Thyroid Dysfunctions Among Patients at Nepalgunj Medical College: A Hospital Based Study

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ABSTRACT

Introduction: Thyroid disorders are prevalent and their manifestations are determined by the dietary iodine availability which is common in country. Thyroid dysfunction is common clinical finding among the people presenting to the hospital. Its prevalence increases with age. Screening of thyroid disease is advised in high risk population for the early diagnosis and treatment. **Objective**: Thyroid disfunction is most common clinical problem among male and female in Nepal. To find out thyroid disfunctions among patients at Nepalgunj Medical College. **Methodology**: This is a retrospective study carried out in the Department of Medicine, Nepalgunj Medical College, Nepal from January 2014 to June 2016 for the period of two years. A total of 200 patients who visited outpatient door with suspected thyroid disorders i.e. hypothyroidism, hyperthyroidism or to rule out thyroid disorders got their thyroid function test. Serum TSH and fT3 /fT4 estimations were carried out by Enzyme linked immune sorbent assay method. **Result**: Among 200 subjects, the prevalence of thyroid dysfunction was 20%. Females had more thyroid dysfunction than male. Hypothyroidism (15%) had higher prevalence compared to hyperthyroidism (5%). Higher prevalence of thyroid dysfunction was observed in patients between 14 - 45 years. **Conclusion**: This study revealed that hypothyroidism is predominant then hyperthyroidism. Females patients have more common thyroid dysfunction. True population surveillance is difficult and hence, presently it was aimed to carry out hospital based study on the incidence of thyroid disorders.

***Key words**: ELISA: Enzyme Linked Immune Sorbent Assay. TFT: Thyroid Function Test*

INTRODUCTION

Thyroid diseases are commonest endocrine disorders finding worldwide second to diabetes. Recent report shows that 300 million people in the world are suffering from thyroid disorders[1]. In Nepal too, there is a significant burden of thyroid diseases. With easy availability of thyroid function testing, increases the numbers of patients with symptoms who visited in hospital, might be attributable for clinical diagnosis and finding of the thyroids dysfunction in hospital setting[2].

Thyroid diseases are different from other diseases in terms of their ease of diagnosis, accessibility of medical treatment, and the relative visibility that even a small swelling of the thyroid offers to the treating physician. Early diagnosis and treatment remain the cornerstone of management[3].

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It has been shown to be the most common endocrine disorders in eastern region, central and far western region of Nepal. There are fundamental limitations in the epidemiological study of thyroid dysfunctions in relation to selection criteria of sample used, explanation of overt and subclinical hypothyroidism, and the influence of age, sex, genetic and environmental factors and various techniques used for the measurement of thyroid hormones[4]. Many aspects of the management of thyroid disorder have not yet been subjected to controlled clinical trials yet there are established practices, which have never been questioned. The Research Unit of the Royal College of Physicians of London, the Endocrinology and Diabetes Committee of the college, and the Society for Endocrinology set up a working group to Thyroid dysfunction is defined as the altered serum thyroid stimulation hormone (TSH) level with normal or altered thyroid hormones (free tri-iodothyronine- fT_3 and free thyroxine- fT_4)[5].

Different factors associated with thyroid dysfunction, congenital factors, and genetic predisposition, inadequate iodine intake, pregnancy, viral infections, radiotherapy, surgery, autoimmunity (Vanderpump et al., 2002; Wiersinga et al., 1995; Brownlie et al., 1990)[6]. The prevalence of hyperthyroid (13.68%), hypothyroidism (17.19%) in eastern Nepal (Helfand et al., 998) and 17.42% in western Nepal (Risal et al., 2010).The prevalence of thyroid dysfunction, by definition is the testing of the patients in various geographical regions, primary care clinics and in population that have not been screened previously(Parle et al., 1992; Friedman et al., 1999).American thyroid association recommended that adults be screened for

thyroid dysfunction by measuring serum thyrotropin concentration beginning at the age of 35 and every 5 years thereafter (Ladenson et al., 2000). Nepal is one of the high risk populations with its high prevalence of iodine deficiency disorder(Gelal et al., 2009). Thyroid dysfunction is a common endocrine disorder affecting about 300 million people worldwide and over half are presumed to be unaware of their condition[7]

Thyroid dysfunction is also a major health problem of Nepal with prevalence of nearly 30% of the population affected in eastern region of Nepal alone[8]. However, the prevalence and pattern of hypothyroid-ism depend on ethnic, geographic, and environmental factors including iodine intake status Hypothyroid-ism and hyperthyroidism are two widespread thyroid problems, of which hypothyroidism is much more common. These disorders are eight times more common in women than in men.[6] True population surveillance is difficult and hence, presently it was aimed to carry out hospital based study on the incidence of thyroid disorders.

