ 70 years (14.74%) than subjects in the age group of 60 – 69 years (13.57%). Overt hypothyroidism was the commonest (5.81%) disorder followed by subclinical hypothyroidism in 5.54% subjects. Majority (90.69%) of cases overt hypothyroidism were of primary hypothyroidism. The hyperthyroidism was prevalent in 1.76% followed by subclinical hyperthyroidism in 0.88% of subjects. Overt hypothyroidism and hyperthyroidism were common in those aged ≥ 70 years and

subclinical hypothyroidism and subclinical hyperthyroidism were common in age group of 60 – 69 years.

Kumar H. et al.[9] reported a study in 2016 to study the presentation and clinical profile of thyroid disorder in elders in the North-West Rajasthan. This study was carried out on 553 elderly patients in the Department of Medicine, S P Medical College, Bikaner, North-Western Rajasthan. All patients above 60 years were included. Clinical examination was done for detection of thyroid disorders and, keep in mind, the sign and symptoms of hypothyroidism and hyperthyroidism. Recently, a new immunoassay methodology has been applied to the measurement of thyroid stimulating hormone (TSH)/T3/T4 level. There were 456 cases in the age group 60–71 years. 71–80 and >80 years patients were in numbers of 57 and 20, respectively. Prevalence of hyperthyroidism, euthyroidism, and hypothyroidism according to age was 5.9%, 80.9%, and 13.2%, respectively. When we compared TSH with age, no statistically difference was found ($\chi 2 = 9.366$, df = 4; P = 0.05). Of 456 cases, 27 (5.9%) were in decrease level, 359 (80.9%) were within normal range, and 60 (13.2%) cases were having increasing pattern of TSH. Around 8 (4.8%) females having decrease level, 135 (81.8%) were having within normal range of TSH, 22 (13.3%) females having increase level. Around 24 (6.5%) male having decrease level while 40 (10.9%) were having increase level of TSH. Weakness is the most common symptoms of thyroid dysfunction. A highly significant difference was found in weakness, feeling cold, constipation, palpitation, and diarrhea ($P < 0.001$) while significant difference was found in menstrual irregularity, hoarseness of voice, and irritability ($P < 0.01$). This study aimed at spectrum of various clinical aspects in the elderly population that differs from typical presentation concluded that, as the

age advances, the incidence of thyroid disorders increases with hypothyroidism being more common than hyperthyroidism. Authors recommended that more study required knowing clinical presentation of thyroid disorder in elderly populations.

IN 2017 Aurora RK et al.[2] reported a study to compare the incidence of thyroid levels in the elderly and the young. This study was conducted in the Department of Biochemistry, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India. The thyroid profile (free triiodothyroxine, free thyroxine and thyroid stimulating hormone) was analysed in 153 individuals not having any sign and symptoms or on any medication related to hypo or hyperthyroid. Thyroid profile was performed in the young and elderly male and female patients. Among 153 patients100 were female and 53 were male. The mean age of the male subjects was 45.05 ±5.5 years whereas the mean age of females was 42.31±5.2 years. There is slight decrease in FT4 and slight increase in FT3 and TSH in females as compare to males but the differences were not significant. Thyroid profile in both men and women show a definite increase in TSH level and decrease in FT3 and FT4 level in elderly individuals as compare to young ones. All three changes were significant. This study suggested that serum TSH levels increases with age, due to changes of normal aging.

More recently (2018) Robert L. et al.[96] reported a longitudinal study from 19 general practices in the United Kingdom (UK) to establish the stability of thyroid function over time, and identify predictors of development of overt thyroid dysfunction. A total of 2936 participants from the Birmingham Elderly Thyroid Study (BETS 1) with a baseline TFT result indicating euthyroid or subclinical state were re-tested after approximately 5 years. Change in thyroid-stimulating hormone (TSH), free thyroxine (FT_4), and thyroid status between baseline and follow-up was

determined. Predictors of progression to overt dysfunction were modelled. Participants contributed 12 919 person-years; 17 cases of overt thyroid dysfunction were identified, 13 having been classified at baseline as euthyroid and four as having subclinical thyroid dysfunction. Individuals with subclinical results at baseline were 10- and 16-fold more likely to develop overt hypothyroidism and hyperthyroidism, respectively, compared with euthyroid individuals. TSH and FT_4 demonstrated significant stability over time, with 61% of participants having a repeat TSH concentration within 0.5 mIU/L of their original result. Predictors of overt hypothyroidism included new treatment with amiodarone (odds ratio [OR] 92.1), a new diagnosis of atrial fibrillation (OR 7.4), or renal disease (OR 4.8). In this study, high stability of thyroid function was demonstrated over the 5-year interval period. The authors discouraged repeat testing, especially when a euthyroid result is in the recent clinical record. The authors also commented that, reduced repeat TFTs in older individuals is possible without conferring risk, and could result in significant cost savings.

METHODOLOGY

The present study was conducted in the Department of General Medicine, KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi from January 2017 to December 2017.

Study design

The study design was a one year hospital based cross sectional study.

Study period and duration

The present was done for a period of one year from January 2017 to December 2017.

Setting

The present study was carried out in the Department of General Medicine KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi a tertiary care teaching hospital attached to KLE University's Jawaharlal Nehru Medical College, Belagavi.

Source of Data

Elderly patients attending for regular checkups with clinical suspicion of thyroid disorders at outpatient department, Department of General Medicine and Geriatric Medicine, KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi were enrolled.

Sample size

A total of 100 elderly patients fulfilling the selection criteria were selected for the study.

Sampling procedure

The sample size was calculated based on the formula as mentioned below.

$n = 4 \times p \times q / d^2$

Where, p = Prevalence of the disease was considered as 25%

Based on a recent study by Madhuvan HS. et al.[20]

q = $100 - p$ =100-25 = 75

d = Absolute error taken as 10%

Therefore, $n = 4 \times 25 \times 75 / 10^2$

n = 75

Hence a minimum effect size required to calculate abnormal thyroid function tests in elderly population was 75. However during the study period 100 patients satisfied the selection criteria. Hence based on convenient sampling 100 elderly patients were studied.

Sampling method

Patients satisfying the selection criteria were enrolled based on convenient sampling.

Selection criteria

Inclusion Criteria

- Patients aged more than 60 years of either sex with clinical suspicion of thyroid disorders.

Exclusion Criteria

- Critically ill patients.
- Patients with established thyroid disorders
- Patients on thyroid supplements and drugs known to alter the thyroid functions.
- Patients who have undergone thyroid surgery, taken radioactive iodine therapy.
- Patients on iodine containing vitamins or minerals.
- Patients evaluated with radiological tests using contrast media in the recent past.

Ethical clearance

Prior to the commencement, the study was approved by the Institutional Ethics Committee of Jawaharlal Nehru Medical College, Belagavi.

Informed consent

Elderly patients attending for regular checkups with clinical suspicion of thyroid disorders at outpatient department, Department of General Medicine and Geriatric Medicine, at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi were evaluated for eligibility based on selection criteria. Those

who were eligible were briefed about the nature of the study and a written informed consent was obtained (Annexure–I) prior to the enrollment.

Data collection

Patients were interviewed and demographic data like gender and age were noted. Patients were also interviewed for the detailed history of associated medical conditions, surgical history if any, ongoing medical treatment if any, family history, diet pattern and personal history. A thorough general physical examination was conducted to assess vital parameters, anthropometry and clinical signs followed by systemic examination. All these findings were recorded on a predesigned and pretested proforma (Annexure-II).

Investigations

The selected patients were subjected for the evaluation of thyroid function tests.

Under aseptic conditions, 2 mL of venous blood was drawn and centrifuged and serum (500 micromL) collected from that and incubated with the reagent (separate for T3, T4 and TSH) for 1 hour at room temperature. Later the readings were taken from the instrument COBAS 6000. TPO antibody was estimated using chemiluminiscence method.

Study variables

Thyroid profile

The normal values for the T3, T4 and TSH were interpreted as below:[20]

- T3 – 0.4- 1.8 ng/mL
- T4 – 5- 10.7 mcg/dL
- TSH- 0.5- 8.9 mcIU/mL
- TPO antibody - upto 34 IU/mL.

Based on the thyroid profile, the patients were evaluated for thyroid abnormalities and diagnosed to have following conditions.

- Clinical hyperthyroidism
- Subclinical hyperthyroidism
- Clinical hypothyroidism
- Subclinical hypothyroidism

Statistical analysis

The data thus obtained was tabulated on Microsoft Excel spreadsheet. The categorical data was expressed as ratios and percentages. Chi-square test was used to find the association between thyroid abnormalities and clinical presentation. Continuous data was expressed as mean ± standard deviation (SD). At 95% confidence interval (CI), a probability value ('p' value) of less than or equal to 0.050 was considered to be statistically significant.

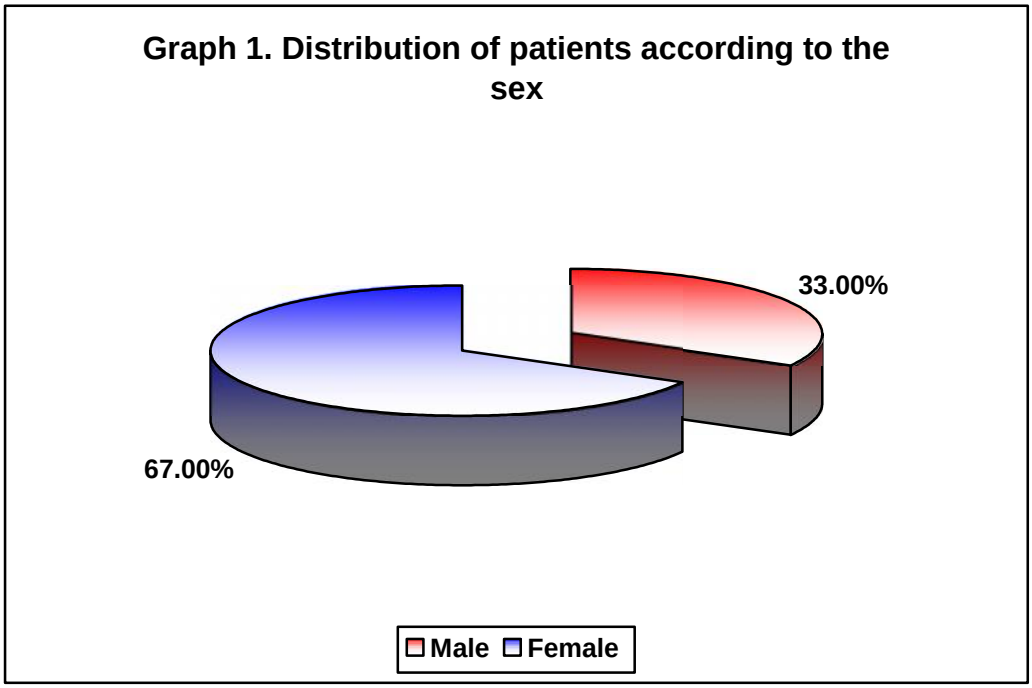
RESULTS

The present one year hospital based cross sectional study was done from January 2017 to December 2017. A total of 100 elderly patients attending for regular checkups with clinical suspicion of thyroid disorders at outpatient department, Department of General Medicine and Geriatric Medicine, KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi were studied.

The data was anlysed and the final results were tabulated and interpreted as below.

Table 1. Distribution of patients according to the sex

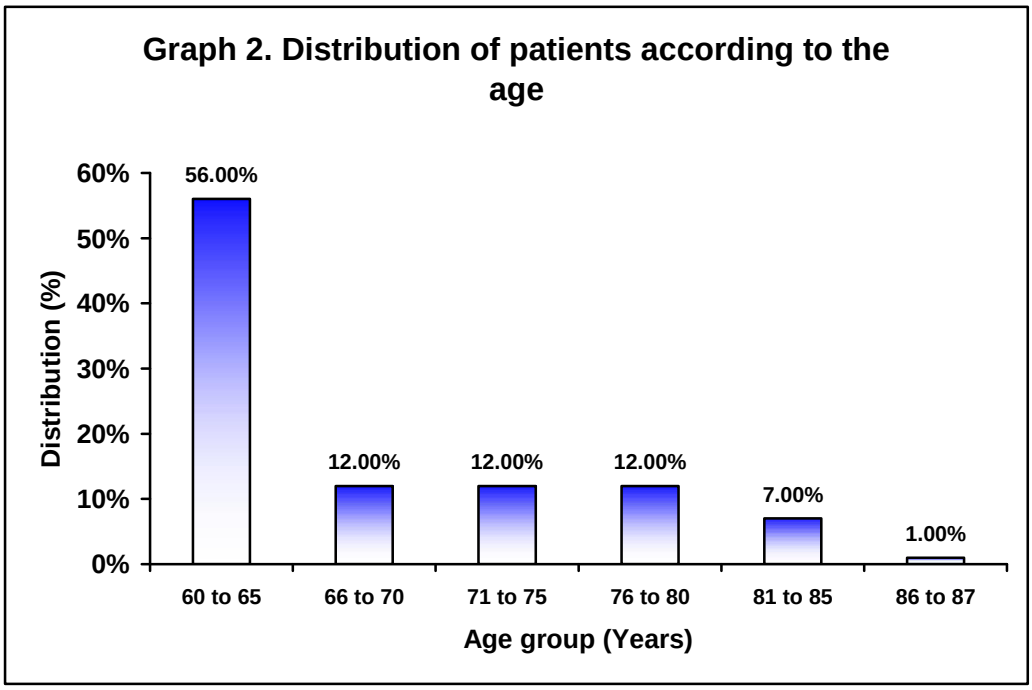
Sex	Distribution (n=100)	
	Number	**Percentage**
Male	33	33.00
Female	67	67.00
Total	**100**	**100.00**



In the present study majority of the patients were females (67%) and 33% of the patients were males. The male to female ratio was 1:2.03.

Table 2. Distribution of patients according to the age

Age group (Years)	Distribution (n=100)	
	Number	**Percentage**
60 to 65	56	56.00
66 to 70	12	12.00
71 to 75	12	12.00
76 to 80	12	12.00
81 to 85	7	7.00
86 to 87	1	1.00
Total	**100**	**100.00**

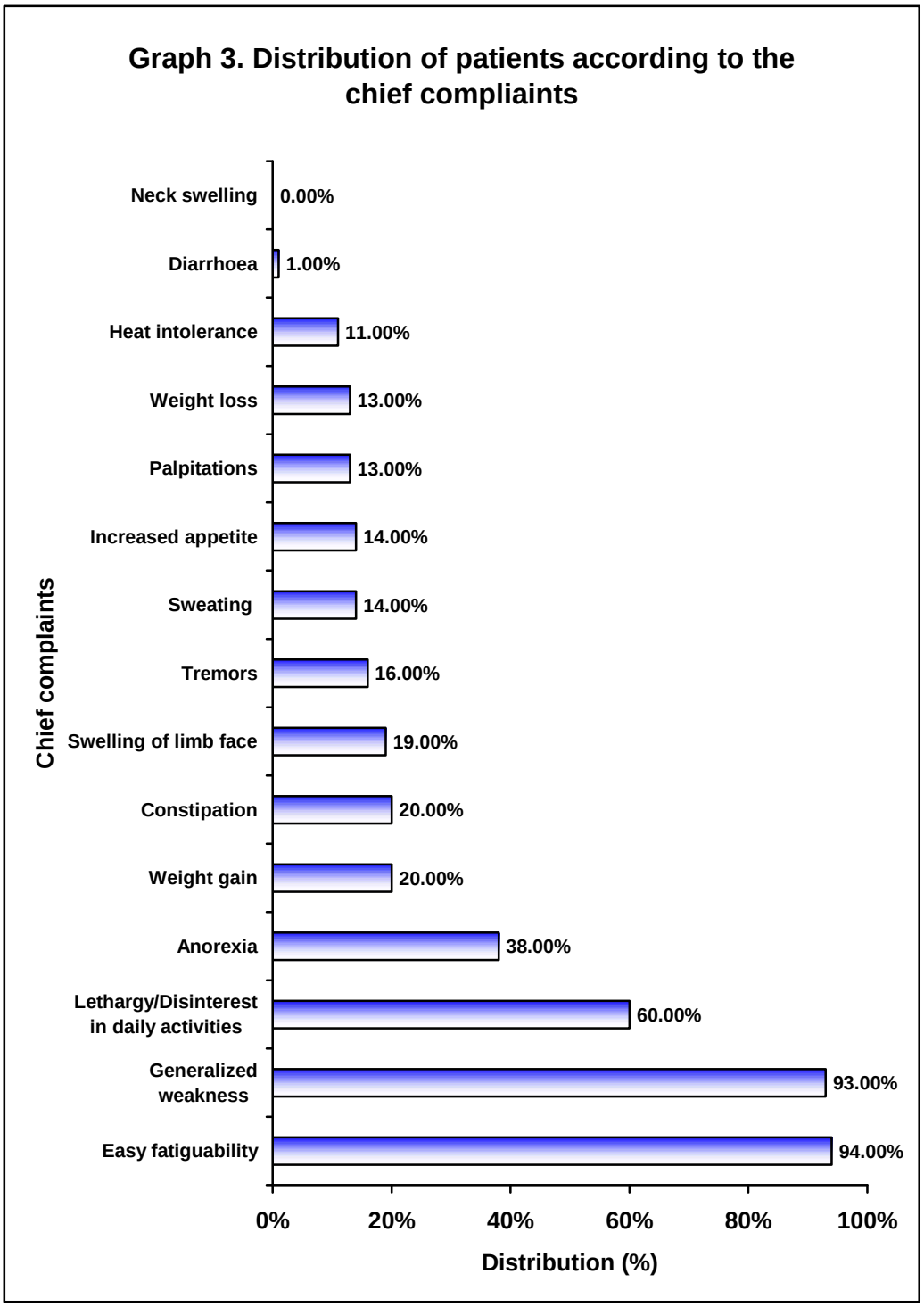


In this study most of the patients were aged between 60 to 65 years (56%). The mean age was 67.69±7.21 years and median age was 64 years and ranged between 60 to 87 years.

Table 3. Distribution of patients according to the chief complaints

Chief complaints	Distribution (n=100)	
	Number	**Percentage**
Easy fatiguability	94	94.00
Generalised weakness	93	93.00
Lethargy/Disinterest in daily activities	60	60.00
Anorexia	38	38.00
Weight gain	20	20.00
Constipation	20	20.00
Swelling of limb/face	19	19.00
Tremors	16	16.00
Sweating	14	14.00
Increased appetite	14	14.00
Palpitations	13	13.00
Weight loss	13	13.00
Heat intolerance	11	11.00
Diarrhoea	1	1.00
Neck swelling	0	0.00

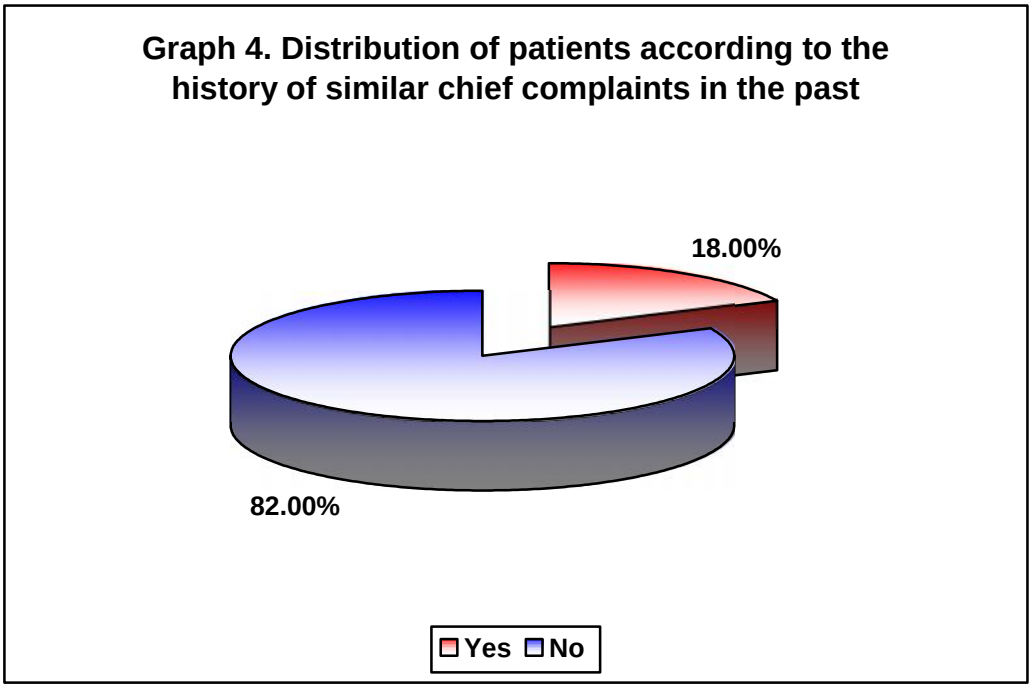
Multiple presentations hence total not shown



In the present study easy fatiguability (94%) and generalized weakness (93%) were the common clinical complaints. The other complaints reported are as shown in table 3 and graph 3.

