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ASSESSMENT OF PREVALANCE, ETIOLOGY AND RISK FACTORS OF HYPOTHYROIDISM AND ITS IMPACT ON QUALITY OF LIFE OF PATIENTS

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ABSTRACT

The thyroid gland is important in the metabolism of the body by secretion of thyroid hormones (T3 and T4), working in collaboration with the nervous and immune system. Hypothyroidism is a widespread endocrine condition that is marked with lack of thyroid hormones. It can be caused by endogenous factors, especially by the autoimmune destruction as is the case with Hashimoto thyroiditis, or exogenous factors, like iodine deficiency. Epidemiology reports that, women are more likely to suffer hypothyroidism which has a risk of 4-10 times more than that of men with its common occurrence observed between 30-60 years. The incidence rises with the age of more than 65 years of age, namely, in one out of 10 women and 6 men. Almost 95% of the cases that are diagnosed are primary hypothyroidism. The increased detection rates are due to the improved screening, the change in the nutritional intake of iodine, and the auto immune etiologies. Besides physical signs that include cold intolerance, puffiness, reduced sweating, and skin alterations, hypothyroidism is correlated with

psychological problems, especially with depression which has a significant effect on the quality of life of patients. The purpose of this review is to determine the prevalence, risk factors, and etiology of hypothyroidism and to determine its effect on health-related quality of life.

Keywords: Hypothyroidism, Thyroid hormones [T3 & T4], Epidemiology, Clinical features, Quality of life

INTRODUCTION:

Thyroid gland is a butterfly shaped gland which is present in front of the neck. It produces T3 & T4 upon stimulation by the TSH [Thyroid Stimulating Hormone]. abnormal levels of T3, T4 & TSH hormones will leads to hypothyroidism and hyperthyroidism. Hypothyroidism is one of the most common endocrine disorder worldwide. Hypothyroidism occurs when the thyroid gland does not produce enough thyroid hormone [T3 & T4] for the body's requirement [1].

When hypothyroidism is not treated or under treated or under diagnosed or over diagnosed may leads to cardiac issues, dyslipidaemia, cognitive impairment and neuromuscular dysfunction [2].

Hypothyroidism is classified or categorized based on part of the HYPOTHALAMIC-PITUTARY-THYROID-AXIS is affected. It is of primary hypothyroidism; thyroid gland dysfunction will result in decreased T3 & T4 even there is an increase in TSH [3].

Central hypothyroidism which includes both secondary and tertiary hypothyroidism. pituitary gland dysfunction leads to secondary hypothyroidism due to decreased

TSH production. Tertiary hypothyroidism occurs as a result of inability of hypothalamus to produce sufficient TRH [Thyrotropin releasing hormone][4].

Other types include (a) congenital hypothyroidism, its and inborn disorder [5].

(b) sub clinical hypothyroidism which is also called mild thyroid failure, even though TSH levels are slightly elevated T3& T4 will be normal [6]. (c) postpartum thyroiditis [occurs after child birth] it is characterized but short period of hyperthyroidism followed by hypothyroidism which remains permanent [7]

Hypothyroidism can be due to both endogenous and exogenous reasons. The endogenous cause is due to autoimmune destruction of thyroid gland [Eg: Hashimoto's disease - chronic lymphocytic thyroiditis]. The exogenous cause is due to low intake of iodine [iodine deficient condition]. Sufficient iodine levels are required for production of T3 and T4. So when the iodine is in deficient condition it will lead to hypothyroidism [8].

Hypothyroidism causes both physiological and psychological abnormalities which impacts on quality of life of hypothyroid

patient. Auto immune thyroiditis (Hashimotos disease) has been becoming most frequent cause in the areas with the sufficient iodine. other causes for the hypothyroidism include thyroidectomy, genetical, postpartum thyroiditis, medication induced, radioactive iodine treatment, gestational and congenital thyroid dysgenesis [9].

Recent research has shown that people with hypothyroidism typically have lower health related quality of life compared to general population [10].

Depression is one of the most common psychiatric characteristics associated with hypothyroidism in elderly [11].

In addition, some patients with hypothyroidism experience a goitre related enlargement of the front neck [12].

If hypothyroidism during pregnancy is not treated it may lead to congenital iodine deficiency syndrome and also other birth

defects can occur [13].

2% to 4% of women among reproductive age are more likely to have hypothyroidism [14]

Health risk that has been reported to be associated with sub optimal treatment for hypothyroidism may include cardio vascular diseases, obesity, depression, pulmonary consequences and fertility problems [15].

The symptoms of hypothyroidism include mild to moderate weight gain, fatigue, depression, menstrual irregularities, poor concentration etc. The symptoms are non-specific. The consequence of under-treated (or) untreated hypothyroidism leads to cardiovascular disease & increased chances of mortality [16].

The comorbidities such as CHF, pericarditis, intestinal obstruction, pleural effusion & coagulation disorders have been reported in patients with severe hypothyroidism [17].