MATERIAL AND METHODS

Study Design

This is a hospital based retrospective study conducted in the department of internal medicine, Nepalgunj Medical College Teaching Hospital. In this retrospective study, the patients visiting NGMC from year January 2014 to June 2016 with features of thyroid disorder (palpitation ,weight gain, menstrual disorder, tachycardia, diarrhoea, weight loss, thyroid swelling) were enrolled. Those patients on whom had performed the thyroid function test, {i.e. free tri-iodothyronine (fT_3), free thyroxin (fT_4) and thyroid stimulation hormone (TSH) were enrolled in the study. Subjects with incomplete thyroid function test were excluded from the study. The age and sex of the subjects were also noted. Total number of patients in the present study is 200.

Collection of Blood samples

2.0 ml. of venous blood was collected from the subjects attending hospital. Blood collected in plain vial was allowed to clot and centrifuged at 3000 rpm for 15 minutes. The separated serum was stored at -20 ^{0}C for hormone assay.

Assay of thyroid function panel

Thyroid function test panel (fT_3, fT_4 and TSH) were assayed by the ELISA method using standard kit. fT_3 and fT_4 were assayed by competitive immunoassay method and TSH was assayed by sandwich immunoassay method.

Statistical analysis

Data were entered and analyzed by Software Package for Social Science. Data were rep-resented as percentage, frequency, mean and standard error. Data were considered significant at $P<0.05$.

RESULT

In present retrospective study, a total of 200 subjects were enrolled from January 2014 to June 2016. Among these subjects 160 were female and 40 were male. The age of the patient range from 14-77 yrs. (33.23±138).

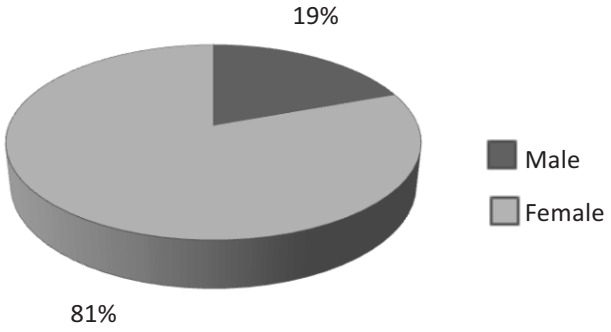

Figure 1: Sex distribution

The patients were classified according to thyroid status as Normal, Hypo-thyroidism, Hyperthyroidism, based on thyroid function test. Among these patients 80% are Euthyroidism, 5% hyperthyroidism and 15% are hypothyroidism.

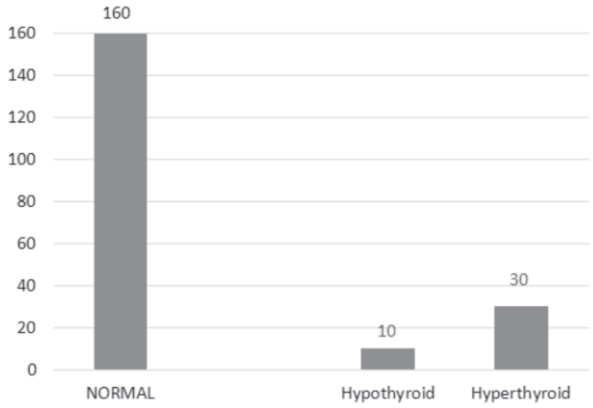

Figure 2: Prevalence of thyroid dysfunction

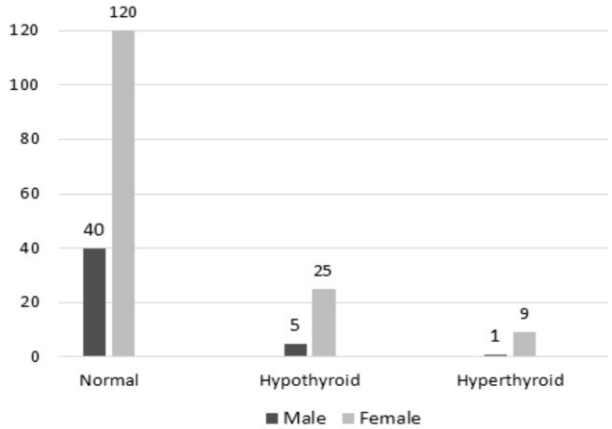

Figure 3: Gender wise prevalence of thyroid disfunction

Fig Comparsion of Thyroid hormone levels in males and females		
Thyroid hormone	male (Mean ± SE)	female(Mean ± SE)
T3	1.95±0.64	2.33±1.98
T4	1.35±0.33	1.7±0.7
TSH	6.08±10.62	4.09±8.98