Table 4. Distribution of patients according to the history of similar chief complaints in the past and treatment

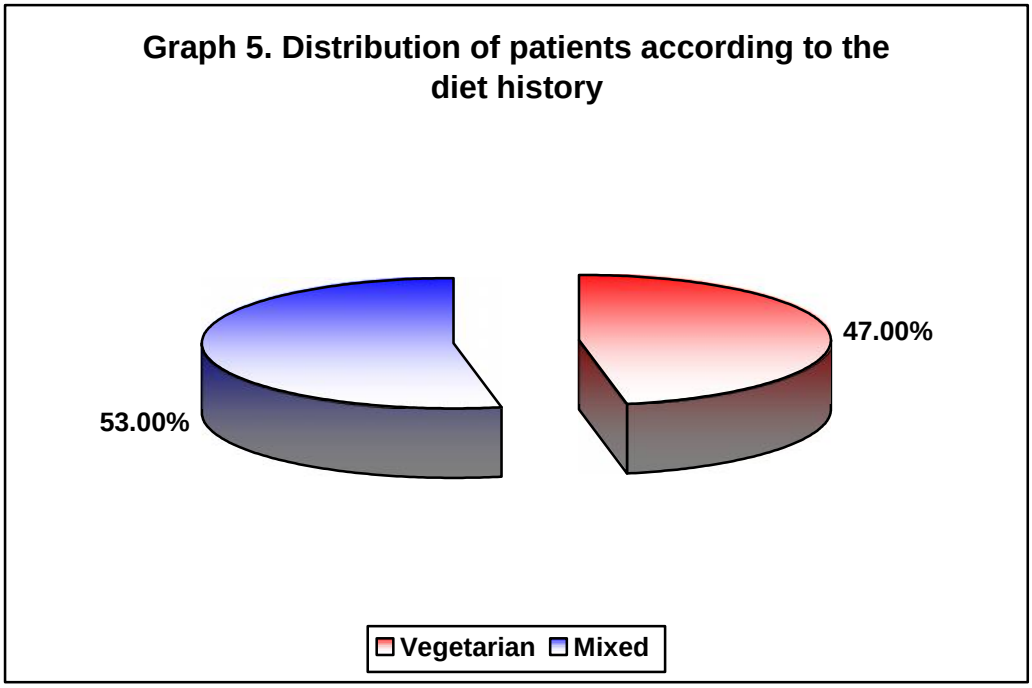
Variables	Findings	Distribution	
		No.	**%**
History of similar complaints in the past (n=100)	Yes	18	18.00
	No	82	82.00
	Total	**100**	**100.00**
Treatment history (n=18)	B plex	2	11.11
	Iron and multivitamin	5	27.78
	Iron supplementation	3	16.67
	Multivitamin	7	38.89
	Blood, multivitamin	1	5.56
	Total	**18**	**100.00**



In this study 18% of the patients reported history of clinical complaints suggestive thyroid abnormalities in the past and most of them had treatment with multivitamins (38.89%).

Table 5. Distribution of patients according to the diet history

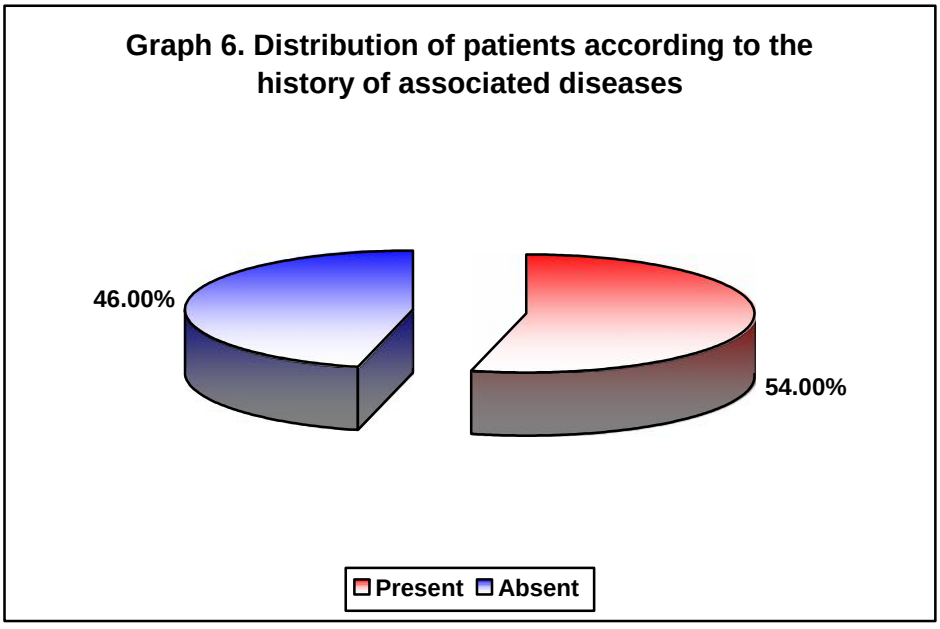
Diet pattern	Distribution (n=100)	
	Number	**Percentage**
Vegetarian	47	47.00
Mixed	53	53.00
Total	**100**	**100.00**



In the present study consumption of mixed diet was noted in 53% and vegetarian diet in 47% of the patients.

Table 6. Distribution of patients according to the history of associated diseases

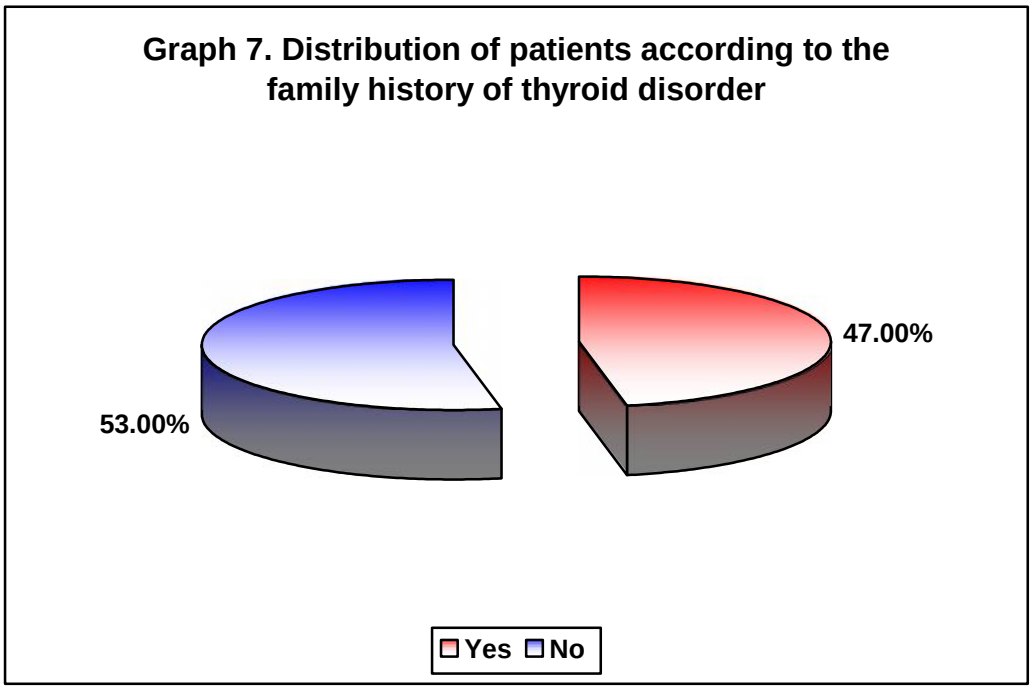
Variables	Findings	Distribution	
		No.	**%**
History (n=100)	Present	54	54.00
	Absent	46	46.00
	Total	**100**	**100.00**
Associated disease (n=54)	Hypertension	18	33.33
	Diabetes mellitus	12	22.22
	Ischaemic heart disease	10	18.52
	Diabetes mellitus with hypertension	5	9.26
	Asthma	3	5.56
	Bronchitis	1	1.85
	Haemorrhoids	1	1.85
	Ischaemic heart disease with hypertension	1	1.85
	Pulmonary tuberculosis	2	3.70
	Triple vessel disease	1	1.85
	Total	**54**	**100.00**



In this study history of other associated medical conditions was present in 54% of the patients and hypertension was the most common comorbid condition (33.33%) followed by diabetes mellitus (22.22%)

Table 7. Distribution of patients according to the family history of thyroid disorder

Family history	Distribution (n=100)	
	Number	**Percentage**
Yes	47	47.00
No	53	53.00
Total	**100**	**100.00**

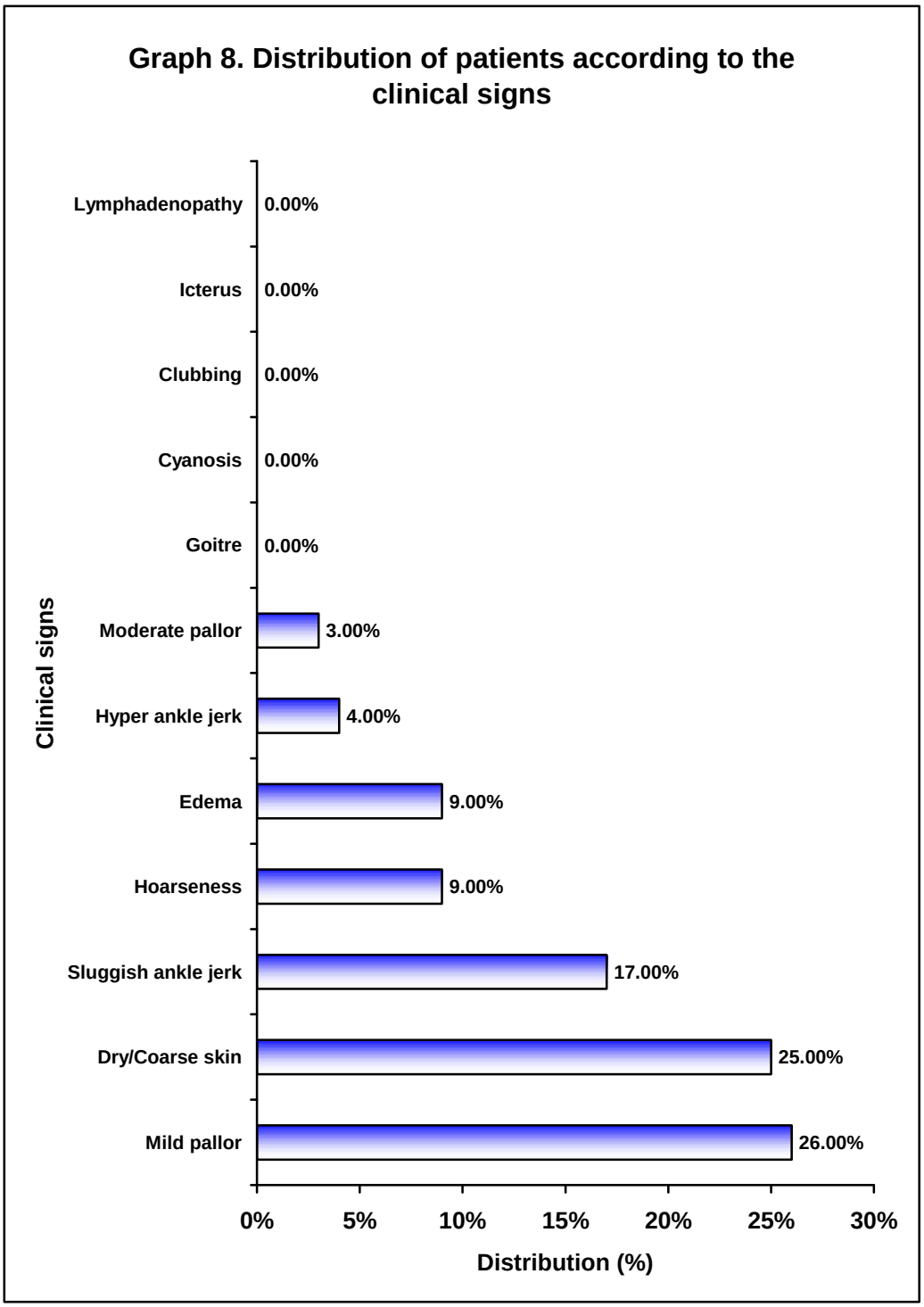


In the present study family history of thyroid disorders was reported by 47% of the patients.

Table 8. Distribution of patients according to the clinical signs

Clinical signs	Distribution (n=100)	
	Number	**Percentage**
Mild pallor	26	26.00
Dry/Coarse skin	25	25.00
Sluggish ankle jerk	17	17.00
Hoarseness	9	9.00
Edema	9	9.00
Hyper ankle jerk	4	4.00
Moderate pallor	3	3.00
Goitre	0	0.00
Cyanosis	0	0.00
Clubbing	0	0.00
Icterus	0	0.00
Lymphadenoapthy	0	0.00

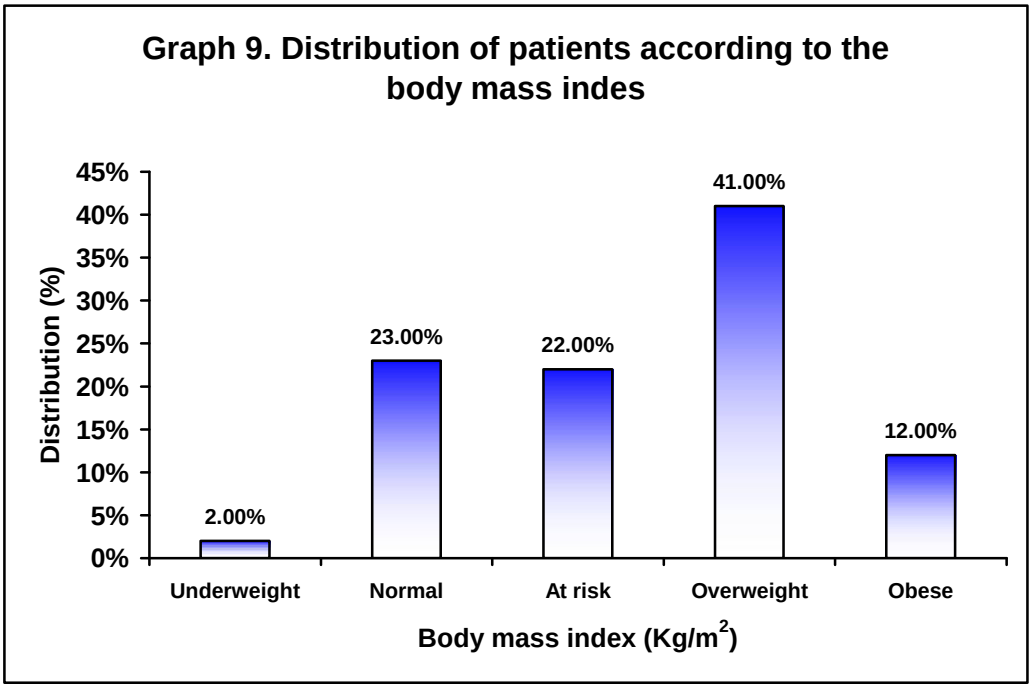
Multiple presentations hence total not shown



In this study mild pallor was the common clinical sign noted in 26% of the patients followed by dry/coarse skin in 25% of the patients. The other clinical signs noted are as depicted in table 8 and graph 8.

Table 9. Distribution of patients according to the body mass index

Body mass index (Kg/m^2)	Distribution (n=100)	
	Number	**Percentage**
Underweight (<18.5)	2	2.00
Normal (18.5 to 22.99)	23	23.00
At risk (23.00 to 24.99)	22	22.00
Overweight (25.00 to 29.99)	41	41.00
Obese (≥30)	12	12.00
Total	**100**	**100.00**

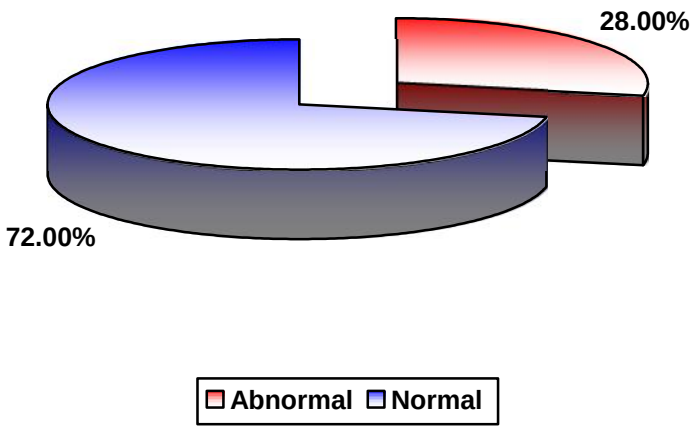


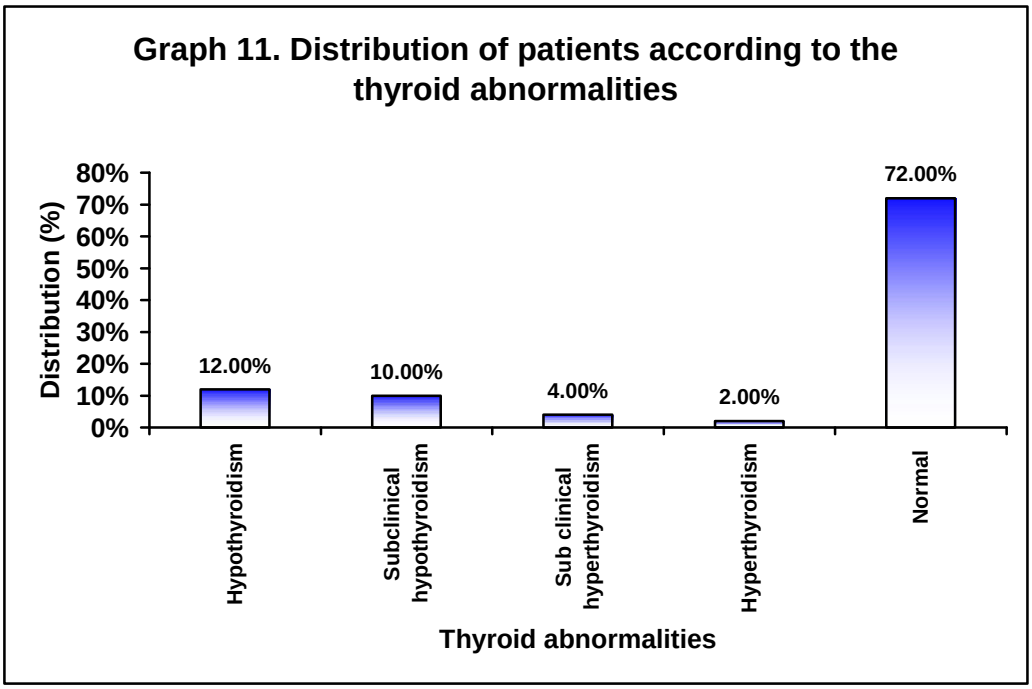
In the present study most of the patients had body mass index between 25 to 29.99 Kg/m^2. The mean body mass index was 25.38±3.60 Kg/m^2 and median body mass index was 25.10 Kg/m^2 with range 17.7 to 34.10 Kg/m^2

Table 10. Distribution of patients according to the thyroid profile and thyroid abnormalities

Variables	Findings	Distribution (n=100)	
		No.	**%**
Thyroid profile	Normal	72	72.00
	Abnormal	28	28.00
	Total	**100**	**100.00**
Thyroid abnormalities	Hypothyroidism	12	12.00
	Subclinical hypothyroidism	10	10.00
	Sub clinical hyperthyroidism	4	4.00
	Hyperthyroidism	2	2.00
	Normal	72	72.00
	Total	**100**	**100.00**

Graph 10. Distribution of patients according to the thyroid profile





In this study the thyroid abnormalities were diagnosed in 28% of the patients and hypothyroidism was the most common thyroid abnormality noted in 12% of the patients while subclinical hypothyroidism was diagnosed in 10% of the patients. However, 4% and 2% of the patients were diagnosed to have sub clinical hyperthyroidism and hyperthyroidism respectively.