HYPOTHYROIDISM



DEFINITION

Deficiency of thyroid hormones causing slowed metabolism



COMMON CAUSES

Iodine deficiency, Hashimoto's thyroiditis, thyroidectomy



TYPICAL LAB FINDINGS

HIGH TSH
LOW FRE T4



PHYSICAL SIGNS

Dry skin, delayed reflexes, bradycardia, myxedema



ANTIBODIES

Anti-thyroid peroxidase (anti-TPO) common in Hashimoto's



TREATMENT

Levothyroxine replacement therapy

Hypothyroid tests Key antibodies to check

Thyroid Peroxidase Antibodies (TPOAb)

Thyroglobulin Antibodies (TgAb)

Elevated TPOAb and TgAb levels, along with abnormal TSH and T4 levels, strongly suggest autoimmune hypothyroidism

AIM:

To assess the causes of hypothyroidism and to understand its impact on quality of life of patient on their day-to-day life activities.

OBJECTIVE:

The study involves the following objectives:

- To understand the various causes of the hypothyroidism
- To assess the impact on lifestyle of the patient
- To know how crucial are the thyroid hormones for the functioning of various organs in our body.
- To get aware of the tragedy causing by the hypothyroidism in the effected patient.

NEED OF THE STUDY:

In recent days the incidence of hypothyroidism is increasing gradually among the children, adults, pregnant women and elderly people.

The cause of occurrence is different among different individuals and its impact also varies among the individuals.

So, it is important to understand the cause of hypothyroidism as well as its effect on day-to-day life activities of the hypothyroid patient.

To get aware of the crucial of the thyroid hormones balance for proper functioning of our body

LITERATURE REVIEW:

- **Rakesh Kumar Sahay et al;** reviewed management in pregnancy, where maternal hypothyroidism is linked to miscarriage, preterm birth and impaired neuro development in the child and he also shown that the women with the hyperthyroidism have decreased fertility, even if they conceive, risk of abortion is increased and risk of gestational hypertension, anaemia, postpartum hemorrhage is increased. The risk of this complication is greater in women with overt hypothyroidism rather than sub clinical hypothyroidism. This article shows the link between the hypothyroidism and its impact in pregnant women [18]
- **Taylor PN et al;** 2018; it highlights that iodine deficiency is the most common cause worldwide, while auto immune thyroiditis [Hashimoto's thyroiditis] dominates in iodine sufficient regions. this author shown that there is different cause for the hypothyroidism and it indicates that hypothyroidism in not caused by the single cause [19].
- **Luca Chiovato et al;** 2019; his article is representing that hypothyroidism is affecting up to 5% in world wide and 10.99% in India i.e, 1 in 10 people are suffering. Mostly used drug for the treatment is levothyroxine. Optimal treatment is required because nearly

one-third of the patients with treated hypothyroidism are still exhibiting symptoms. so based on this evidence further studies are required to know the quality of life of a hypothyroid patient [20].

- **Jornal De Pediatria et al;** 2007; this article is saying that the foetus gets the thyroid hormones from the mother during the pregnancy, these hormones are necessary for the development of brain in the fetus and the newborn infant. So if the pregnant women are having the hypothyroidism the foetus may not meet their need for the thyroid hormones which are crucial for the development of the baby. If the condition is not treated in the mother then it may lead to sub clinical hypothyroidism or hashimoto's thyroiditis, this may provoke damage not only to growth but also to the neurological and psychological development of these children [21].
- **Layal Chaker et al;** reviewed hypothyroidism, a thyroid hormone deficiency disease with prevalence ranging from 0.3% to 12% worldwide, more common in women and older people. They reported that hashimoto's thyroiditis is the major cause, and risk factors include genetics, iodine deficiency, thyroid gland surgery, radiation therapy, pregnancy, and

certain medications. Patients usually present with fatigue, weight gain, cognitive problems and menstrual irregularities and the condition can lead to infertility, miscarriage, cardiovascular disease, and even myxoedema coma if untreated. so it is necessary to give the optimal treatment for the patient quality of life and to subside the symptoms [22].

- **Shekarian, Mazaheri-Tehrani et al;** 2025; focused on pcos plus hypothyroidism -showing that sub clinical hypothyroidism is common among pcos, contributes to insulin resistance and highlights the needs for early screening or diagnosis [23].
- **Elisa Merchan-Ramirez et al ;** this study aimed to examine the relationship between diet, physical activity, sleep habits and thyroid hormone levels. The findings suggest that self-reported energy intake and adherence to mediterranean diet were negatively associated with thyroid function, while being physically active or having good sleep habits shown no significant association. The study concludes that dietary intake particularly energy intake and adherence to specific pattern maybe more influential on thyroid function than physical activity or sleep habits in young adults who do not have diagnosed with thyroid condition [24].