AGE GROUP (in years) Thyroid Function						
	14-24	25-35	36-45	46-55	56-65	>65
normal	42	65	28	15	7	3
hyperthyrodism	1	6	1	0	1	1
hypothyrodism	10	15	3	1	0	1

Table I. Age wise distribution of thyroid dysfunction

DISCUSSION

Several studies have reported a high prevalence of thyroid disorders based on different geographical location, socio-demographical variation, ramification of thyroid status, physiological, biochemical changes and dietary evaluation for thyroid status[9].

In our study about 80% of the patients are females indicating that females are suffering from thyroid illness commonly[3]. The prevalence of thyroid disorders has been found to increase linearly with age and virtually all thyroid diseases are common in women. Similar finding is supported by few studies done by E.M.Der et al and Friedman et al[10]. This might reflect female are more susceptible to autoimmune disorder than male and playing key role in hypothyroidism

Estimates of the prevalence of thyroid dysfunction depend upon methodological factors, classifications of hypothyroidism, and composition of the community examined by age, ethnicity, and gender, making comparisons between studies of limited value. The prevalence and pattern of hypothyroidism depend on ethnic, geographic, and environmental factors including iodine intake status[6].

The prevalence of thyroid disorders seen in this study was 20% including both hypothyroidism and hyperthyrodism. It has been reported earlier that 20% overall prevalence of thyroid dysfunctions in eastern Nepal in subject above 20 years of age. Similar study conducted by Aryal M et al in Dhulikhel of Nepal has shown overall hypothyroidism case 16% .The prevalence of hypothyroidism in this study was 15% which is similar to study by Baral N et al 12 and Jha et al 15 as 13.68% and 17.19% respectively[11].

This prevalence may be due to geographical locations and pattern of iodine deficiency in these regions. The prevalence of hypothyroidism in various studies from around the world shows a considerable variation and its current prevalence ranges from as low as 1% to as high as 20% for subclinical and 1 – 2% for overt hypothyroidism[12].

In the present study, the prevalence of hypothyroidism were higher than hyperthyroidism. Hypothyroidisms are generally associated with iodine deficiency and Nepal is an endemic area of iodine deficiency with prevalence of approximately 26.5% of iodine deficiency disorder[13]. In a study conducted by Aryal et al, 2010 in Dhulikhel district near Kathmandu valley, the prevalence of thyroid dysfunction was 25% with Hypothyroidism and hyperthyroidism (3%). A study from eastern Nepal reported prevalence of hypothyriodism (17.19%) and hyperthyroidism (13.68%) among thyroid dysfunction (Baral et al., 2002)[8]. These findings support our study, which showed prevalence of thyroid disfunction (20%)[4,8].

Although all age group presented with thyroid dysfunction, a higher number of subjects were observed in the age groups of 31-45 years (Tunbridge et al., 1977) .In our study also the patient were also between 15-45 years. This study was similar with Dhok AJ et al[14]. Some studies have reported that obesity, diabetes, Metabolic Syndrome, and depression have association with thyroid dysfunction (Tunbridge et al., 1977)[2].

CONCLUSION

This study has revealed the prevalence of thyroid dysfunction typically hypothyroidism and were higher in mid and far western of Nepal. In addition, the role of depression, obesity and diabetes must be extensively studied and explicitly defined. The study recommends thyroid dysfunction screening and treatment campaigning in the general population of Nepal

to reduce the burden of disease. The prevalence based studies needs to be done to establish the reference intervals of thyroid hormones in Nepalese populations. Prevalence of thyroid disorders was high among the people of reproductive age groups. This problem should be addressed immediately by appropriate detection and early treatment to avoid deleterious effects on patients and their offspring.

Limitations of the study

The present study is based on serum fT3 fT4 and TSH measurement. Total T3, T4, Thyroglobulin, antithyroperoxidase, anti-thyroglobulin (anti-Tg), TSH receptor antibodies and thyroid stimulating immuniglobulin (TSI) were not included to rule out thyroid disease. The cutoff values of thyroid hormones (fT3 fT4 and TSH) used was those recommended by the manufacturer of the kit, and other related studies as few studies are performed in these regions to establish the reference intervals of thyroid parameters in Nepalese population. This study is hospital based study, with small sample size. so it does not represent the general population. However, because this study was hospital-based and because the study population constituted of subjects who came to the institute seeking TFTs, the results may not be applicable to the general population.

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