Table 11. Clinical and thyroid profile of the study population

Variables	Mean (n=28)		Median	Range	
	Mean	SD		Minimum	Maximum
Age (Years)	67.79	7.21	64	60	87
Duration of similar complaints (Years)	3.17	1.47	3	1	5
Pulse rate (bpm)	76.61	14.25	80	48	110
Systolic blood pressure (mm Hg)	137.32	9.09	138	112	162
Diastolic blood pressure (mm Hg)	81.44	6.32	80	62	100
Respiratory rate (/Minute)	17.50	2.70	18	12	22
Temperature (^{0}F)	98.34	0.66	98	96	100
Body mass index (kg/m^2)	25.38	3.60	25.10	17.70	34.10
T3 (ng/mL)	1.32	0.88	1.20	0.23	6.20
T4 (µg/dL)	7.69	4.13	7.20	1.16	25.80
TSH (mcIU/mL)	12.31	22.82	4.10	0.01	88.20
TPO antibodies (IU/mL)	95.97	211.82	0.00	0.00	900.00

The clinical and thyroid profile of the patients is as shown in table 11.

Table 12. Sexwise comparison of mean thyroid profile

Variables	Males (n=33)		Females (n=67)		p value
	Mean	SD	Minimum	Maximum	
T3 (ng/mL)	1.45	1.00	1.25	0.80	0.307
T4 (µg/dL)	8.06	3.96	7.50	4.22	0.526
TSH (mcIU/mL)	7.77	12.75	14.54	26.20	0.164
TPO antibodies (IU/mL)	46.09	118.08	120.53	242.24	0.099

In this study the mean T3 (1.45±1.00 ng/mL vs 1.25±0.8 ng/mL; p=0.307), T4 (8.06±3.96 µg/mL vs 7.50±4.22 µg/mL; p=0.526), TSH (7.77±12.75 mcIU/mL vs 14.54±26.20 mcIU/mL; p=0.164) and TPO antibodies (46.09±118.08 IU/mL vs 120.53±242.24 IU/mL; p=0.099) were statistically comparable among males and females (p>0.050).

Table 13. Association of thyroid abnormalities with sex

Sex	Thyroid abnormalities				Total	
	Present		Absent			
	No.	%	No.	%	No.	%
Male	7	21.21	26	78.79	33	33.00
Female	21	31.34	46	68.66	67	67.00
Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**

p = 0.289

In the present study thyroid abnormalities were slightly high among females (31.34%) compared to males (21.21%) but the difference was statistically not significant (p=0.289).

Table 14. Association of thyroid abnormalities and age

Age group (Years)	Thyroid abnormalities				Total	
	Present		Absent			
	No.	%	No.	%	No.	%
60 to 65	17	0.00	39	30.36	56	56.00
66 to 70	2	0.00	10	16.67	12	12.00
71 to 75	4	0.00	8	33.33	12	12.00
76 to 80	3	0.00	9	25.00	12	12.00
81 to 85	2	0.00	5	28.57	7	7.00
86 to 87	0	0.00	1	0.00	1	1.00
Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**

p = 0.946

In this study maximum frequency of thyroid abnormalities was noted in patients aged between 71 to 75 years (33.33%). However no association was found between age and thyroid abnormalities (p=0.946).

Table 15. Association of thyroid abnormalities with clinical features

Clinical features	Findings	Thyroid abnormalities				Total		P value
		Present		Absent				
		No.	%	No.	%	No.	%	
Easy fatiguability	Present	23	24.47	71	75.53	94	94.00	**0.006**
	Absent	5	83.33	1	16.67	6	6.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Generalised weakness	Present	22	23.66	71	76.34	93	93.00	**0.002**
	Absent	6	85.71	1	14.29	7	7.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Lethargy/Disinterest in daily activities	Present	15	25.00	45	75.00	60	60.00	0.497
	Absent	13	32.50	27	67.50	40	40.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Anorexia	Present	12	31.58	26	68.42	38	38.00	0.647
	Absent	16	25.81	46	74.19	62	62.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Swelling of limb/face	Present	13	68.42	6	31.58	19	19.00	**<0.001**
	Absent	15	18.52	66	81.48	81	81.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Weight gain	Present	12	60.00	8	40.00	20	20.00	**0.001**
	Absent	16	20.00	64	80.00	80	80.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Constipation	Present	10	50.00	10	50.00	20	20.00	**0.024**
	Absent	18	22.50	62	77.50	80	80.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Heat intolerance	Present	2	18.18	9	81.82	11	11.00	0.355
	Absent	26	29.21	63	70.79	89	89.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Sweating	Present	3	21.43	11	78.57	14	14.00	0.407
	Absent	25	29.07	61	70.93	86	86.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Palpitations	Present	4	30.77	9	69.23	13	13.00	0.522
	Absent	24	27.59	63	72.41	87	87.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Weight loss	Present	2	15.38	11	84.62	13	13.00	0.231
	Absent	26	29.89	61	70.11	87	87.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Increased appetite	Present	4	28.57	10	71.43	14	14.00	0.593
	Absent	24	27.91	62	72.09	86	86.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Diarrhoea	Present	0	0.00	1	100.00	1	1.00	0.720
	Absent	28	28.28	71	71.72	99	99.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Tremors	Present	2	12.50	14	87.50	16	16.00	0.111
	Absent	26	30.95	58	69.05	84	84.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	

In the present study significantly higher number of patients who presented with easy fatiguability (24.47%; p=0.006), generalized weakness (23.66%; .p=0.002) swelling of limb/face (68.42%; p<0.001), weight gain (60%; p=0.001), constipation (50%; p=0.024) had thyroid abnormalities. While no association was found between lethargy/disinterest in daily activities (p=0.497), anorexia (p=0.647), Heat intolerance (p=0.355), sweating (p=0.407), palpitations (p=0.522), weight loss (p=0.231), increased appetite (p=0.593), diarrhoea (p=0.720) and tremors (p=0.111).

Table 16. Association of thyroid abnormalities with diet

Diet	Thyroid abnormalities				Total	
	Present		Absent			
	No.	%	No.	%	No.	%
Vegetarian	10	21.28	37	78.72	47	47.00
Mixed	18	33.96	35	66.04	53	53.00
Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**

p = 0.185

In the present study no association was found between diet and thyroid abnormalities (p=0.185)

Table 17. Association of thyroid abnormalities with family history of thyroid disorder

Family history	Thyroid abnormalities				Total	
	Present		Absent			
	No.	%	No.	%	No.	%
Present	21	44.68	26	55.32	47	47.00
Absent	7	13.21	46	86.79	53	53.00
Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**

p = 0.001

In this study significantly higher number of patients with family history of thyroid disorders were diagnosed to have thyroid abnormalities (44.68% vs 13.21%; p=0.001).

Table 18. Association of thyroid abnormalities with clinical signs

Clinical signs	Findings	Thyroid abnormalities				Total		P value
		Present		Absent				
		No.	%	No.	%	No.	%	
Pallor	Present	3	10.34	26	89.66	29	29.00	**0.012**
	Absent	25	35.21	46	64.79	71	71.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Dry/coarse skin	Present	14	56.00	11	44.00	25	75.00	**0.001**
	Absent	14	18.67	61	81.33	75	25.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Oedema	Present	6	66.67	3	33.33	9	9.00	**0.014**
	Absent	22	24.18	69	75.82	91	91.00	
	25	**28.00**	**75**	**72.00**	**100**	**100.00**	**25**	
Hoarseness	Present	7	77.78	2	22.22	9	9.00	**0.002**
	Absent	21	23.08	70	76.92	91	91.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	
Ankle jerk	Hyper	3	75.00	1	25.00	4	4.00	**0.020**
	Sluggish	17	100.00	0	0.00	17	17.00	
	Normal	8	10.13	71	89.87	79	79.00	
	Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**	

In this study thyroid abnormalities were associated with clinical signs of pallor (p=0.012), dry/coarse skin (p=0.001), hoarseness (p=0.002) and ankle jerk (p=0.020) and oedema (p=0.014).

Table 19. Association of thyroid abnormalities with body mass index

Body mass index (Kg/m^2)	Thyroid abnormalities				Total	
	Present		Absent			
	No.	%	No.	%	No.	%
Underweight (<18.5)	1	50.00	1	50.00	2	2.00
Normal (18.5 to 22.99)	5	21.74	18	78.26	23	23.00
At risk (23.00 to 24.99)	7	31.82	15	68.18	22	22.00
Overweight (25.00 TO 29.99)	12	29.27	29	70.73	41	41.00
Obese (30 ≥30)	3	25.00	9	75.00	12	12.00
Total	**28**	**28.00**	**72**	**72.00**	**100**	**100.00**

p = 0.838

In the present study no association was found between thyroid abnormalities and body mass index (p=0.838).

DISCUSSION

The thyroid function disorders are one of the commonest endocrine disorders in the world. The etiologic factors for thyroid disorders in elderly are multiple as in adults like autoimmunity, drugs, surgery, and radiotherapy. In addition to above factors; numerous changes occur in thyroid with age, contributing to raise in prevalence of thyroid disorders in elderly. The aging was shown to increase the process of autoimmunity; anti TPO titres more in females than males. Furthermore, the mode of clinical presentation varies widely in elderly, most are asymptomatic unlike young patients. and the diagnosis is more often overlooked or misdiagnosed, as the symptoms are often subtle or absent and are easily confused with coexisting illnesses.[95] Also, thyroid disorders in the elderly are associated with significant morbidity if they are not treated.[20]

However, there is limited data regarding the prevalence of thyroid disorders in elderly and its clinical implications from India.[95] Hence the present study was an attempt to assess the thyroid function in elderly population and to correlate clinical symptoms with abnormal thyroid function.

This one year hospital based cross sectional study was conducted from January 2017 to December 2017. A total of 100 elderly patients attending for regular checkups with clinical suspicion of thyroid disorders at outpatient department, Department of General Medicine and Geriatric Medicine, KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi were enrolled. The selected patients were investigated for thyroid profile that is T3, T and TSH alongwith TPO antibodies.

In the present study the T3 levels ranged between 0.23 to 6.20 ng/mL. The mean T3 levels were 1.32±0.88 ng/mL and median levels were noted as 1.20 ng/mL. Similarly the T4 levels ranged between 1.16 to 25.80 µg/mL. The mean T4 levels were 7.69±4.13 µg/mL and median levels were noted as 7.20 µg/mL. Likewise, the TSH levels ranged between 0.01 to 88.20 mcIU/mL. The mean TSH levels were 12.31±22.82 mcIU/mL and median levels were noted as 4.10 mcIU/mL. The TPO antibodies ranged between 0.00 to 900 IU/mL. The mean TPO antibodies were noted as 95.97±211.82 IU/mL and median levels were noted as 0.00 IU/mL. These findings suggest that, the mean TSH levels were profoundly high though, mean T3 and T4 levels were well within normal limits and TPO antibodies were profoundly high. Based on these findings, the thyroid abnormalities were diagnosed in 28% of the patients and hypothyroidism was the most common thyroid abnormality noted in 42.86% of the patients while subclinical hypothyroidism was diagnosed in 35.71% of the patients. However, 14.29% and 7.14% of the patients were diagnosed to have sub clinical hyperthyroidism and hyperthyroidism respectively.

The incidence of hypothyroidism steadily increases with advancing age, predominantly due to a rising incidence of autoimmune thyroiditis.[32] The frequency of thyroid abnormality noted in the present study (28%) was very high and it was in agreement with a recent study by Madhuvan HS et al.[20] who found that 25% patients have thyroid disorders. The frequency of thyroid abnormality noted in the present study was low compared to a study by Laxminarayan GR et al.[95] (2016) from Northern Kerala (13.99%), Cappola AR et al.[97] (2006) (18.33%) and Iglesias, P. et al.[98] (2009) (13.4%).

Author	Thyroid abnormalities (%)
Cappola AR et al.[97] (2006) (n=2639)	18.33%
Iglesias, P. et al.[98] (2009) (n=399)	13.4%
Laxminarayan GR et al.[95] (2016) (n=1479)	13.99%
Madhuvan HS et al.[20] (2013) (n=100)	25%
Present study (2018) (n=100)	28%

Thyroid abnormalities seen in different studies were variable (Table). Western studies[97,98] show a lower incidence compared to Indian series. Also a study from North Kerala[95] also showed lower incidence. The peak frequency of thyroid disorders observed in the present study compared to other studies[20,95,97,98] may be due to the selection bias and varied sample size of the study population in other studies. However, the present study followed pertinent selection criteria that is only selected cases with strong suspicion of thyroid abnormalities were included and critically ill patients, those with established thyroid disorders, on treatment with thyroid supplements and drugs, iodine containing vitamins or minerals which are known to alter the thyroid functions, history of thyroid surgery, radioactive iodine therapy and patients with history of radiological tests using contrast media were excluded. Hence the incidence of thyroid abnormalities may be high in the present study.

In the present study among the thyroid abnormalities, overt hypothyroidism was the common abnormality (12%) in the study area among elderly patients which was in agreement to the recent study by Madhuvan HS et al.[20] who also noted overt

hypothyroidism as common thyroid abnormality in 1% of the patients. Another study by Laxminarayan GR et al.[95] also reported that, overt hypothyroidism as most common abnormality but with relatively lower frequency (5.81%). However, Iglesias, P. et al.[98] (2009) reported lower rate of hypothyroidism (3.1%) and higher rate of subclinical hypothyroidism (6%) which was the second most common abnormality in the present study with 10% of the patients.

In the present study females (67%) outnumbered males (33%) with male to female ratio of 1:2.03. These findings suggest that the females are at high risk of thyroid disorders and the frequency of thyroid abnormalities is double in females as compared to males. However, the mean T3 (1.45±1.00 ng/mL vs 1.25±0.8 ng/mL; p=0.307), T4 (8.06±3.96 µg/mL vs 7.50±4.22 µg/mL; p=0.526), TSH (7.77±12.75 mcIU/mL vs 14.54±26.20 mcIU/mL; p=0.164) and TPO antibodies (46.09±118.08 IU/mL vs 120.53±242.24 IU/mL; p=0.099) were statistically comparable among males and females (p>0.050). Further out of 28 patients with thyroid abnormalities, higher frequency of thyroid abnormalities was noted in females that 21 out of 28 (31.34%) compared to males that is 7 out of 28 (21.21%). Though these findings hypothesize fourfold occurrence of thyroid abnormalities among females but the difference observed was statistically not significant (p=0.289). Hence the thyroid abnormalities are common in elderly irrespective of gender. Madhuvan HS et al.[20] reported that, out of 100 elderly patients 38 were males and 62 females an observation which was consistent with the present study. Madhuvan HS et al.[20] also noted a higher prevalence of thyroid dysfunction in females. Similar observations were noted in a recent study by Laxminarayan GR et al.[95] which can be explained by the autoimmune nature of the disease.

In this study more than half of the study population (56%) was aged between 60 to 65 years. The mean age was 67.69±7.21 years and median age was 64 years and ranged between 60 to 87 years. These findings suggest that, the present study was comprised of patients who belonged to seventh decade in life. However, maximum frequency of thyroid abnormalities was noted in patients aged between 71 to 75 years (33.33%) followed by 60 to 65 years (30.36%). But again the association was not significant between age and thyroid abnormalities (p=0.946). These findings suggest that thyroid abnormalities are common in geriatric population irrespective of age range. Madhuvan HS et al.[20] noted that as the age advances the incidence of thyroid dysfunction increases (p value significant). Another study by Laxminarayana GR et al.[95] reported that, the prevalence rate of thyroid function abnormalities was more in subjects aged ≥ 70 years a findings consistent with the present study.

In the present study easy fatiguability (94%) and generalized weakness (93%) were the common clinical complaints followed by lethargy/disinterest in daily activities (60%), anorexia (38%), weight gain (20%), constipation (20%), swelling of limb/face (19%), tremors (16%), sweating, increased appetite (14% each), palpitations and weight loss (13% each). However, one patient presented with diarrhea (1%) while neck swelling was not seen in any of the patient. Further, the common clinical sign noted mild pallor (26%) followed by dry/coarse skin (25%) and sluggish ankle jerk (17%). While the other uncommon clinical signs noted were hoarseness and Edema (9% each), Hyper ankle jerk and Moderate pallor (3% each). However, none of the patient had signs of cyanosis, clubbing, icterus and lymphadenoapthy. Further, significantly higher number of patients who presented with clinical features of easy fatiguability (24.47%%; p=0.006), generalized

weakness (23.66%; .p=0.002) swelling of limb/face (68.42%; p<0.001), weight gain (60%; p=0.001), constipation (50%; p=0.024) were diagnosed to have thyroid abnormalities. Also, those with clinical signs of pallor (p=0.012), dry/coarse skin (p=0.001), hoarseness (p=0.002) and ankle jerk (p=0.020) were diagnosed to have thyroid abnormalities. However, no association was found between clinical features of lethargy/disinterest in daily activities (p=0.497), anorexia (p=0.647), heat intolerance (p=0.355), sweating (p=0.407), palpitations (p=0.522), weight loss (p=0.231), increased appetite (p=0.593), diarrhea (p=0.720) and tremors (p=0.111) and oedema (p=0.014).

As noted in the presents study, easy fatigability and generalised weakness were the most predominant features noted in a study by Madhuvan HS et al.[20] Madhuvan HS et al.[20] also reported that, hyperthyroidism presented with features of weakness, fatigability, heat intolerance, increased sweating, although diarrhea was not seen in any patients. Though, the strong association observed between the clinical features cited above with thyroid abnormalities was the strength of the present study but prompts cautious interpretation due to several limitations. First, the association observed could not compared with other studies due to lack of similar data in the literature and secondly the associations derived through relatively smaller number of patients with clinical presentation and hence may not be generalized to the entire population. Also The smaller subset of patients with individual thyroid abnormalities that is only 4% and 2% of the patients were diagnosed to have sub clinical hyperthyroidism and hyperthyroidism respectively which limited us to find association between clinical features and individual thyroid abnormalities.

Earlier, Bemben et al.[8] (1994) reported that there were no significant differences (P > 0.05) in the frequencies of any of the clinical sign and symptoms of hypothyroidism between euthyroidism and hypothyroid patients. They concluded that thyroid status could not be predicted from clinical sign and symptoms in the elderly community dwelling patients.