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- **Wiersinga WM et al;** 2014; The patients who are using the drugs for hyperthyroidism are also having the hypothyroidism at some point, because the drugs that are prescribing i. e, methimazole, polythiouracil etc. are causing drug induced hypothyroidism, not only this drugs but also other drugs such as lithium, thiocynate, perchlorate are also causing the drug induced hypothyroidism. So, from this we can say that their various causes for the occurrence of hypothyroidism [25].
 - **Rhanya Ghamri et al ;**2022, consistently demonstrated that patients with hypothyroidism experienced reduced HRQoL compared to general population with particular impairments noted in physical functioning and psychiatric parameters such as depression and anxiety. Female gender has increased body weight [26].
 - **Anthony. P. Weetman et al;** 2022, said that biochemical normalization of TSH in hypothyroidism patients doesn't restore health related QoL. To better evaluation of outcomes these researchers used genetic questionnaire like sf -36 & WHOQoL as well as disease specific instruments such as the thyroid patient reported outcome which more sensitively measures. Overall, even after biochemical normalization the patients may persist long term health consequences and impaired QoL [27].
 - **Lottaellegard, Emily Krantz et al ;**2021, said that hypothyroidism patients experience higher levels of depression, anxiety. they used tools like SF36 and SF12 to capture symptoms like sleep disturbances and social isolation [28].
 - **Udit M Zamwar, Komal N Muneshwar et al;** reviewed that heridity is the one of the main causes of development of hypothyroidism in individuals who have history of hypothyroidism in their family. The chances of TSH being transferred from parents to children are 60% while that of free T4 is 20% to 60%. This signifies the chances of developing hypothyroidism in a healthy individual through heredity [29].
 - **Bernadette Biondi et al;** 2004; This study is showing that the cardiovascular risk in patients with hypothyroidism is related to an increased risk of functional cardiovascular abnormalities and to an increased risk of atherosclerosis .The pattern of cardiovascular abnormalities is similar in subclinical and overt hypothyroidism suggesting that a lesser degree of thyroid hormone deficiency may also affect the cardiovascular system and have impaired endothelial function.so this article is the evidence for comorbidity occurring secondary to
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hypothyroidism [30].

- **Peter N Taylor et al;** reviewed and stated that the most common cause is chronic auto immune thyroiditis [Hashimoto's thyroiditis], other risk factors include certain drugs eg; amiodarone and lithium, radioactive iodine treatment and prior thyroid surgery also noted that factors such as age and sex are important considerations [31].
- **Joseph M Danicic, Warnick, Mark et al;** 2021, are saying that hypothyroidism significantly impairs QoL of patient affecting physical, psychological and social functioning. despite the standard use of levothyroxine to normalise TSH, many patients experience dissatisfaction. Studies in India specially shows lower qualoity of life scores various Korean studies show no quality-of-life impairment which suggest that regional and methodological differences may influence outcomes [32].
- **Martin Feller, Marieke Snel, et al;** 2018, identified that thyroid hormone therapy was not significantly associated with improvement in general quality of life or thyroid related symptoms. these findings do not support the routine use of this therapy in adults with hypothyroidism or SCH [33].
- **Perros, Petros, Alexander Harriet,**

Hay et al; 2022, assessed these impacts using tools like sf 36 and typo which capture physiological concerns that patients prioritize over biochemical markers. the researchers have noted that a historical lack of studies specifically evaluating quality of life variation within the population [34].

REASEARCH GAPS:

- Fertility issues in male and female
- Inclusion of various categories of population (paediatric, pregnant women, lactating mothers, geriatric)
- Data covers the psychiatric patients.
- Inclusion of comorbidities
- Drug adherence rate

MATERIALS AND METHODS:

Source of data:

Data will be collected from the hypothyroidism patients in the tertiary care hospitals

Study site:

Tertiary care hospitals, Khammam

Study duration:

6 months

Study design:

Prospective observational study.

Sample size:

323 patients.

Inclusion criteria:

All the hypothyroid patients of age group upto 70 years [including the children, adults, pregnant women, breast

feeding women and elderly people] and also the patients with other comorbidities along with hypothyroidism. We will also include the psychiatric patients with hypothyroidism

Exclusion criteria:

Patients above 70 years of age having hypothyroidism and also the neonates

Data entry format:

Prepared questionnaire

Analysis of data:

Suitable statistical method.

EXPECTED OUTCOME:

- Identify the prevalence rate of hypothyroidism in the study population
- Understanding the various causes of hypothyroidism among different age group and different gender
- Understanding the major risk factors (age, sex, genetics, iodine intake, comorbidities)
- To assess how it is impacting on the patients' daily activities
- To know the importance of the thyroid hormones action on various organs for their functioning in our body.
- Determine how hypothyroidism affects physical, physiological and social well being
- Offer evidence to design preventive and management strategies.

- To assess Adherence of the drug
- Rate of presence of fertility issues

DISCUSSION:

This review explains progression of the disease and loss of quality of life. Indian statistics show that it is more prevalent than the worldwide statistics, which stresses the importance of screening intervention. Unremitting symptoms of treated patients could indicate hypothyroidism at the tissue level, comorbidities of autoimmune or psychosocial character.

The future study ought to assess combination T4/T3 therapy, Integration of patient-reported outcome and long cardiovascular outcome.

CONCLUSION:

Hypothyroidism is a widespread disorder that has a multidimensional effect. The patient-centered outcomes should be maximized by applying comprehensive management approaches that involve pharmaceutical care.

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