In the year 2004, Limpawattana et al.[99] did a study to compare the clinical features of hyperthyroidism in patients older and younger than 60 year old. The more significant clinical presentation in the elder group was atrial fibrillation (AF), weakness, and anorexia whereas exophthalmos, goiter, heat intolerance, and hyperhidrosis were not as frequent. Therefore, unexplained AF weakness and anorexia should not exclude hyperthyroidism even with a paucity of typical clinical feature.[R6]

However, Madhuvan HS et al. reported that, sluggish ankle jerks/hung up reflex are a good indicator of hypothyroidism, and these features were seen in 45% patients with hypothyroidism. However, the present study also showed significant association of thyroid abnormalities with ankle jerk (p=0.020) a finding consistent with the study by Madhuvan HS et al.[20] despite of methodological differences.

In the present study consumption of mixed diet was noted in 53% and vegetarian diet in 47% of the patients. But no association was found between diet and thyroid abnormalities (p=0.185). Hence it may be hypothesized that, thyroid abnormalities in elderly are independent of diet consumed.

In this study with regard to medical history, 18% of the patients reported history of clinical complaints suggestive thyroid abnormalities in the past and most

of them had undergone treatment for the same with multivitamins (38.89%). Furthermore, history of other associated medical conditions was present in 54% of the patients and hypertension was the most common comorbid condition (33.33%) followed by diabetes mellitus (22.22%). The family history of thyroid disorders was reported by 47% of the patients and significantly higher number of patients with family history of thyroid disorders were diagnosed to have thyroid abnormalities (44.68% vs 13.21%; p=0.001). These findings implicate that, the risk of thyroid abnormalities in significantly high in elderly patients who have family history of thyroid disorders. However, these findings could not be compared with other studies due lack of similar data in the literature.

In the present study most of the patients (41%) had body mass index between 25 to 29.99 Kg/m^2. The mean body mass index was 25.38±3.60 Kg/m^2 and median body mass index was 25.10 Kg/m^2 with range 17.7 to 34.10 Kg/m^2. These findings suggest that, most of the patients in the present study were overweight. However, no association was found between thyroid abnormalities and body mass index (p=0.838). These finding propose lack of association between thyroid abnormalities and obesity. In contrast to these observations a recent study by Kumar H. et al.[9] reported positive association between TSH and body mass index that is, 50% cases of high level of TSH patients had >30 BMI. Due to the methodological differences the findings of the present study could not be compared with the study by Kumar H. et al.

Overall in the nutshell, the present study showed that, there is higher incidence of thyroid abnormalities among elderly population in the study area with overt hypothyroidism being the common abnormality. Furthermore, thyroid

abnormalities are common among females and in those who present during seventh decade of life. Also, easy fatiguability, generalized weakness, swelling of limb/face, weight gain, constipation are the common clinical presentations associated with thyroid abnormalities and pallor, dry/coarse skin, hoarseness and ankle jerk are the common signs associated with thyroid abnormalities. Furthermore, family history of thyroid disorders is also strongly associated with thyroid abnormalities in elderly. However these finding require further validation due to the potential limitations of the study that is, relatively smaller sample size, single center study. Hence further studies multicentric studies involving large sample size, may provide the true epidemiology and clinical implication on thyroid profile in elderly patients.

CONCLUSION

Based on the findings of this study it may be concluded that, there is higher incidence of thyroid abnormalities among elderly population in the study area with overt hypothyroidism being the common abnormality. Also, though not significant, thyroid abnormalities are common among females and in those who present during seventh decade of life.

Easy fatiguability, generalized weakness, swelling of limb/face, weight gain, constipation are the common clinical presentations associated with thyroid abnormalities and pallor, dry/coarse skin, hoarseness and abnormal ankle jerk reflex are the common signs associated with thyroid abnormalities. Furthermore, family history of thyroid disorders is also strongly associated with thyroid abnormalities in elderly. However, abnormalities are independent of clinical signs and symptoms of lethargy/disinterest in daily activities, anorexia, heat intolerance, sweating, palpitations, weight loss, increased appetite, diarrhea and tremors and oedema are thyroid. Also diet and body mass index are not associated with thyroid abnormalities.

SUMMARY

There is limited data regarding the prevalence of thyroid disorders in elderly from India. This study was an attempt to assess the thyroid function tests in elderly population and to correlate them with clinical symptoms.

This one year hospital based cross sectional study was carried out at outpatient department, Department of General Medicine and Geriatric Medicine, KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi. A total of 100 elderly patients attending for regular checkups with clinical suspicion of thyroid disorders from January 2017 to December 2017 were studied. The selected patients were investigated for T3, T4, TSH and thyroid antibodies. The salient findings of the study are summarized as below.

- The mean T3 levels were 1.32±0.88 ng/mL, the mean T4 levels were 7.69±4.13 µg/mL and mean TSH levels were 12.31±22.82 mcIU/mL. The mean TPO antibodies were noted as 95.97±211.82 IU/mL.

- Thyroid abnormalities were diagnosed in 28% of the patients and hypothyroidism was the most common thyroid abnormality noted in 12% of the patients. The other thyroid abnormalities noted were subclinical hypothyroidism (10%) while sub clinical hyperthyroidism and hyperthyroidism were diagnosed in 4% and 2% of the patients respectively.

- Majority of the patients were females (67%) and 33% of the patients were males. The male to female ratio was 1:2.03. The mean T3 (1.45±1.00 ng/mL vs 1.25±0.8 ng/mL; p=0.307), T4 (8.06±3.96 µg/mL vs 7.50±4.22 µg/mL;

p=0.526), TSH (7.77±12.75 mcIU/mL vs 14.54±26.20 mcIU/mL; p=0.164) and TPO antibodies (46.09±118.08 IU/mL vs 120.53±242.24 IU/mL; p=0.099) were statistically comparable among males and females (p>0.050). Thyroid abnormalities were slightly high among females (31.34%) compared to males (21.21%) but the difference was statistically not significant (p=0.349).

- Most of the patients were aged between 60 to 65 years (56%). The mean age was 67.69±7.21 years. Maximum frequency of thyroid abnormalities was noted in patients aged between 71 to 75 years (33.33%). However no association was found between age and thyroid abnormalities (p=0.946).

- Easy fatiguability (94%) and generalized weakness (93%) were the common clinical complaints and mild pallor was the common clinical sign noted in 26% of the patients followed by dry/coarse skin in 25% of the patients. Significantly higher number of patients who presented with easy fatiguability (24.47%; p=0.006), generalized weakness (23.66%; .p=0.002) swelling of limb/face (68.42%; p<0.001), weight gain (60%; p=0.001), constipation (50%; p=0.024) had thyroid abnormalities. Also thyroid abnormalities were associated with clinical signs of pallor (p=0.012), dry/coarse skin (p=0.001), hoarseness (p=0.002), ankle jerk (p=0.020) and oedema (p=0.014).

- No association was found between lethargy/disinterest in daily activities (p=0.497), anorexia (p=0.647), Heat intolerance (p=0.355), sweating (p=0.407), palpitations (p=0.522), weight loss (p=0.231), increased appetite (p=0.593), diarrhea (p=0.720) and tremors (p=0.111).

- History of clinical complaints suggestive thyroid abnormalities in the past was reported by 18% of the patients and most of them had treatment with multivitamins (38.89%).

- Most of the patients had body mass index between 25 to 29.99 Kg/m^2. The mean body mass index was 25.38±3.60 Kg/m^2 and median body mass index was 25.10 Kg/m^2 with range 17.7 to 34.10 Kg/m^2. No association was found between thyroid abnormalities and body mass index (p=0.838).

- Consumption of mixed diet was noted in 53% and vegetarian diet in 47% of the patients. No association was found between diet and thyroid abnormalities (p=0.185)

- Family history of thyroid disorders was reported by 47% of the patients. Significantly higher number of patients with family history of thyroid disorders were diagnosed to have thyroid abnormalities (44.68% vs 13.21%; p=0.001).

Based on the observations mentioned above it may be concluded that, there is higher incidence of thyroid abnormalities among elderly population in the study area and overt hypothyroidism is the common thyroid abnormality. Also, though not significant, females and patients who present during seventh decade of life are at high risk of thyroid abnormalities. Furthermore, easy fatiguability, generalized weakness, swelling of limb/face, weight gain, constipation are the common clinical presentations associated with thyroid abnormalities while pallor, dry/coarse skin, hoarseness and ankle jerk are the common signs associated with thyroid

abnormalities. Also family history of thyroid disorders is also strongly associated with thyroid abnormalities in elderly.

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ANNEXURE I – CONSENT FORM

<u>Title Of Research Study</u>: A PROSPECTIVE STUDY OF THYROID FUNCTION TEST IN GERIATRIC POPULATION AND ITS CLINICAL CORRELATION.

Principal Investigator:-
Dr. * ****** *******
Post Graduate Student,
Department Of General Medicine,
JNMC, Belagavi.

Guide:
Dr. ** * ******
Associate Professor,
Department of General Medicine,
JNMC, Belagavi.

Introduction and Purpose

Thyroid gland dysfunction is common in the elderly and is associated with significant morbidity if left untreated. Thyroid gland undergoes slight "Physiological" changes with ageing, either as a result of its participation in the senescence process or as an effect of other system changes. The changes can lead to either clinical/sub clinical states of Hypo/Hyperthyroidism.

Procedure

If you agree to be part of the research study, you will be asked the relevant history and will be subjected to relevant clinical examination and investigations. You will also have to give blood samples for the necessary investigations.

Risk and Benefits

The only risk and possible discomfort you might get is while taking blood from your arm for the investigations. It may cause swelling, pain, redness (rarely happens) at the site from where the blood is drawn.

You may not be benefitted by these investigations but you will be part of this study which is going to be useful to others in the future.

Alternatives

Taking part in this study is voluntary. You may choose not to take part in this study.

If you decide to take part you can later change your mind and withdraw from the study. Your decision will not change the present or future health care or other services that you receive. The study doctor or sponsor may stop your participation in this study at any time. If you choose not to take part in the study, you will receive the standard treatment for patients with your condition.

Privacy and Confidentiality

All information collected about you during the course of this study will be kept confidential to the extent permitted by law. The code numbers will identify you in this research record. Information from this study may be published but your identity will be confidential in any publication.

Institution / Sponsor's policy

Does not apply to this research

Financial incentives for participation

You will not be paid / offered any gifts /incentives for participating in the study.

Authorization to publish the results

The results of the study would be forwarded to the KAHER, Belagavi as part of requirement towards the completion of MD degree, review and publishing.

In case of the queries during study or in future you may contact following persons,

1. *** ***** Chairman,
J.N.M.C Ethical Committee for Human Research,
JNMC, Belagavi.
***** *****

2. Dr. ***** *****
Associate Professor
Dept of General Medicine,
JNMC, Belagavi.
***** *****

3. Dr. *** **** ****
Investigator,
PG in General Medicine,
JNMC, Belagavi.
**** *****

CONSENT FORM

I voluntarily agree to take part in this study by signing below. I may withdraw at any time. I am not giving up any of my legal rights by signing this form. My signature below indicates that I have read this consent form, or it has been read to me and has been explained to me in my vernacular language and all my questions have been answered. I will be given a copy of this consent form.

Signature / Left Thumb print of the Participant or legally authorized representative

Participant's name :……...

Signature / Left thumb impression :……...

of the participant

Name of the legally authorized :……...

representative / guardian

Signature / Left thumb impression :……...

Witness' name :……...

Signature / Left thumb impression :……...

Investigator's name and signature :……...

Date:

Place:

ANNEXURE II – PROFORMA

CASE No:

NAME: **AGE/SEX:**

IP NO: **ADDRESS:**

OCCUPATION: **RELIGION:**

NATIVE ORIGIN:

COMPLAINTS AT PRESENTATION:

Easy fatigability	Yes / No
Generalised weakness	Yes / No
Lethargy/disinterest in daily activities	Yes / No
Anorexia	Yes / No
Swelling of limbs/face	Yes / No
Weight gain	Yes / No
Constipation	Yes / No
Heat intolerance,	Yes / No
Sweating	Yes / No
Palpitations	Yes / No
Weight loss	Yes / No
Increased appetite	Yes / No
Diarrhoea	Yes / No
Tremors	Yes / No
Swelling in neck	Yes / No

PAST HISTORY:

Similar Complaints

Treatment for the same

TREATMENT HISTORY:

Associated diseases

Operative procedure

Drugs history

FAMILY HISTORY:

Thyroid Disorder in any member

Genetic Disorders

Consanguinity

PERSONAL HISTORY:

Diet History

PHYSICAL EXAMINATION:

GENERAL CONDITION:

Pallor:	Yes/No
Icterus:	Yes/No
Lymphadenopathy:	Yes/No
Cyanosis:	Yes/No
Clubbing:	Yes/No
Edema:	Yes/No
Dry/coarse skin:	Yes/No
Hoarseness:	Yes/No
Goitre:	Yes/No

VITALS:

Temperature:

Pulse:

Respiratory rate:

Blood pressure:

Systemic examination:

R.S.:

CVS:

PA:

CNS:

INVESTIGATIONS:

THYROID FUNCTION TESTS

- TSH ,
- FREE T3,
- FREE T4,
- TPO ANTIBODIES.

DIAGNOSIS:

- Hypothyroidism
- Hyperthyroidism
- Subclinical

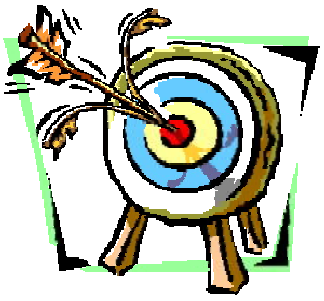
ANNEXURE III – KEY TO MASTER CHART

µg/dL	-	Micrograms per deciliter
^{0}F	-	Degree Fahrenheit
A	-	Absent
AKT	-	Anti Koch's treatment
Asth	-	Asthma
B plex	-	Vitamin B complex
bpm	-	Beats per minute
Brn	-	Bronchitis
Brnchd	-	Bronchodilator
Bs	-	Business
CABG	-	Coronary artery bypass graft
DM	-	Diabetes mellitus
F	-	Female
Fm	-	Farmer
Hmr	-	Haemorrhoids
HMRD	-	Haemorrhoidectomy
HTN	-	Hypertension
Hw	-	House wife
Hyperth	-	Hyperthyroidism
Hypoth	-	Hypothyroidism
IHD	-	Ischaemic heart disease
Inh	-	Inhaler
Iron Suppli	-	Iron supplementation

IU/mL	-	International units per milliliter
Kg/m^2	-	Kilograms per square meter
M	-	Male
mcIU/mL	-	Micro international units per milliliter
Med	-	Medication
mm Hg	-	Millimeters of mercury
Mod	-	Moderate
Multivit	-	Multivitamin
Mx	-	Mixed
NAD	-	No abnormality detected
Ng/mL	-	Nano grams per milliliter
Nr	-	Normal
P	-	Present
Pr	-	Professional
PTB	-	Pulmonary tuberculosis
PTCA	-	Percutaneous transluminal coronary angioplasty
Sk	-	Skilled labour
Sl	-	Sluggish
Sm	-	Smoking
Sr	-	Service
Sub-hyper	-	Subclinical hyperthyroidism
Sub-hypo	-	Subclinical hypothyroidism
T3	-	Triiodothyronine
T4	-	Thyroxine
Tb	-	Tobacco

TPO	-	Thyroperoxidase
TSH	-	Thyroid stimulating hormone
TVD	-	Triple vessel disease
Veg	-	Vegetarian

Introduction



Objectives

Review of Literature

Methodology

Results

Discussion

Conclusion

Summary

Bibliography

Annexure-I

Annexure-II

Annexure-III

Serial number	In/Out patient number	Age (Years)	History								Investigations				Thyroid abnormality
			Past history	Vital signs											
			Similar complaints (Duration [Year])	Pulse (bpm)	BP (mmHg)		Respiratory rate	Temperature (^{0}F)	BMI - kg/m2	T3 - ng/ml	T4 - µg/dl	TSH - mcIU/ml	TPO antibodies - IU/ml	
					Systolic	Diastolic								
1		81	-	80	130	70	18	98.2	20	0.76	4.21	1.03	2	-
2		71	2	62	140	80	20	97.4	28.1	0.8	9.2	12.02	400	+
3		62	-	70	130	80	20	98.2	28.1	1.2	4.4	14.01	200	+
4		63	-	80	150	90	18	98.7	22.9	1.2	5.2	2.2	0	-
5		85	-	60	150	80	21	97.7	17.7	1	6	2.3	4	-
6		64	-	72	120	80	16	98.3	29.6	1.3	5.6	2.2	0	-
7		62	3	80	150	90	14	99	21.4	1.1	7.2	3.78	0	-
8		67	-	90	140	90	18	98.1	22.7	0.8	7.2	4.2	0	-
9		83	-	101	140	80	22	99.2	27.6	4.92	14.8	0.01	0	+
10		72	-	110	160	90	20	99.1	17.9	6.2	25.8	0.01	0	+
11		82	-	90	140	90	20	97.6	24.4	2.68	14.98	0.03	0	+
12		64	-	95	138	86	16	98.2	32.3	1.22	11.6	3.82	0	-
13		73	3	80	160	90	18	98.2	24.3	0.8	3.6	0.56	0	-
14		68	1	101	144	78	20	98.9	19.5	1.1	11.6	0.86	0	-
15		62	-	65	138	70	22	97.6	23.5	1.2	3.8	48.6	500	+
16		66	4	100	130	80	20	98.2	25.9	1.2	11.6	4.28	5	-
17		72	-	60	130	80	13	99	34.1	1.2	10.6	0.58	30	-
18		64	-	72	140	90	20	99.1	23.8	0.98	10.8	0.65	25	-
19		79	5	90	120	80	14	98.6	25.39	1.2	8.9	0.98	25	-
20		80	-	80	150	90	20	98.2	26.1	1.29	8.6	3.78	29	-
21		78	4	100	140	80	16	98.7	33.5	5.28	1.16	14.8	500	+
22		73	-	110	130	80	18	99.1	20.3	1.46	9.45	0.39	0	+
23		61	-	98	130	80	20	98.4	22.8	1.28	11.28	4.08	0	-
24		78	-	80	140	80	20	98.3	25.3	1.98	12.1	0.01	0	+
25		60	-	90	130	80	18	98.2	23.6	1.2	8.6	3.86	0	-
26		76	5	98	150	90	18	99	21.3	1.43	11.8	0.98	0	-
27		62	-	50	130	80	18	99	20.94	0.23	2.2	85	800	+
28		65	-	62	140	80	17	98.4	28.8	1.58	6.82	15.9	400	+
29		63	-	66	130	80	21	97.8	21	1.2	5.4	0.87	0	-
30		62	-	80	130	80	20	97.6	24.3	3.6	14.6	0.32	0	+
31		63	-	60	130	80	12	98.3	22	1.48	11.2	0.89	0	-
32		64	-	58	140	80	20	99	25.5	0.98	4.8	0.88	0	-

33		64	2	70	140	90	14	96.5	28	1.2	12.8	0.99	0	-
34		60	-	48	130	80	17	98.2	25.9	0.53	2.3	75.2	900	+
35		78	-	82	140	90	14	98.6	23.6	0.99	3.86	0.89	0	-
36		87	-	78	130	80	20	98.4	23.57	1.68	10.98	0.86	0	-
37		63	-	80	140	80	15	97.2	21.82	1.12	9.86	0.86	0	-
38		62	-	66	150	80	17	97.8	23.8	1.42	6.68	18.98	600	+
39		60	-	98	140	80	14	96.8	31.25	1.48	11.98	0.8	0	-
40		63	-	90	130	80	20	98.8	20.67	1.2	10.68	4.78	0	-
41		66	5	80	140	90	13	99	25.9	1.82	12.8	3.36	0	-
42		65	2	48	150	100	21	98.3	26.7	0.54	3.1	86.3	98	+
43		73	-	99	150	80	15	98.6	31.25	1.16	7.43	4.3	0	-
44		63	-	58	130	80	18	98.1	24.4	0.98	5.54	86.2	300	+
45		68	-	78	140	80	22	99	31.67	0.88	5.39	4.28	0	-
46		77	-	80	120	80	15	99	27.7	1.103	8.68	4.23	0	-
47		80	-	66	140	90	12	98.7	25	1.8	12.6	4.78	0	-
48		61	-	99	140	80	20	98.6	32	1.24	8.98	2.23	0	-
49		62	-	90	150	90	20	98.4	24.4	1.12	11.6	4.82	0	-
50		64	4	54	140	80	20	99.1	27.3	0.38	4.08	66.2	600	+
51		63	-	90	140	80	21	97.8	28.6	0.54	3.1	3.98	0	-
52		70	-	79	140	90	22	99	24.1	0.54	4.82	4.78	0	-
53		65	-	98	120	80	18	98.9	26.8	1.92	3.12	4.98	0	-
54		77	5	80	130	80	16	98.7	26.6	1.23	12.6	4.86	0	-
55		71	-	86	140	80	16	98.6	28.3	1.82	13.2	2.13	0	-
56		61	-	50	130	80	18	98.4	32.1	0.28	3.3	88.2	800	+
57		74	-	78	130	80	12	98.23	23.8	1.48	3.3	4.72	0	-
58		63	-	80	130	80	14	98.2	27.3	0.89	4.86	4.32	0	-
59		63	-	80	130	80	20	98.9	29.5	1.24	3.21	4.31	0	-
60		64	-	64	130	80	21	99.2	27.64	0.82	3.48	4.11	0	-
61		63	-	70	130	80	18	99	20.5	1.42	11.2	0.86	0	-
62		80	-	72	130	80	18	98.4	24.8	1.48	8.62	3.86	0	-
63		60	2	82	120	80	18	98.5	32.9	1.42	7.86	3.26	0	-
64		71	-	65	130	80	20	96.4	20.61	1.28	6.62	13.98	400	+
65		70	-	82	140	80	20	97.6	21.6	0.86	3.48	2.28	0	-
66		82	1	63	148	62	16	98.9	27.8	0.62	10.32	4.82	0	-
67		83	-	70	142	78	15	99	25.1	0.76	11.82	0.86	0	-
68		64	-	62	162	82	17	98.2	30.8	0.53	5.4	75	335	+
69		60	-	68	138	68	14	98.4	25.1	1.42	11.28	0.82	0	-
70		71	-	68	130	80	16	97.2	26.5	0.82	3.1	4.38	0	-
71		64	-	82	128	86	18	98.5	23.8	1.12	5.82	23.98	403	+
72		74	-	80	130	80	20	99.2	28.3	1.81	3.92	4.82	0	-
73		62	-	54	138	76	18	98.8	25.3	0.81	4.28	84.54	843	+
74		61	-	80	140	80	18	99.8	30.71	0.54	4.98	4.28	0	-
75		62	5	82	148	96	15	97.8	26.9	1.42	11.82	3.87	0	-
76		71	-	86	138	76	16	98.6	29.7	1.48	3.02	0.98	0	-
77		61	-	52	152	98	15	98.9	21.3	0.63	4.82	54.3	103	+
78		65	-	77	136	84	18	97.9	27.1	1.98	3.42	4.82	0	-
79		67	-	70	128	76	12	99.2	24.1	1.12	5.68	16.9	202	+
80		82	-	90	146	84	19	98.82	27.3	1.1	3.3	0.89	0	-
81		68	-	66	148	78	17	98.6	25.7	1.08	7.23	15.5	253	+
82		63	-	80	138	72	20	98.5	22.3	0.78	3.38	46.8	524	+
83		77	-	72	142	86	18	99	27.7	0.82	3.48	15.43	108	+
84		64	-	60	136	78	20	97.4	26.4	1.28	11.86	3.38	0	-

85		61	-	88	142	86	20	98.2	25.31	1.82	12.62	4.78	0	-
86		67	-	77	138	70	20	98.2	24	1.1	4.2	4.78	0	-
87		64	-	62	148	72	18	96.8	23.5	1.23	9.28	4.92	0	-
88		61	-	78	138	78	18	97.8	27.8	1.48	11.76	4.82	0	-
89		63	-	80	142	86	16	98.9	20	0.86	3.32	3.98	0	-
90		62	-	80	136	90	18	97.8	21.3	1.48	7.78	2.28	0	-
91		62	-	70	128	78	15	97.6	30	1.12	12.6	4.76	0	-
92		69	-	92	138	90	12	97.6	24.8	1.42	11.28	3.8	0	-
93		62	-	82	128	76	12	97.6	23.8	1.43	3.12	4.32	0	-
94		62	2	80	138	72	12	97.9	20.8	1.7	7.82	3.38	0	-
95		61	-	72	130	80	16	98.2	20.3	1.62	11.78	4.23	0	-
96		68	-	60	132	72	15	99.2	24.8	1.03	2.82	4.32	0	-
97		61	2	68	140	86	18	97.1	23	1.48	5.58	3.38	0	-
98		61	-	70	112	86	16	97.3	20.7	0.88	3.12	0.73	0	-
99		76	-	80	138	76	17	98.4	25.1	0.98	11.91	1.1	0	-
##		62	-	50	146	72	18	98.4	26.6	0.8	4.28	54.43	208	+

67.79	3.17	76.61	137.32	81.44	17.50	98.34	25.38	1.32	7.69	12.31	95.97
7.21	1.47	14.25	9.09	6.32	2.70	0.66	3.60	0.88	4.13	22.82	211.82
64.00	3.00	80.00	138.00	80.00	18.00	98.40	25.10	1.20	7.20	4.10	0.00
60.00	1.00	48.00	112.00	62.00	12.00	96.40	17.70	0.23	1.16	0.01	0.00
87.00	5.00	110.00	162.00	100.00	22.00	99.80	34.10	6.20	25.80	88.20	900.00

Age (Years)
complaints (Durast history
Pulse (bpm)ital signs
Systolic BP (mmHg)
Diastolic
Respiratory rate
Temperature (0F)
BMI - kg/m2
T3 - ng/ml
T4 - µg/dl
TSH - mcIU/ml
PO antibodies - IU/ml

Diagnosis
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Sub- Hypo
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ANNEXURE III - MASTER CHART

					Chief complaints														History									
																			Past history		Personal history		Treatment history				Famil histor	
Serial number	In/Out patient number	Age (Years)	Sex	Occupation	Easy Fatiguability	Generalised weakness	Lethargy / Dysinterest in daily activities	Anorexia	Swelling of limbs/face	Weight gain	Constipation	Heat intolerance	Sweating	Palpitations	Weight loss	Increased appetite	Diarrhoea	Tremors	Swelling in Neck	Similar complaints (Duration [Year])	Treatment for same	Diet history	Habits	Associated diseases	Associated diseases	Operative procedure	Drugs history	History of Thyroid disorder in any member	Genetic disorders
1	3377804	81	F	Hw	P	P	P	A	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	P	A
2	3524348	71	F	Fm	P	P	P	A	A	P	A	A	A	A	A	A	A	A	A	2	Iron Suppli	Mx	Tb	HTN	P	-	Anti-HTN	P	A
3	4071295	62	F	Sr	P	P	P	P	P	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	-	A	-	-	A	A
4	3674791	63	F	Hw	P	P	P	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	HTN	P	-	Anti-HTN	A	A
5	1332633	85	F	Hw	P	P	P	A	P	A	P	A	A	A	P	A	A	A	A	-	-	Mx	Sm	HTN	P	-	Anti-HTN	A	A
6	3347702	64	F	Bs	P	P	P	A	A	P	A	A	A	A	A	A	A	A	A	-	-	Veg	-	DM	P	-	Anti-DM	P	A
7	833851	62	F	Fm	P	P	P	A	A	A	A	P	P	A	P	A	A	A	A	3	B plex	Veg	-	-	A	-	-	P	A
8	3306068	67	F	Fm	P	P	P	A	A	A	A	A	P	P	A	A	A	P	A	-	-	Mx	-	-	A	-	-	A	A
9	2952803	83	M	Sr	A	A	A	A	A	A	A	A	A	P	A	A	A	A	A	-	-	Mx	Tb	-	A	-	-	A	A
10	603968	72	F	Fm	A	A	A	A	A	A	A	P	P	P	P	P	A	P	A	-	-	Mx	-	DM, HTN	P	-	Anti-DM, HTN	A	A
11	4156045	82	F	Bs	A	A	A	A	A	A	A	A	A	A	A	P	A	A	A	-	-	Mx	Tb	DM, HTN	P	-	Anti-DM, HTN	P	A
12	3676698	64	F	Sr	P	P	A	A	A	P	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	A	A
13	119348	73	F	Hw	P	P	P	A	P	A	A	A	P	A	A	A	A	A	A	3	B plex	Mx	-	HTN	P	-	Anti-HTN	A	A
14	4358691	68	M	Sr	A	A	A	P	A	A	P	A	P	P	P	A	A	A	A	1	Iron and multi vit	Veg	-	-	A	-	-	P	A
15	4370439	62	F	Sr	P	P	P	P	P	P	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	P	A
16	4351759	66	F	Fm	P	P	P	A	A	A	A	A	A	A	A	A	A	A	A	4	Iron Suppli	Mx	-	-	A	-	-	P	A
17	3911923	72	F	Bs	P	P	A	A	A	P	A	A	A	A	A	A	A	A	A	-	-	Mx	-	DM	P	-	Anti-DM	A	A
18	4391794	64	F	Sr	P	P	P	A	A	A	P	A	P	A	A	A	A	A	A	-	-	Veg	-	IHD	P	-	IHD Med	A	A
19	2459597	79	F	Sk	P	P	P	A	A	A	A	A	A	A	A	A	A	P	A	5	blood, multivit	Veg	-	Hmr	P	HMRD	-	A	A
20	848109	80	F	Sr	P	P	P	P	A	A	P	A	A	A	A	A	A	P	A	-	-	Veg	-	-	A	-	-	A	A
21	3774138	78	M	Sk	P	P	P	A	A	P	P	A	A	A	A	A	A	A	A	4	Iron Suppli	Mx	-	-	A	-	-	P	A

ANNEXURE III - MASTER CHART

Serial number	In/Out patient number	Age (Years)	Sex	Occupation	Chief complaints														History									
																			Past history		Personal history		Treatment history				Famil histor	
					Easy Fatiguability	Generalised weakness	Lethargy / Dysinterest in daily activities	Anorexia	Swelling of limbs/face	Weight gain	Constipation	Heat intolerance	Sweating	Palpitations	Weight loss	Increased appetite	Diarrhoea	Tremors	Swelling in Neck	Similar complaints (Duration [Year])	Treatment for same	Diet history	Habits	Associated diseases	Associated diseases	Operative procedure	Drugs history	History of Thyroid disorder in any member	Genetic disorders
22	849339	73	F	Sr	A	A	A	A	A	A	A	P	P	P	P	P	A	P	A	-	-	Veg	-	DM, HTN	P	-	Anti-DM, HTN	P	A
23	850585	61	F	Sr	P	P	P	A	A	A	A	A	P	A	A	A	A	A	A	-	-	Mx	-	-	A	-	-	A	A
24	849242	78	F	Fm	A	A	A	A	A	A	A	A	P	A	A	A	A	A	A	-	-	Veg	-	Asth	P	-	Brnch	A	A
25	849837	60	F	Sr	P	P	P	A	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	P	A
26	1472173	76	F	Hw	P	P	P	A	A	A	A	A	A	A	A	A	A	P	A	5	Multivit	Veg	-	HTN	P	-	Anti-HTN	A	A
27	4456179	62	F	Sr	P	P	P	P	A	A	P	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	P	A
28	2318414	65	F	Hw	P	P	A	A	P	P	A	A	A	A	A	A	A	A	A	-	-	Veg	-	IHD	P	-	Anti-IHD	A	A
29	848815	63	M	Sr	P	P	A	A	A	A	A	P	A	P	A	A	A	A	A	-	-	Mx	-	-	A	-	-	P	A
30	4421549	62	F	Hw	P	A	A	A	A	A	A	A	A	A	A	P	A	A	A	-	-	Mx	-	-	A	-	-	P	A
31	4162175	63	F	Hw	P	P	P	A	A	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	DM	P	-	Anti-DM	P	A
32	4288549	64	F	Fm	P	P	A	A	A	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	Brn	P	-	Inh	A	A
33	4333256	64	F	Fm	P	P	P	P	A	A	A	A	A	A	A	A	A	A	A	2	Multivit	Mx	-	DM, HTN	P	-	-	P	A
34	4336908	60	F	Sr	P	P	P	P	P	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	-	A	-	-	P	A
35	849490	78	F	Fm	P	P	P	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	HTN	P	-	-	P	A
36	849932	87	F	Sr	P	P	P	A	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	P	A
37	847069	63	F	Fm	P	P	A	P	P	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	Asth	P	-	Brnch	A	A
38	1307803	62	F	Pr	P	P	P	A	P	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	-	A	-	Anti-HTN	P	A
39	3599886	60	M	Fm	P	P	P	A	A	A	A	A	A	P	A	P	A	A	A	-	-	Mx	-	-	A	-	-	A	A
40	1298905	63	F	Bs	P	P	A	A	A	A	A	A	A	A	P	P	P	A	A	-	-	Veg	-	-	A	-	-	P	A
41	849688	66	F	Bs	P	P	P	A	A	A	A	A	A	A	A	A	A	A	A	5	Iron and multi vit	Mx	-	DM	P	-	Anti-DM	A	A
42	4250515	65	F	Sr	P	P	P	P	P	P	P	A	A	A	A	A	A	A	A	2	Multivit	Mx	-	IHD	P	-	Anti-IHD	P	A

ANNEXURE III - MASTER CHART

Serial number	In/Out patient number	Age (Years)	Sex	Occupation	Chief complaints														History									
																			Past history		Personal history		Treatment history				Famil histor	
					Easy Fatiguability	Generalised weakness	Lethargy / Dysinterest in daily activities	Anorexia	Swelling of limbs/face	Weight gain	Constipation	Heat intolerance	Sweating	Palpitations	Weight loss	Increased appetite	Diarrhoea	Tremors	Swelling in Neck	Similar complaints (Duration [Year])	Treatment for same	Diet history	Habits	Associated diseases	Associated diseases	Operative procedure	Drugs history	History of Thyroid disorder in any member	Genetic disorders
43	4348104	73	F	Fm	P	P	A	A	A	A	P	A	A	P	A	A	A	A	A	-	-	Mx	-	HTN	P	-	Anti-HTN	A	A
44	4400864	63	F	Hw	P	P	P	P	P	P	P	A	A	A	A	A	A	A	A	-	-	Mx	-	DM	P	-	Anti-DM	P	A
45	4370921	68	M	Sr	P	P	P	P	A	A	A	A	A	A	A	P	A	A	A	-	-	veg	-	Asth	P	-	Inh	P	A
46	4331113	77	M	Sr	P	P	A	A	A	A	P	A	A	A	A	P	A	A	A	-	-	Mx	-	-	A	-	-	A	A
47	4280576	80	M	Sr	P	P	A	A	A	A	A	P	A	A	A	P	A	A	A	-	-	Mx	-	DM	P	-	Anti-DM	P	A
48	4424579	61	M	Pr	P	P	A	A	A	A	A	A	A	P	A	A	A	P	A	-	-	Veg	-	-	A	-	-	A	A
49	3693868	62	M	Pr	P	P	P	P	A	A	A	A	A	A	A	P	A	A	A	-	-	Mx	-	TVD	P	CABG	-	A	A
50	3501811	64	F	Pr	P	P	P	P	P	P	P	A	A	A	A	A	A	A	A	4	Multivit	Mx	-	HTN	P	-	Anti-HTN	P	A
51	2611435	63	F	Sr	P	P	P	P	A	A	A	A	A	A	A	A	A	P	A	-	-	Veg	-	HTN	P	-	Anti-HTN	P	A
52	3606309	70	F	Hw	P	P	P	A	P	P	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	A	A
53	4058327	65	F	Sr	P	P	P	A	A	A	A	A	A	A	P	A	A	P	A	-	-	Mx	-	DM	P	-	Anti-DM	A	A
54	3233211	77	F	Fm	P	P	P	A	A	A	A	P	A	A	A	A	A	P	A	5	Multivit	Veg	-	PTB	P	-	AKT	A	A
55	849161	71	M	Sr	P	P	A	A	A	P	A	P	A	A	A	P	A	A	A	-	-	Mx	-	DM	P	-	Anti-DM	A	A
56	3727234	61	F	Pr	P	P	P	P	P	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	-	A	-	-	P	A
57	4021937	74	M	Fm	P	P	A	A	A	A	A	A	P	A	P	A	A	A	A	-	-	Veg	-	-	A	-	-	A	A
58	2765026	63	M	Sr	P	P	P	A	A	A	A	P	A	A	A	A	A	A	A	-	-	Veg	-	IHD	P	-	Anti-IHD	A	A
59	3765421	63	M	Sr	P	P	A	P	A	A	A	A	A	A	P	A	A	P	A	-	-	Mx	-	-	A	-	-	A	A
60	849242	64	M	Pr	P	P	A	P	A	A	P	P	A	A	A	A	A	A	A	-	-	Mx	-	IHD	P	PTCA, Stent	-	A	A
61	4210810	63	F	Hw	P	P	A	A	A	A	A	A	A	A	P	A	A	P	A	-	-	Mx	-	HTN	P	-	Anti-HTN	A	A
62	4448789	80	M	Fm	P	P	A	P	A	A	P	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	A	A
63	4537588	60	F	Bs	P	P	P	P	A	A	A	A	A	P	A	A	A	P	A	2	Multivit	Veg	-	-	A	-	-	P	A

ANNEXURE III - MASTER CHART

Serial number	In/Out patient number	Age (Years)	Sex	Occupation	Chief complaints														History									
																			Past history		Personal history		Treatment history				Famil histor	
					Easy Fatiguability	Generalised weakness	Lethargy / Dysinterest in daily activities	Anorexia	Swelling of limbs/face	Weight gain	Constipation	Heat intolerance	Sweating	Palpitations	Weight loss	Increased appetite	Diarrhoea	Tremors	Swelling in Neck	Similar complaints (Duration [Year])	Treatment for same	Diet history	Habits	Associated diseases	Associated diseases	Operative procedure	Drugs history	History of Thyroid disorder in any member	Genetic disorders
64	849133	71	M	Bs	P	P	A	A	P	A	P	A	A	A	A	A	A	A	A	-	-	Mx	-	DM	P	-	Anti-DM	A	A
65	3465421	70	M	Sr	P	P	P	A	A	P	A	P	A	A	A	A	A	A	A	-	-	Mx	-	-	A	-	-	A	A
66	2240999	82	M	Fm	P	P	P	A	A	A	A	A	P	A	A	P	A	A	A	1	Iron and multi vit	Mx	-	IHD	P	PTCA, Stent	-	P	A
67	850441	83	M	Sr	P	P	P	P	A	A	P	A	A	A	A	A	A	A	A	-	-	Veg	-	IHD	P	-	Anti-IHD	A	A
68	4472489	64	F	Sr	P	P	P	P	A	A	P	A	A	P	A	A	A	A	A	-	-	Mx	-	HTN	P	-	Anti-HTN	P	A
69	3793862	60	M	Sk	P	P	A	A	A	A	A	A	A	A	P	P	A	A	A	-	-	Veg	-	-	A	-	-	P	A
70	871273	71	F	Fm	P	P	P	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	A	A
71	872091	64	F	Bs	P	P	A	A	P	A	P	A	A	A	A	A	A	A	A	-	-	Veg	-	HTN	P	-	Anti-HTN	P	A
72	4735896	74	F	Hw	P	P	P	A	A	A	A	A	A	A	A	P	A	A	A	-	-	Mx	-	DM	P	-	Anti-DM	P	A
73	872774	62	F	Sr	P	P	P	P	A	P	A	A	A	A	A	A	A	A	A	-	-	Veg	-	IHD	P	PTCA, Stent	-	A	A
74	870118	61	F	Bs	P	P	P	A	P	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	HTN	P	-	Anti-HTN	P	A
75	4280510	62	M	Sr	P	P	A	P	A	A	P	A	A	A	A	A	A	A	A	5	Iron and multi vit	Mx	-	-	A	-	-	A	A
76	872529	71	F	Fm	P	P	P	A	A	A	A	A	P	A	A	A	A	P	A	-	-	Mx	-	PTB	P	-	AKT	P	A
77	2825030	61	M	Sr	P	P	P	A	P	P	A	A	A	A	A	A	A	A	A	-	-	Veg	-	DM, HTN	P	-	Anti- HTN,DM	P	A
78	849490	65	M	Fm	P	P	P	A	A	P	A	A	P	A	A	A	A	A	A	-	-	Mx	-	HTN	P	-	Anti-HTN	A	A
79	3605951	67	M	Fm	P	P	A	A	A	P	A	A	A	A	A	A	A	A	A	-	-	Mx	-	-	A	-	-	P	A
80	873211	82	F	Fm	P	P	P	A	A	A	A	A	P	A	A	A	A	P	A	-	-	Veg	-	-	A	-	-	A	A
81	849931	68	F	Fm	P	P	A	P	A	A	P	A	A	A	A	A	A	A	A	-	-	Mx	-	-	A	-	-	P	A
82	849822	63	F	Hw	P	P	A	A	P	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	HTN	P	-	Anti-HTN	P	A
83	850110	77	M	Sr	P	P	A	P	A	P	A	A	A	A	A	A	A	A	A	-	-	Veg	-	IHD	P	PTCA, stent	-	P	A
84	774714	64	M	Hw	P	P	P	A	A	P	A	A	A	A	A	A	A	A	A	-	-	Mx	-	DM	P	-	Anti-DM	A	A

ANNEXURE III - MASTER CHART

					Chief complaints														History									
																			Past history		Personal history		Treatment history				Famil histor	
Serial number	In/Out patient number	Age (Years)	Sex	Occupation	Easy Fatiguability	Generalised weakness	Lethargy / Dysinterest in daily activities	Anorexia	Swelling of limbs/face	Weight gain	Constipation	Heat intolerance	Sweating	Palpitations	Weight loss	Increased appetite	Diarrhoea	Tremors	Swelling in Neck	Similar complaints (Duration [Year])	Treatment for same	Diet history	Habits	Associated diseases	Associated diseases	Operative procedure	Drugs history	History of Thyroid disorder in any member	Genetic disorders
85	1413737	61	M	Sr	P	P	P	A	A	A	A	A	A	A	P	A	A	A	A	-	-	Veg	-	-	A	-	-	P	A
86	873129	67	F	Hw	P	P	P	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	IHD	P	-	Anti-IHD	A	A
87	4280570	64	M	Fm	P	P	A	A	A	A	A	A	A	A	P	A	A	P	A	-	-	Veg	-	-	A	-	-	A	A
88	878809	61	M	Sr	P	P	P	A	A	A	A	A	A	P	A	A	A	A	A	-	-	Veg	-	HTN	P	-	Anti-HTN	A	A
89	848815	63	F	Fm	P	P	P	A	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	A	A
90	850971	62	F	Hw	P	P	A	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	DM	P	-	Anti-DM	A	A
91	850441	62	F	Fm	P	P	P	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	P	A
92	850110	69	F	Fm	P	P	A	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	A	A
93	870023	62	F	Fm	P	P	A	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	IHD, HTN	P	-	Anti-HTN, PTCA	A	A
94	3928461	62	F	Hw	P	P	P	P	A	A	A	A	A	P	A	A	A	A	A	2	Iron and multi vit	Mx	-	-	A	-	-	P	A
95	3418368	61	M	Sr	P	P	A	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	HTN	P	-	Anti-HTN	A	A
96	848109	68	F	Fm	P	P	A	P	P	A	A	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	A	A
97	746634	61	F	Hw	P	P	A	A	A	A	A	P	A	A	A	A	A	A	A	2	Multivit	Veg	-	HTN	P	-	Anti-HTN	A	A
98	4231541	61	M	Fm	P	P	A	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	-	A	-	-	P	A
99	849837	76	F	Bs	P	P	P	P	A	A	A	A	A	A	A	A	A	A	A	-	-	Mx	-	-	A	-	-	P	A
100	3826461	62	M	Sr	P	P	P	A	A	P	P	A	A	A	A	A	A	A	A	-	-	Veg	-	-	A	-	-	P	A

ANNEXURE III - MASTER CHART

Serial number	In/Out patient number	General physical examination																Ankle jerk	Systemic examination				Investigations				Diagnosis
		yy										Vital signs															
													Blood pressure														
		Consanguinity	Pallor	Icterus	Lymphadenopathy	Cyanosis	Clubbing	Edema	Dry/coarse skin	Hoarseness	Goitre	Pulse (bpm)	Systolic (mmHg)	Diastolic (mmHg)	Respiratory rate	Temperature (^{0}F)	Body mass index (Kg/m^2)		Respiratory system	Cardiovascular system	Per abdomen	Central nervous system	T3 - ng/mL	T4 - µg/dL	TSH - mcIU/mL	TPO antibodies - IU/ml	
1	3377804	A	Mild	A	A	A	A	A	A	A	A	80	130	70	18	98.2	20	Nr	NAD	NAD	NAD	NAD	0.76	4.21	1.03	2	Nr
2	3524348	A	-	A	A	A	A	A	A	A	A	62	140	80	20	97.4	28.1	Nr	NAD	NAD	NAD	NAD	0.80	9.20	12.02	400	Sub-Hypo
3	4071295	A	Mild	A	A	A	A	P	A	A	A	70	130	80	20	98.2	28.1	Sl	NAD	NAD	NAD	NAD	1.20	4.40	14.01	200	Sub-Hypo
4	3674791	A	-	A	A	A	A	A	A	A	A	80	150	90	18	98.7	22.9	Nr	NAD	NAD	NAD	NAD	1.20	5.20	2.20	0	Nr
5	1332633	A	Mod	A	A	A	A	P	A	A	A	60	150	80	21	97.7	17.7	Nr	NAD	NAD	NAD	NAD	1.00	6.00	2.30	4	Nr
6	3347702	A	-	A	A	A	A	A	A	A	A	72	120	80	16	98.3	29.6	Nr	NAD	NAD	NAD	NAD	1.30	5.60	2.20	0	Nr
7	833851	A	-	A	A	A	A	A	P	A	A	80	150	90	14	99	21.4	Nr	NAD	NAD	NAD	NAD	1.10	7.20	3.78	0	Nr
8	3306068	A	-	A	A	A	A	A	A	A	A	90	140	90	18	98.1	22.7	Hyper	NAD	NAD	NAD	NAD	0.80	7.20	4.20	0	Nr
9	2952803	A	-	A	A	A	A	A	A	A	A	101	140	80	22	99.2	27.6	Nr	NAD	NAD	NAD	NAD	4.92	14.80	0.01	0	Sub-Hyper
10	603968	A	-	A	A	A	A	A	A	A	A	110	160	90	20	99.1	17.9	Hyper	NAD	NAD	NAD	NAD	6.20	25.80	0.01	0	Hyperth
11	4156045	A	Mild	A	A	A	A	A	A	A	A	90	140	90	20	97.6	24.4	Hyper	NAD	NAD	NAD	NAD	2.68	14.98	0.03	0	Sub-Hyper
12	3676698	A	-	A	A	A	A	A	A	A	A	95	138	86	16	98.2	32.3	Nr	NAD	NAD	NAD	NAD	1.22	11.60	3.82	0	Nr
13	119348	A	-	A	A	A	A	A	A	A	A	80	160	90	18	98.2	24.3	Nr	NAD	NAD	NAD	NAD	0.80	3.60	0.56	0	Nr
14	4358691	A	-	A	A	A	A	A	A	A	A	101	144	78	20	98.9	19.5	Nr	NAD	NAD	NAD	NAD	1.10	11.60	0.86	0	Nr
15	4370439	A	-	A	A	A	A	P	P	A	A	65	138	70	22	97.6	23.5	Sl	NAD	NAD	NAD	NAD	1.20	3.80	48.60	500	Hypoth
16	4351759	A	Mild	A	A	A	A	A	A	A	A	100	130	80	20	98.2	25.9	Nr	NAD	NAD	NAD	NAD	1.20	11.60	4.28	5	Nr
17	3911923	A	Mod	A	A	A	A	A	A	A	A	60	130	80	13	99	34.1	Nr	NAD	NAD	NAD	NAD	1.20	10.60	0.58	30	Nr
18	4391794	A	-	A	A	A	A	A	A	A	A	72	140	90	20	99.1	23.8	Nr	NAD	NAD	NAD	NAD	0.98	10.80	0.65	25	Nr
19	2459597	A	-	A	A	A	A	A	A	A	A	90	120	80	14	98.6	25.39	Nr	NAD	NAD	NAD	NAD	1.20	8.90	0.98	25	Nr
20	848109	A	Mild	A	A	A	A	A	A	A	A	80	150	90	20	98.2	26.1	Nr	NAD	NAD	NAD	NAD	1.29	8.60	3.78	29	Nr
21	3774138	A	-	A	A	A	A	P	P	P	A	100	140	80	16	98.7	33.5	Sl	NAD	NAD	NAD	NAD	5.28	1.16	14.80	500	Sub-Hypo

ANNEXURE III - MASTER CHART

Serial number	In/Out patient number	General physical examination																Ankle jerk	Systemic examination				Investigations				Diagnosis
		yy										Vital signs															
													Blood pressure														
		Consanguinity	Pallor	Icterus	Lymphadenopathy	Cyanosis	Clubbing	Edema	Dry/coarse skin	Hoarseness	Goitre	Pulse (bpm)	Systolic (mmHg)	Diastolic (mmHg)	Respiratory rate	Temperature (^{0}F)	Body mass index (Kg/m^2)		Respiratory system	Cardiovascular system	Per abdomen	Central nervous system	T3 - ng/mL	T4 - µg/dL	TSH - mcIU/mL	TPO antibodies - IU/ml	
22	849339	A	-	A	A	A	A	A	A	A	A	110	130	80	18	99.1	20.3	Nr	NAD	NAD	NAD	NAD	1.46	9.45	0.39	0	Hyperth
23	850585	A	-	A	A	A	A	A	A	A	A	98	130	80	20	98.4	22.8	Nr	NAD	NAD	NAD	NAD	1.28	11.28	4.08	0	Nr
24	849242	A	-	A	A	A	A	A	A	A	A	80	140	80	20	98.3	25.3	Hyper	NAD	NAD	NAD	NAD	1.98	12.10	0.01	0	sub-hyper
25	849837	A	Mild	A	A	A	A	A	A	A	A	90	130	80	18	98.2	23.6	Nr	NAD	NAD	NAD	NAD	1.20	8.60	3.86	0	Nr
26	1472173	A	Mild	A	A	A	A	A	A	A	A	98	150	90	18	99	21.3	Nr	NAD	NAD	NAD	NAD	1.43	11.80	0.98	0	Nr
27	4456179	A	-	A	A	A	A	A	P	A	A	50	130	80	18	99	20.94	Sl	NAD	NAD	NAD	NAD	0.23	2.20	85.00	800	Hypoth
28	2318414	A	-	A	A	A	A	A	P	A	A	62	140	80	17	98.4	28.8	Nr	NAD	NAD	NAD	NAD	1.58	6.82	15.90	400	Sub-Hypo
29	848815	A	-	A	A	A	A	A	A	A	A	66	130	80	21	97.8	21	Nr	NAD	NAD	NAD	NAD	1.20	5.40	0.87	0	Nr
30	4421549	A	-	A	A	A	A	A	A	A	A	80	130	80	20	97.6	24.3	Nr	NAD	NAD	NAD	NAD	3.60	14.60	0.32	0	sub-hyper
31	4162175	A	-	A	A	A	A	A	A	A	A	60	130	80	12	98.3	22	Nr	NAD	NAD	NAD	NAD	1.48	11.20	0.89	0	Nr
32	4288549	A	-	A	A	A	A	A	A	A	A	58	140	80	20	99	25.5	Nr	NAD	NAD	NAD	NAD	0.98	4.80	0.88	0	Nr
33	4333256	A	-	A	A	A	A	A	A	A	A	70	140	90	14	96.5	28	Nr	NAD	NAD	NAD	NAD	1.20	12.80	0.99	0	Nr
34	4336908	A	-	A	A	A	A	A	P	P	A	48	130	80	17	98.2	25.9	Nr	NAD	NAD	NAD	NAD	0.53	2.30	75.20	900	Hypoth
35	849490	A	Mild	A	A	A	A	A	A	A	A	82	140	90	14	98.6	23.6	Nr	NAD	NAD	NAD	NAD	0.99	3.86	0.89	0	Nr
36	849932	A	Mild	A	A	A	A	A	A	A	A	78	130	80	20	98.4	23.57	Nr	NAD	NAD	NAD	NAD	1.68	10.98	0.86	0	Nr
37	847069	A	-	A	A	A	A	A	A	A	A	80	140	80	15	97.2	21.82	Nr	NAD	NAD	NAD	NAD	1.12	9.86	0.86	0	Nr
38	1307803	A	-	A	A	A	A	A	P	A	A	66	150	80	17	97.8	23.8	Sl	NAD	NAD	NAD	NAD	1.42	6.68	18.98	600	Sub-Hypo
39	3599886	A	-	A	A	A	A	A	A	A	A	98	140	80	14	96.8	31.25	Nr	NAD	NAD	NAD	NAD	1.48	11.98	0.80	0	Nr
40	1298905	A	Mild	A	A	A	A	A	A	A	A	90	130	80	20	98.8	20.67	Nr	NAD	NAD	NAD	NAD	1.20	10.68	4.78	0	Nr
41	849688	A	Mild	A	A	A	A	A	A	A	A	80	140	90	13	99	25.9	Nr	NAD	NAD	NAD	NAD	1.82	12.80	3.36	0	Nr
42	4250515	A	Mild	A	A	A	A	A	A	A	A	48	150	100	21	98.3	26.7	Sl	NAD	NAD	NAD	NAD	0.54	3.10	86.30	98	Hypoth

ANNEXURE III - MASTER CHART

Serial number	In/Out patient number		General physical examination															Ankle jerk	Systemic examination				Investigations				Diagnosis
		yy										Vital signs															
													Blood pressure														
		Consanguinity	Pallor	Icterus	Lymphadenopathy	Cyanosis	Clubbing	Edema	Dry/coarse skin	Hoarseness	Goitre	Pulse (bpm)	Systolic (mmHg)	Diastolic (mmHg)	Respiratory rate	Temperature (^{0}F)	Body mass index (Kg/m^2)		Respiratory system	Cardiovascular system	Per abdomen	Central nervous system	T3 - ng/mL	T4 - µg/dL	TSH - mcIU/mL	TPO antibodies - IU/ml	
43	4348104	A	-	A	A	A	A	A	P	A	A	99	150	80	15	98.6	31.25	Nr	NAD	NAD	NAD	NAD	1.16	7.43	4.30	0	Nr
44	4400864	A	-	A	A	A	A	P	P	P	A	58	130	80	18	98.1	24.4	Sl	NAD	NAD	NAD	NAD	0.98	5.54	86.20	300	Hypoth
45	4370921	A	-	A	A	A	A	A	A	A	A	78	140	80	22	99	31.67	Nr	NAD	NAD	NAD	NAD	0.88	5.39	4.28	0	Nr
46	4331113	A	-	A	A	A	A	A	P	A	A	80	120	80	15	99	27.7	Nr	NAD	NAD	NAD	NAD	1.10	8.68	4.23	0	Nr
47	4280576	A	-	A	A	A	A	A	A	A	A	66	140	90	12	98.7	25	Nr	NAD	NAD	NAD	NAD	1.80	12.60	4.78	0	Nr
48	4424579	A	-	A	A	A	A	A	A	A	A	99	140	80	20	98.6	32	Nr	NAD	NAD	NAD	NAD	1.24	8.98	2.23	0	Nr
49	3693868	A	Mild	A	A	A	A	A	A	A	A	90	150	90	20	98.4	24.4	Nr	NAD	NAD	NAD	NAD	1.12	11.60	4.82	0	Nr
50	3501811	A	-	A	A	A	A	P	P	P	A	54	140	80	20	99.1	27.3	Sl	NAD	NAD	NAD	NAD	0.38	4.08	66.20	600	Hypoth
51	2611435	A	Mild	A	A	A	A	A	P	A	A	90	140	80	21	97.8	28.6	Nr	NAD	NAD	NAD	NAD	0.54	3.10	3.98	0	Nr
52	3606309	A	Mod	A	A	A	A	A	A	A	A	79	140	90	22	99	24.1	Nr	NAD	NAD	NAD	NAD	0.54	4.82	4.78	0	Nr
53	4058327	A	-	A	A	A	A	A	A	A	A	98	120	80	18	98.9	26.8	Nr	NAD	NAD	NAD	NAD	1.92	3.12	4.98	0	Nr
54	3233211	A	-	A	A	A	A	A	A	A	A	80	130	80	16	98.7	26.6	Nr	NAD	NAD	NAD	NAD	1.23	12.60	4.86	0	Nr
55	849161	A	-	A	A	A	A	A	A	A	A	86	140	80	16	98.6	28.3	Nr	NAD	NAD	NAD	NAD	1.82	13.20	2.13	0	Nr
56	3727234	A	-	A	A	A	A	P	P	A	A	50	130	80	18	98.4	32.1	Sl	NAD	NAD	NAD	NAD	0.28	3.30	88.20	800	Hypoth
57	4021937	A	-	A	A	A	A	A	A	A	A	78	130	80	12	98.23	23.8	Nr	NAD	NAD	NAD	NAD	1.48	3.30	4.72	0	Nr
58	2765026	A	-	A	A	A	A	A	A	A	A	80	130	80	14	98.2	27.3	Nr	NAD	NAD	NAD	NAD	0.89	4.86	4.32	0	Nr
59	3765421	A	-	A	A	A	A	A	P	A	A	80	130	80	20	98.9	29.5	Nr	NAD	NAD	NAD	NAD	1.24	3.21	4.31	0	Nr
60	849242	A	-	A	A	A	A	A	A	A	A	64	130	80	21	99.2	27.64	Nr	NAD	NAD	NAD	NAD	0.82	3.48	4.11	0	Nr
61	4210810	A	Mild	A	A	A	A	A	A	A	A	70	130	80	18	99	20.5	Nr	NAD	NAD	NAD	NAD	1.42	11.20	0.86	0	Nr
62	4448789	A	-	A	A	A	A	A	A	A	A	72	130	80	18	98.4	24.8	Nr	NAD	NAD	NAD	NAD	1.48	8.62	3.86	0	Nr
63	4537588	A	Mild	A	A	A	A	P	A	A	A	82	120	80	18	98.5	32.9	Nr	NAD	NAD	NAD	NAD	1.42	7.86	3.26	0	Nr

ANNEXURE III - MASTER CHART

Serial number	In/Out patient number		General physical examination																Ankle jerk	Systemic examination				Investigations				Diagnosis
		yy										Vital signs																
													Blood pressure														
		Consanguinity	Pallor	Icterus	Lymphadenopathy	Cyanosis	Clubbing	Edema	Dry/coarse skin	Hoarseness	Goitre	Pulse (bpm)	Systolic (mmHg)	Diastolic (mmHg)	Respiratory rate	Temperature (^{0}F)	Body mass index (Kg/m^2)		Respiratory system	Cardiovascular system	Per abdomen	Central nervous system	T3 - ng/mL	T4 - µg/dL	TSH - mcIU/mL	TPO antibodies - IU/ml	
64	849133	A	-	A	A	A	A	A	A	A	A	65	130	80	20	96.4	20.61	Nr	NAD	NAD	NAD	NAD	1.28	6.62	13.98	400	Sub-Hypo
65	3465421	A	-	A	A	A	A	A	P	A	A	82	140	80	20	97.6	21.6	Nr	NAD	NAD	NAD	NAD	0.86	3.48	2.28	0	Nr
66	2240999	A	Mild	A	A	A	A	A	A	A	A	63	148	62	16	98.9	27.8	Nr	NAD	NAD	NAD	NAD	0.62	10.32	4.82	0	Nr
67	850441	A	-	A	A	A	A	A	A	A	A	70	142	78	15	99	25.1	Nr	NAD	NAD	NAD	NAD	0.76	11.82	0.86	0	Nr
68	4472489	A	-	A	A	A	A	A	P	A	A	62	162	82	17	98.2	30.8	Nr	NAD	NAD	NAD	NAD	0.53	5.40	75.00	335	Hypoth
69	3793862	A	Mild	A	A	A	A	A	P	P	A	68	138	68	14	98.4	25.1	Nr	NAD	NAD	NAD	NAD	1.42	11.28	0.82	0	Nr
70	871273	A	-	A	A	A	A	A	A	A	A	68	130	80	16	97.2	26.5	Nr	NAD	NAD	NAD	NAD	0.82	3.10	4.38	0	Nr
71	872091	A	-	A	A	A	A	A	P	A	A	82	128	86	18	98.5	23.8	Sl	NAD	NAD	NAD	NAD	1.12	5.82	23.98	403	Sub-Hypo
72	4735896	A	-	A	A	A	A	A	P	A	A	80	130	80	20	99.2	28.3	Nr	NAD	NAD	NAD	NAD	1.81	3.92	4.82	0	Nr
73	872774	A	-	A	A	A	A	A	P	P	A	54	138	76	18	98.8	25.3	Sl	NAD	NAD	NAD	NAD	0.81	4.28	84.54	843	Hypoth
74	870118	A	-	A	A	A	A	A	P	A	A	80	140	80	18	99.8	30.71	Nr	NAD	NAD	NAD	NAD	0.54	4.98	4.28	0	Nr
75	4280510	A	-	A	A	A	A	A	P	A	A	82	148	96	15	97.8	26.9	Nr	NAD	NAD	NAD	NAD	1.42	11.82	3.87	0	Nr
76	872529	A	-	A	A	A	A	A	A	P	A	86	138	76	16	98.6	29.7	Nr	NAD	NAD	NAD	NAD	1.48	3.02	0.98	0	Nr
77	2825030	A	-	A	A	A	A	A	P	P	A	52	152	98	15	98.9	21.3	Sl	NAD	NAD	NAD	NAD	0.63	4.82	54.30	103	Hypoth
78	849490	A	Mild	A	A	A	A	A	A	A	A	77	136	84	18	97.9	27.1	Nr	NAD	NAD	NAD	NAD	1.98	3.42	4.82	0	Nr
79	3605951	A	-	A	A	A	A	A	A	A	A	70	128	76	12	99.2	24.1	Sl	NAD	NAD	NAD	NAD	1.12	5.68	16.90	202	Sub-Hypo
80	873211	A	Mild	A	A	A	A	P	A	A	A	90	146	84	19	98.82	27.3	Nr	NAD	NAD	NAD	NAD	1.10	3.30	0.89	0	Nr
81	849931	A	-	A	A	A	A	A	A	A	A	66	148	78	17	98.6	25.7	Sl	NAD	NAD	NAD	NAD	1.08	7.23	15.50	253	Sub-Hypo
82	849822	A	-	A	A	A	A	A	A	A	A	80	138	72	20	98.5	22.3	Sl	NAD	NAD	NAD	NAD	0.78	3.38	46.80	524	Hypoth
83	850110	A	-	A	A	A	A	A	A	A	A	72	142	86	18	99	27.7	Sl	NAD	NAD	NAD	NAD	0.82	3.48	15.43	108	Sub-Hypo
84	774714	A	-	A	A	A	A	A	A	A	A	60	136	78	20	97.4	26.4	Nr	NAD	NAD	NAD	NAD	1.28	11.86	3.38	0	Nr

ANNEXURE III - MASTER CHART

Serial number	In/Out patient number	General physical examination																Ankle jerk	Systemic examination				Investigations				Diagnosis
		yy										Vital signs															
													Blood pressure														
		Consanguinity	Pallor	Icterus	Lymphadenopathy	Cyanosis	Clubbing	Edema	Dry/coarse skin	Hoarseness	Goitre	Pulse (bpm)	Systolic (mmHg)	Diastolic (mmHg)	Respiratory rate	Temperature (^{0}F)	Body mass index (Kg/m^2)		Respiratory system	Cardiovascular system	Per abdomen	Central nervous system	T3 - ng/mL	T4 - µg/dL	TSH - mcIU/mL	TPO antibodies - IU/ml	
85	1413737	A	Mild	A	A	A	A	A	A	A	A	88	142	86	20	98.2	25.31	Nr	NAD	NAD	NAD	NAD	1.82	12.62	4.78	0	Nr
86	873129	A	-	A	A	A	A	A	P	A	A	77	138	70	20	98.2	24	Nr	NAD	NAD	NAD	NAD	1.10	4.20	4.78	0	Nr
87	4280570	A	-	A	A	A	A	A	A	A	A	62	148	72	18	96.8	23.5	Nr	NAD	NAD	NAD	NAD	1.23	9.28	4.92	0	Nr
88	878809	A	-	A	A	A	A	A	A	A	A	78	138	78	18	97.8	27.8	Nr	NAD	NAD	NAD	NAD	1.48	11.76	4.82	0	Nr
89	848815	A	Mild	A	A	A	A	A	A	A	A	80	142	86	16	98.9	20	Nr	NAD	NAD	NAD	NAD	0.86	3.32	3.98	0	Nr
90	850971	A	-	A	A	A	A	A	A	A	A	80	136	90	18	97.8	21.3	Nr	NAD	NAD	NAD	NAD	1.48	7.78	2.28	0	Nr
91	850441	A	-	A	A	A	A	A	A	A	A	70	128	78	15	97.6	30	Nr	NAD	NAD	NAD	NAD	1.12	12.60	4.76	0	Nr
92	850110	A	-	A	A	A	A	A	A	A	A	92	138	90	12	97.6	24.8	Nr	NAD	NAD	NAD	NAD	1.42	11.28	3.80	0	Nr
93	870023	A	Mild	A	A	A	A	A	A	A	A	82	128	76	12	97.6	23.8	Nr	NAD	NAD	NAD	NAD	1.43	3.12	4.32	0	Nr
94	3928461	A	-	A	A	A	A	A	A	A	A	80	138	72	12	97.9	20.8	Nr	NAD	NAD	NAD	NAD	1.70	7.82	3.38	0	Nr
95	3418368	A	-	A	A	A	A	A	A	A	A	72	130	80	16	98.2	20.3	Nr	NAD	NAD	NAD	NAD	1.62	11.78	4.23	0	Nr
96	848109	A	Mild	A	A	A	A	A	A	A	A	60	132	72	15	99.2	24.8	Nr	NAD	NAD	NAD	NAD	1.03	2.82	4.32	0	Nr
97	746634	A	Mild	A	A	A	A	A	A	A	A	68	140	86	18	97.1	23	Nr	NAD	NAD	NAD	NAD	1.48	5.58	3.38	0	Nr
98	4231541	A	-	A	A	A	A	A	A	A	A	70	112	86	16	97.3	20.7	Nr	NAD	NAD	NAD	NAD	0.88	3.12	0.73	0	Nr
99	849837	A	Mild	A	A	A	A	A	A	A	A	80	138	76	17	98.4	25.1	Nr	NAD	NAD	NAD	NAD	0.98	11.91	1.10	0	Nr
100	3826461	A	-	A	A	A	A	A	P	P	A	50	146	72	18	98.4	26.6	Sl	NAD	NAD	NAD	NAD	0.80	4.28	54.43	208	Hypoth

Serial number	In/Out patient number	Age (Years)	Age (Years)	Sex	Occupation	Chief complaints											
						Easy Fatiguability	Generalised weakness	Lethargy / Dysinterest in daily activities	Anorexia	Swelling of limbs/face	Weight gain	Constipation	Heat intolerance	Sweating	Palpitations	Weight loss	Increased appetite	Diarrhoea
1		81	81 to 85	F	Hw	P	P	P	A	A	A	A	A	A	A	A	A	A
2		71	71 to 75	F	Fm	P	P	P	A	A	P	A	A	A	A	A	A	A
3		62	60 to 65	F	Teacher	P	P	P	P	P	A	A	A	A	A	A	A	A
4		63	60 to 65	F	Hw	P	P	P	P	A	A	A	A	A	A	A	A	A
5		85	81 to 85	F	Hw	P	P	P	A	P	A	P	A	A	A	P	A	A
6		64	60 to 65	F	Tailor	P	P	P	A	A	P	A	A	A	A	A	A	A
7		62	60 to 65	F	Fm	P	P	P	A	A	A	A	P	P	A	P	A	A
8		67	66 to 70	F	Fm	P	P	P	A	A	A	A	A	P	P	A	A	A
9		83	81 to 85	M	Sr	A	A	A	A	A	A	A	A	A	P	A	A	A
10		72	71 to 75	F	Fm	A	A	A	A	A	A	A	P	P	P	P	P	A
11		82	81 to 85	F	Vendor	A	A	A	A	A	A	A	A	A	A	A	P	A
12		64	60 to 65	F	Sr	P	P	A	A	A	P	A	A	A	A	A	A	A
13		73	71 to 75	F	Hw	P	P	P	A	P	A	A	A	P	A	A	A	A
14		68	66 to 70	M	Sr	A	A	A	P	A	A	P	A	P	P	P	A	A
15		62	60 to 65	F	Sr	P	P	P	P	P	P	A	A	A	A	A	A	A
16		66	66 to 70	F	Fm	P	P	P	A	A	A	A	A	A	A	A	A	A
17		72	71 to 75	F	Tailor	P	P	A	A	A	P	A	A	A	A	A	A	A
18		64	60 to 65	F	Sr	P	P	P	A	A	A	P	A	P	A	A	A	A
19		79	76 to 80	F	Sk	P	P	P	A	A	A	A	A	A	A	A	A	A
20		80	76 to 80	F	Teacher	P	P	P	P	A	A	P	A	A	A	A	A	A
21		78	76 to 80	M	Sk	P	P	P	A	A	P	P	A	A	A	A	A	A
22		73	71 to 75	F	Sr	A	A	A	A	A	A	A	P	P	P	P	P	A
23		61	60 to 65	F	Sr	P	P	P	A	A	A	A	A	P	A	A	A	A
24		78	76 to 80	F	Fm	A	A	A	A	A	A	A	A	P	A	A	A	A
25		60	60 to 65	F	Sr	P	P	P	A	A	A	A	A	A	A	A	A	A
26		76	76 to 80	F	Hw	P	P	P	A	A	A	A	A	A	A	A	A	A
27		62	60 to 65	F	Sr	P	P	P	P	A	A	P	A	A	A	A	A	A
28		65	60 to 65	F	Hw	P	P	A	A	P	P	A	A	A	A	A	A	A
29		63	60 to 65	M	Sr	P	P	A	A	A	A	A	P	A	P	A	A	A
30		62	60 to 65	F	Hw	P	A	A	A	A	A	A	A	A	A	A	P	A
31		63	60 to 65	F	Hw	P	P	P	A	A	A	A	A	A	A	A	A	A
32		64	60 to 65	F	Fm	P	P	A	A	A	A	A	A	A	A	A	A	A

33		64	60 to 65	F	Fm	P	P	P	P	A	A	A	A	A	A	A	A	A
34		60	60 to 65	F	Teacher	P	P	P	P	P	A	A	A	A	A	A	A	A
35		78	76 to 80	F	Fm	P	P	P	P	A	A	A	A	A	A	A	A	A
36		87	86 to 87	F	Teacher	P	P	P	A	A	A	A	A	A	A	A	A	A
37		63	60 to 65	F	Fm	P	P	A	P	P	A	A	A	A	A	A	A	A
38		62	60 to 65	F	Pr	P	P	P	A	P	A	A	A	A	A	A	A	A
39		60	60 to 65	M	Fm	P	P	P	A	A	A	A	A	A	P	A	P	A
40		63	60 to 65	F	Tailor	P	P	A	A	A	A	A	A	A	A	P	P	P
41		66	66 to 70	F	Vendor	P	P	P	A	A	A	A	A	A	A	A	A	A
42		65	60 to 65	F	Teacher	P	P	P	P	P	P	P	A	A	A	A	A	A
43		73	71 to 75	F	Fm	P	P	A	A	A	A	P	A	A	P	A	A	A
44		63	60 to 65	F	Hw	P	P	P	P	P	P	P	A	A	A	A	A	A
45		68	66 to 70	M	Sr	P	P	P	P	A	A	A	A	A	A	A	P	A
46		77	76 to 80	M	Sr	P	P	A	A	A	A	P	A	A	A	A	P	A
47		80	76 to 80	M	Sr	P	P	A	A	A	A	A	P	A	A	A	P	A
48		61	60 to 65	M	Pr	P	P	A	A	A	A	A	A	A	P	A	A	A
49		62	60 to 65	M	Pr	P	P	P	P	A	A	A	A	A	A	A	P	A
50		64	60 to 65	F	Pr	P	P	P	P	P	P	P	A	A	A	A	A	A
51		63	60 to 65	F	Sr	P	P	P	P	A	A	A	A	A	A	A	A	A
52		70	66 to 70	F	Hw	P	P	P	A	P	P	A	A	A	A	A	A	A
53		65	60 to 65	F	Sr	P	P	P	A	A	A	A	A	A	A	P	A	A
54		77	76 to 80	F	Fm	P	P	P	A	A	A	A	P	A	A	A	A	A
55		71	71 to 75	M	Sr	P	P	A	A	A	P	A	P	A	A	A	P	A
56		61	60 to 65	F	Pr	P	P	P	P	P	A	A	A	A	A	A	A	A
57		74	71 to 75	M	Fm	P	P	A	A	A	A	A	A	P	A	P	A	A
58		63	60 to 65	M	Watchman	P	P	P	A	A	A	A	P	A	A	A	A	A
59		63	60 to 65	M	Sr	P	P	A	P	A	A	A	A	A	A	P	A	A
60		64	60 to 65	M	Pr	P	P	A	P	A	A	P	P	A	A	A	A	A
61		63	60 to 65	F	Hw	P	P	A	A	A	A	A	A	A	A	P	A	A
62		80	76 to 80	M	Fm	P	P	A	P	A	A	P	A	A	A	A	A	A
63		60	60 to 65	F	Tailor	P	P	P	P	A	A	A	A	A	P	A	A	A
64		71	71 to 75	M	Vendor	P	P	A	A	P	A	P	A	A	A	A	A	A
65		70	66 to 70	M	Sr	P	P	P	A	A	P	A	P	A	A	A	A	A
66		82	81 to 85	M	Fm	P	P	P	A	A	A	A	A	P	A	A	P	A
67		83	81 to 85	M	Sr	P	P	P	P	A	A	P	A	A	A	A	A	A
68		64	60 to 65	F	Teacher	P	P	P	P	A	A	P	A	A	P	A	A	A
69		60	60 to 65	M	Sk	P	P	A	A	A	A	A	A	A	A	P	P	A
70		71	71 to 75	F	Fm	P	P	P	P	A	A	A	A	A	A	A	A	A
71		64	60 to 65	F	Vendor	P	P	A	A	P	A	P	A	A	A	A	A	A
72		74	71 to 75	F	Hw	P	P	P	A	A	A	A	A	A	A	A	P	A
73		62	60 to 65	F	Sr	P	P	P	P	A	P	A	A	A	A	A	A	A
74		61	60 to 65	F	Vendor	P	P	P	A	P	A	A	A	A	A	A	A	A
75		62	60 to 65	M	Sr	P	P	A	P	A	A	P	A	A	A	A	A	A
76		71	71 to 75	F	Fm	P	P	P	A	A	A	A	A	P	A	A	A	A
77		61	60 to 65	M	Sr	P	P	P	A	P	P	A	A	A	A	A	A	A
78		65	60 to 65	M	Fm	P	P	P	A	A	P	A	A	P	A	A	A	A
79		67	66 to 70	M	Fm	P	P	A	A	A	P	A	A	A	A	A	A	A
80		82	81 to 85	F	Fm	P	P	P	A	A	A	A	A	P	A	A	A	A
81		68	66 to 70	F	Fm	P	P	A	P	A	A	P	A	A	A	A	A	A
82		63	60 to 65	F	Hw	P	P	A	A	P	A	A	A	A	A	A	A	A
83		77	76 to 80	M	Sr	P	P	A	P	A	P	A	A	A	A	A	A	A
84		64	60 to 65	M	Hw	P	P	P	A	A	P	A	A	A	A	A	A	A

85	61	60 to 65	M	Sr	P	P	P	A	A	A	A	A	A	A	P	A	A
86	67	66 to 70	F	Hw	P	P	P	P	A	A	A	A	A	A	A	A	A
87	64	60 to 65	M	Fm	P	P	A	A	A	A	A	A	A	A	P	A	A
88	61	60 to 65	M	Sr	P	P	P	A	A	A	A	A	A	P	A	A	A
89	63	60 to 65	F	Fm	P	P	P	A	A	A	A	A	A	A	A	A	A
90	62	60 to 65	F	Hw	P	P	A	P	A	A	A	A	A	A	A	A	A
91	62	60 to 65	F	Fm	P	P	P	P	A	A	A	A	A	A	A	A	A
92	69	66 to 70	F	Fm	P	P	A	P	A	A	A	A	A	A	A	A	A
93	62	60 to 65	F	Fm	P	P	A	P	A	A	A	A	A	A	A	A	A
94	62	60 to 65	F	Hw	P	P	P	P	A	A	A	A	A	P	A	A	A
95	61	60 to 65	M	Sr	P	P	A	P	A	A	A	A	A	A	A	A	A
96	68	66 to 70	F	Fm	P	P	A	P	P	A	A	A	A	A	A	A	A
97	61	60 to 65	F	Hw	P	P	A	A	A	A	A	P	A	A	A	A	A
98	61	60 to 65	M	Fm	P	P	A	P	A	A	A	A	A	A	A	A	A
99	76	76 to 80	F	Tailor	P	P	P	P	A	A	A	A	A	A	A	A	A
##	62	60 to 65	M	Sr	P	P	P	A	A	P	P	A	A	A	A	A	A

		History						
		Past history		Personal history		Treatment history		
Tremors	Swelling in Neck	Similar complaints	Treatment for same	Diet history	Habits	Associated diseases	Operative procedure	Drugs history
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	For 2yrs	Iron Suppli	Non- veg	Tobacco	Hypertension	Nil	Anti-hypertensive
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	Hypertension	Nil	Anti-hypertensive
A	A	Nil	Nil	Non- veg	Smoking	Hypertension	Nil	Anti-hypertensive
A	A	Nil	Nil	Veg	Nil	DM	Nil	Anti-Diabetic
A	A	3yrs back	B plex	Veg	Nil	Nil	Nil	Nil
P	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Tobacco	Nil	Nil	Nil
P	A	Nil	Nil	Non- veg	Nil	DM, HTN	Nil	Anti-DM, Anti-HTN
A	A	Nil	Nil	Non- veg	Tobacco	DM, HTN	Nil	Anti-DM, Anti-HTN
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	3yrs back	B plex	Non- veg	Nil	HTN	Nil	Anti-hypertensive
A	A	1yrs back	Iron and multi vit	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	4yrs back	Iron Suppli	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	DM	Nil	Anti-Diabetic
A	A	Nil	Nil	Veg	Nil	IHD	Nil	IHD Med
P	A	5yrs back	blood, multivit	Veg	Nil	Haemorrhoids	Haemorrhoidectomy	Nil
P	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	4yrs back	Iron Suppli	Non- veg	Nil	Nil	Nil	Nil
P	A	Nil	nil	Veg	Nil	DM, HTN	Nil	Anti-DM, Anti-HTN
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	Asthama	Nil	bronchodilator
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
P	A	5yrs back	Multivit	Veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	IHD	Nil	Anti-IHD
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	DM	Nil	Anti-DM
A	A	Nil	Nil	Non- veg	Nil	Bronchitis	Nil	Inhaler

A	A	2yrs back	Multivit	Non- veg	Nil	DM, HTN	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	HTN	Nil	Nil
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	Asthama	Nil	bronchodilator
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Anti-hypertensive
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	5yrs back	Iron and multi vit	Non- veg	Nil	DM	Nil	Anti-DM
A	A	2yrs back	Multivit	Non- veg	Nil	IHD	Nil	Anti-IHD
A	A	Nil	Nil	Non- veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Non- veg	Nil	DM	Nil	Anti-DM
A	A	Nil	Nil	veg	Nil	Asthama	Nil	Inhaler
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	DM	Nil	Anti-DM
P	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	TVD	Nil	CABG
A	A	4yrs back	Multivit	Non- veg	Nil	HTN	Nil	Anti-hypertensive
P	A	Nil	Nil	Veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
P	A	Nil	Nil	Non- veg	Nil	DM	Nil	Anti-DM
P	A	5yrs back	Multivit	Veg	Nil	Pulmonary TB	Nil	AKT
A	A	Nil	Nil	Non- veg	Nil	DM	Nil	Anti-DM
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	IHD	Nil	Anti-IHD
P	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	IHD	Nil	PTCA, Stent
P	A	Nil	Nil	Non- veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
P	A	2yrs back	Multivit	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	DM	Nil	Anti-DM
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	1yrs back	Iron and multi vit	Non- veg	Nil	IHD	Nil	PTCA, Stent
A	A	Nil	Nil	Veg	Nil	IHD	Nil	Anti-IHD
A	A	Nil	Nil	Non- veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Non- veg	Nil	DM	Nil	Anti-DM
A	A	Nil	Nil	Veg	Nil	IHD	Nil	PTCA, Stent
A	A	Nil	Nil	Non- veg	Nil	HTN	Nil	Anti-hypertensive
A	A	5yrs back	Iron and multi vit	Non- veg	Nil	Nil	Nil	Nil
P	A	Nil	Nil	Non- veg	Nil	Pulmonary TB	Nil	AKT
A	A	Nil	Nil	Veg	Nil	DM, HTN	Nil	Anti- HTN, Anti DM
A	A	Nil	Nil	Non- veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
P	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Veg	Nil	IHD	Nil	PTCA, Stent
A	A	Nil	Nil	Non- veg	Nil	DM	Nil	Anti-DM

A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	IHD	Nil	Anti-IHD
P	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	DM	Nil	Anti-DM
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	IHD, HTN	Nil	Anti-HTN, PTCA
A	A	2yrs back	Iron and multi vit	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil
A	A	2yrs back	Multivit	Veg	Nil	HTN	Nil	Anti-hypertensive
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Non- veg	Nil	Nil	Nil	Nil
A	A	Nil	Nil	Veg	Nil	Nil	Nil	Nil

			General physical examination												
Family history												Vital signs			
													BP (mmHg)		
Thyroid disorder in any member	Genetic disorders	Consanguinity	Pallor	Icterus	Lymphadenopathy	Cyanosis	Clubbing	Edema	Dry/coarse skin	Hoarseness	Goitre	Pulse (bpm)	Systolic	Diastolic	Respiratory rate
Hypothyroidism in sister	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	130	70	18
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	62	140	80	20
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Ankle edema	Nil	Nil	Nil	70	130	80	20
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	150	90	18
Nil	Nil	Nil	Moderate	Nil	Nil	Nil	Nil	Ankle edema	Nil	Nil	Nil	60	150	80	21
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	72	120	80	16
Hypothyroidism in Father	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	80	150	90	14
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	90	140	90	18
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	101	140	80	22
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	110	160	90	20
Hyperthyroidism in Father	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	90	140	90	20
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	95	138	86	16
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	160	90	18
Hyperthyroidism in Father	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	101	144	78	20
Hypothyroidism in sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Knee	P	Nil	Nil	65	138	70	22
Hyperthyroidism in sister	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	100	130	80	20
Nil	Nil	Nil	Moderate	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	60	130	80	13
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	72	140	90	20
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	90	120	80	14
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	150	90	20
Hypothyroidism in sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Ankle edema	P	P	Nil	100	140	80	16
Hypothyroidism in brother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	110	130	80	18
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	98	130	80	20
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	140	80	20
Hypothyroidism in sister	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	90	130	80	18
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	98	150	90	18
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	50	130	80	18
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	62	140	80	17
Hypothyroidism in sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	66	130	80	21
Hyperthyroidism in sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	130	80	20
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	60	130	80	12
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	58	140	80	20

Hypothyroidism is sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	70	140	90	14
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	P	Nil	48	130	80	17
Hypothyroidism in mother	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	82	140	90	14
Hyperthyroidism in Father	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	78	130	80	20
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	140	80	15
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	66	150	80	17
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	98	140	80	14
Hypothyroidism in brother	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	90	130	80	20
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	140	90	13
Hypothyroidism in grandmother	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	48	150	100	21
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	99	150	80	15
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Knee	P	P	A	58	130	80	18
Hypothyroidism in brother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	78	140	80	22
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	80	120	80	15
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	66	140	90	12
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	99	140	80	20
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	90	150	90	20
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Ankle edema	P	P	Nil	54	140	80	20
Hyperthyroidism in brother	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	90	140	80	21
Nil	Nil	Nil	Moderate	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	79	140	90	22
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	98	120	80	18
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	130	80	16
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	86	140	80	16
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Ankle edema	P	Nil	Nil	50	130	80	18
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	78	130	80	12
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	130	80	14
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	80	130	80	20
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	64	130	80	21
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	70	130	80	18
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	72	130	80	18
Hypothyroidism in mother	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Ankle edema	Nil	Nil	Nil	82	120	80	18
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	65	130	80	20
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	82	140	80	20
Hyperthyroidism in Father	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	63	148	62	16
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	70	142	78	15
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	62	162	82	17
Hypothyroidism in mother	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	P	P	Nil	68	138	68	14
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	68	130	80	16
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	82	128	86	18
Hypothyroidism in sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	80	130	80	20
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	P	Nil	54	138	76	18
Hypothyroidism in sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	80	140	80	18
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	82	148	96	15
Hyperthyroidism in brother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	86	138	76	16
Hypothyroidism in sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	P	A	52	152	98	15
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	77	136	84	18
Hypothyroidism in brother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	70	128	76	12
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Ankle edema	Nil	Nil	Nil	90	146	84	19
Hypothyroidism in brother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	66	148	78	17
Hypothyroidism in mother	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	138	72	20
Hypothyroidism in sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	72	142	86	18
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	60	136	78	20

Hypothyroidism in sister	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	88	142	86	20
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	Nil	Nil	77	138	70	20
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	62	148	72	18
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	78	138	78	18
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	142	86	16
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	136	90	18
Hypothyroidism in Father	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	70	128	78	15
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	92	138	90	12
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	82	128	76	12
Hyperthyroidism in Father	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	138	72	12
Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	72	130	80	16
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	60	132	72	15
Nil	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	68	140	86	18
Hypothyroidism in sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	70	112	86	16
Hyperthyroidism in sister	Nil	Nil	Mild	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	80	138	76	17
Hypothyroidism in sister	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	P	P	Nil	50	146	72	18

			Systemic examination				Investigations				
Temperature (^{0}F)	BMI - kg/m2	Ankle jerk	Respiratory system	Cardiovascular system	Per abdomen	Central nervous system	T3 - ng/ml	T4 - µg/dl	TSH - mcIU/ml	TPO antibodies - IU/ml	Diagnosis
98.2	20	Normal	NAD	NAD	NAD	NAD	0.76	4.21	1.03	2	Normal
97.4	28.1	Normal	NAD	NAD	NAD	NAD	0.8	9.2	12.02	400	Sub- Hypo
98.2	28.1	Sluggish	NAD	NAD	NAD	NAD	1.2	4.4	14.01	200	Sub- Hypo
98.7	22.9	Normal	NAD	NAD	NAD	NAD	1.2	5.2	2.2	0	Normal
97.7	17.7	Normal	NAD	NAD	NAD	NAD	1	6	2.3	4	Normal
98.3	29.6	Normal	NAD	NAD	NAD	NAD	1.3	5.6	2.2	0	Normal
99	21.4	Normal	NAD	NAD	NAD	NAD	1.1	7.2	3.78	0	Normal
98.1	22.7	Hyper	NAD	NAD	NAD	NAD	0.8	7.2	4.2	0	Normal
99.2	27.6	Normal	NAD	NAD	NAD	NAD	4.92	14.8	0.01	0	Sub-Hyper
99.1	17.9	Hyper	NAD	NAD	NAD	NAD	6.2	25.8	0.01	0	Hyper
97.6	24.4	Hyper	NAD	NAD	NAD	NAD	2.68	14.98	0.03	0	Sub-Hyper
98.2	32.3	Normal	NAD	NAD	NAD	NAD	1.22	11.6	3.82	0	Normal
98.2	24.3	Normal	NAD	NAD	NAD	NAD	0.8	3.6	0.56	0	Normal
98.9	19.5	Normal	NAD	NAD	NAD	NAD	1.1	11.6	0.86	0	Normal
97.6	23.5	sluggish	NAD	NAD	NAD	NAD	1.2	3.8	48.6	500	Hypo
98.2	25.9	Normal	NAD	NAD	NAD	NAD	1.2	11.6	4.28	5	Normal
99	34.1	Normal	NAD	NAD	NAD	NAD	1.2	10.6	0.58	30	Normal
99.1	23.8	Normal	NAD	NAD	NAD	NAD	0.98	10.8	0.65	25	Normal
98.6	25.39	Normal	NAD	NAD	NAD	NAD	1.2	8.9	0.98	25	Normal
98.2	26.1	Normal	NAD	NAD	NAD	NAD	1.29	8.6	3.78	29	Normal
98.7	33.5	Sluggish	NAD	NAD	NAD	NAD	5.28	1.16	14.8	500	sub-hypo
99.1	20.3	Normal	NAD	NAD	NAD	NAD	1.46	9.45	0.39	0	hyper
98.4	22.8	Normal	NAD	NAD	NAD	NAD	1.28	11.28	4.08	0	Normal
98.3	25.3	Hyper	NAD	NAD	NAD	NAD	1.98	12.1	0.01	0	sub-hyper
98.2	23.6	Normal	NAD	NAD	NAD	NAD	1.2	8.6	3.86	0	Normal
99	21.3	Normal	NAD	NAD	NAD	NAD	1.43	11.8	0.98	0	Normal
99	20.94	Sluggish	NAD	NAD	NAD	NAD	0.23	2.2	85	800	Hypo
98.4	28.8	Normal	NAD	NAD	NAD	NAD	1.58	6.82	15.9	400	sub-hypo
97.8	21	Normal	NAD	NAD	NAD	NAD	1.2	5.4	0.87	0	Normal
97.6	24.3	Normal	NAD	NAD	NAD	NAD	3.6	14.6	0.32	0	sub-hyper
98.3	22	Normal	NAD	NAD	NAD	NAD	1.48	11.2	0.89	0	Normal
99	25.5	Normal	NAD	NAD	NAD	NAD	0.98	4.8	0.88	0	Normal

96.5	28	Normal	NAD	NAD	NAD	NAD	1.2	12.8	0.99	0	Normal
98.2	25.9	Normal	NAD	NAD	NAD	NAD	0.53	2.3	75.2	900	Hypo
98.6	23.6	Normal	NAD	NAD	NAD	NAD	0.99	3.86	0.89	0	Normal
98.4	23.57	Normal	NAD	NAD	NAD	NAD	1.68	10.98	0.86	0	Normal
97.2	21.82	Normal	NAD	NAD	NAD	NAD	1.12	9.86	0.86	0	Normal
97.8	23.8	Sluggish	NAD	NAD	NAD	NAD	1.42	6.68	18.98	600	sub-hypo
96.8	31.25	Normal	NAD	NAD	NAD	NAD	1.48	11.98	0.8	0	Normal
98.8	20.67	Normal	NAD	NAD	NAD	NAD	1.2	10.68	4.78	0	Normal
99	25.9	Normal	NAD	NAD	NAD	NAD	1.82	12.8	3.36	0	Normal
98.3	26.7	Sluggish	NAD	NAD	NAD	NAD	0.54	3.1	86.3	98	Hypo
98.6	31.25	Normal	NAD	NAD	NAD	NAD	1.16	7.43	4.3	0	Normal
98.1	24.4	Sluggish	NAD	NAD	NAD	NAD	0.98	5.54	86.2	300	Hypo
99	31.67	Normal	NAD	NAD	NAD	NAD	0.88	5.39	4.28	0	Normal
99	27.7	Normal	NAD	NAD	NAD	NAD	1.1	8.68	4.23	0	Normal
98.7	25	Normal	NAD	NAD	NAD	NAD	1.8	12.6	4.78	0	Normal
98.6	32	Normal	NAD	NAD	NAD	NAD	1.24	8.98	2.23	0	Normal
98.4	24.4	Normal	NAD	NAD	NAD	NAD	1.12	11.6	4.82	0	Normal
99.1	27.3	Sluggish	NAD	NAD	NAD	NAD	0.38	4.08	66.2	600	Hypo
97.8	28.6	Normal	NAD	NAD	NAD	NAD	0.54	3.1	3.98	0	Normal
99	24.1	Normal	NAD	NAD	NAD	NAD	0.54	4.82	4.78	0	Normal
98.9	26.8	Normal	NAD	NAD	NAD	NAD	1.92	3.12	4.98	0	Normal
98.7	26.6	Normal	NAD	NAD	NAD	NAD	1.23	12.6	4.86	0	Normal
98.6	28.3	Normal	NAD	NAD	NAD	NAD	1.82	13.2	2.13	0	Normal
98.4	32.1	Sluggish	NAD	NAD	NAD	NAD	0.28	3.3	88.2	800	Hypo
98.2	23.8	Normal	NAD	NAD	NAD	NAD	1.48	3.3	4.72	0	Normal
98.2	27.3	Normal	NAD	NAD	NAD	NAD	0.89	4.86	4.32	0	Normal
98.9	29.5	Normal	NAD	NAD	NAD	NAD	1.24	3.21	4.31	0	Normal
99.2	27.64	Normal	NAD	NAD	NAD	NAD	0.82	3.48	4.11	0	Normal
99	20.5	Normal	NAD	NAD	NAD	NAD	1.42	11.2	0.86	0	Normal
98.4	24.8	Normal	NAD	NAD	NAD	NAD	1.48	8.62	3.86	0	Normal
98.5	32.9	Normal	NAD	NAD	NAD	NAD	1.42	7.86	3.26	0	Normal
96.4	20.61	Normal	NAD	NAD	NAD	NAD	1.28	6.62	13.98	400	Sub-hypo
97.6	21.6	Normal	NAD	NAD	NAD	NAD	0.86	3.48	2.28	0	Normal
98.9	27.8	Normal	NAD	NAD	NAD	NAD	0.62	10.32	4.82	0	Normal
99	25.1	Normal	NAD	NAD	NAD	NAD	0.76	11.82	0.86	0	Normal
98.2	30.8	Normal	NAD	NAD	NAD	NAD	0.53	5.4	75	335	Hypo
98.4	25.1	Normal	NAD	NAD	NAD	NAD	1.42	11.28	0.82	0	Normal
97.2	26.5	Normal	NAD	NAD	NAD	NAD	0.82	3.1	4.38	0	Normal
98.5	23.8	Sluggish	NAD	NAD	NAD	NAD	1.12	5.82	23.98	403	Sub-Hypo
99.2	28.3	Normal	NAD	NAD	NAD	NAD	1.81	3.92	4.82	0	Normal
98.8	25.3	Sluggish	NAD	NAD	NAD	NAD	0.81	4.28	84.54	843	Hypo
99.8	30.71	Normal	NAD	NAD	NAD	NAD	0.54	4.98	4.28	0	Normal
97.8	26.9	Normal	NAD	NAD	NAD	NAD	1.42	11.82	3.87	0	Normal
98.6	29.7	Normal	NAD	NAD	NAD	NAD	1.48	3.02	0.98	0	Normal
98.9	21.3	Sluggish	NAD	NAD	NAD	NAD	0.63	4.82	54.3	103	Hypo
97.9	27.1	Normal	NAD	NAD	NAD	NAD	1.98	3.42	4.82	0	Normal
99.2	24.1	Sluggish	NAD	NAD	NAD	NAD	1.12	5.68	16.9	202	sub-hypo
98.8	27.3	Normal	NAD	NAD	NAD	NAD	1.1	3.3	0.89	0	Normal
98.6	25.7	Sluggish	NAD	NAD	NAD	NAD	1.08	7.23	15.5	253	Sub-hypo
98.5	22.3	Sluggish	NAD	NAD	NAD	NAD	0.78	3.38	46.8	524	Hypo
99	27.7	Sluggish	NAD	NAD	NAD	NAD	0.82	3.48	15.43	108	Sub-hypo
97.4	26.4	Normal	NAD	NAD	NAD	NAD	1.28	11.86	3.38	0	Normal

98.2	25.31	Normal	NAD	NAD	NAD	NAD	1.82	12.62	4.78	0	Normal
98.2	24	Normal	NAD	NAD	NAD	NAD	1.1	4.2	4.78	0	Normal
96.8	23.5	Normal	NAD	NAD	NAD	NAD	1.23	9.28	4.92	0	Normal
97.8	27.8	Normal	NAD	NAD	NAD	NAD	1.48	11.76	4.82	0	Normal
98.9	20	Normal	NAD	NAD	NAD	NAD	0.86	3.32	3.98	0	Normal
97.8	21.3	Normal	NAD	NAD	NAD	NAD	1.48	7.78	2.28	0	Normal
97.6	30	Normal	NAD	NAD	NAD	NAD	1.12	12.6	4.76	0	Normal
97.6	24.8	Normal	NAD	NAD	NAD	NAD	1.42	11.28	3.8	0	Normal
97.6	23.8	Normal	NAD	NAD	NAD	NAD	1.43	3.12	4.32	0	Normal
97.9	20.8	Normal	NAD	NAD	NAD	NAD	1.7	7.82	3.38	0	Normal
98.2	20.3	Normal	NAD	NAD	NAD	NAD	1.62	11.78	4.23	0	Normal
99.2	24.8	Normal	NAD	NAD	NAD	NAD	1.03	2.82	4.32	0	Normal
97.1	23	Normal	NAD	NAD	NAD	NAD	1.48	5.58	3.38	0	Normal
97.3	20.7	Normal	NAD	NAD	NAD	NAD	0.88	3.12	0.73	0	Normal
98.4	25.1	Normal	NAD	NAD	NAD	NAD	0.98	11.91	1.1	0	Normal
98.4	26.6	Sluggish	NAD	NAD	NAD	NAD	0.8	4.28	54.43	208	Hypo

Age (Years)
Sex
Occupation
Easy Fatiguability
Generalised weakness
Lethargy / Dysinterest in daily activities
Anorexia
Swelling of limbs/face
Weight gain
Constipation
Heat intolerance
Sweating
Palpitations
Weight loss
Increased appetite
Diarrhoea
Tremors
Swelling in Neck
Similar con Past history
Treatment for same
Diet history Personal history
Habits
Associated Treatment history
Operative procedure
Drugs history
Thyroid dis Family history
Genetic disorders
Consanguinity
Pallor
Icterus
Lymphadenopathy
Cyanosis
Clubbing
Edema
Dry/coarse skin
Hoarseness
Goitre
Pulse (bpm Vital signs
Systolic BP (mmHg)
Diastolic
Respiratory rate
Temperature (0F)
BMI - kg/m2
Ankle jerk
Respiratory system
Cardiovascular system
Per abdomen
Central nervous system
T3 - ng/ml
T4 - µg/dl
TSH - mcIU/ml

TPO antibodies - IU/ml
Thyroid abnormality
Diagnosis