



Original Article

Prevalence of thyroid dysfunction in community of Duwakot, Bhaktapur

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ABSTRACT

Background: Thyroid dysfunction is one of the major public health problems in the Nepalese community and of the common endocrine disorders diagnosed in community primary health care centres. The aim of this study is to analyze the prevalence of Thyroid dysfunction in Duwakot, Nepal.

Materials and Methods: All the patients from Duwakot community who presented with the history of weight gain with tiredness and weight loss with palpitation were subjected to thyroid function test free triiodothyronine, free thyroxine and thyroid stimulating hormone.

Results: Thyroid dysfunction was found in 26% with M:F ratio of 1:5. Subclinical hypothyroidism 62 (11.44%) was the most prevalent one followed by Primary hypothyroidism 48 (8.85%), primary hyperthyroidism 16 (2.95%) and subclinical hyperthyroidism 15 (2.76%).

Conclusion: Thyroid dysfunction has been observed despite of nationwide program regarding supplementation of micronutrient iodised salt.

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INTRODUCTION

Thyroid dysfunction is one of the most common disorders, which is diagnosed among the patient seeking medical service in primary health care centers. Altered level of serum thyroid stimulating hormone (TSH) with normal or altered level of thyroid hormones which include free triiodothyronine (fT3) and free thyroxine (fT4) is defined as thyroid dysfunction.¹

Patients with thyroid dysfunction present with various non-specific symptoms and signs. Most common feature of hypothyroidism is tiredness and weight gain whereas features of hyperthyroidism are palpitation and weight loss.² Thyroid dysfunction increases the risk of osteoporosis, hyperlipidemia, hypercholesterolemia as well

as cardiovascular and neuropsychiatric disorders.³

The micronutrient Iodine deficiency has been found to be the most common cause of thyroid disorders worldwide.⁴ Their manifestations vary considerably from area to area and are determined principally by the availability of iodine in the diet.⁵

Almost one-third of the world's population lives in areas of iodine deficiency. The WHO estimates that two billion people, including 285 million school-age children still have iodine deficiency.⁵

The Nepal Iodine Deficiency Disorders Status Survey (2005) monitoring the effectiveness of iodination program, indicated iodine status sufficiency overall and among rural children, and excess iodine intake among urban children.⁶

The 2016 Nepal Demographic and Health Survey (2016 NDHS) estimated that the vast majority of Nepalese households consume salt with iodine; 95% of children live in households that consume iodized salt. The percentage of children living in households that use iodized salt is lowest in State 6 (82%), in the Mid-Western region, and in the lowest wealth quintile.⁷

Various studies of thyroid dysfunction epidemiology have been done around the world which shows different results depending on different community including different ethnic group and influence of iodine intake. Studies of prevalence of thyroid dysfunction in Nepal have been done in only some part of the country. It has been found to be one of the major public health problems in the Nepalese community.

Thyroid dysfunction has been found to be the most common endocrine disorders in south western, eastern and central region of Nepal.^{1,8-12} In this post-iodinization era, the evaluation of thyroid dysfunction prevalence frequency needs to be studied as there are various evolving risk factors. Regular screening program has to be carried out for early recognition and proper management of thyroid dysfunction. Thyroid dysfunction can be identified with the thyroid function test and can be planned for the proper management. It helps timely treatment of the disorder and in prevention of consequences of thyroid dysfunction. This study was carried out to find out the prevalence of thyroid dysfunction among the patients from Duwakot community attending Kathmandu Medical College Teaching Hospital, Duwakot, Nepal.

MATERIALS AND METHODS

This is a hospital based cross-sectional observational study carried out in Duwakot, Nepal, for a period of 1 year from January 2016 to January 2017. All the patients from Duwakot community who presented with the history of

weight gain with tiredness and weight loss with palpitation were subjected to thyroid function test which include free triiodothyronine (fT3), free thyroxine (fT4) and thyroid stimulating hormone (TSH). Permission was obtained from the Institutional review committee for the data collection and publication of the study.

The values obtained were co-related for thyroid dysfunction which was categorised as primary hypothyroidism, subclinical hypothyroidism, primary hyperthyroidism, subclinical hyperthyroidism and euthyroid. Interpretation of thyroid function test results were done as primary hypothyroidism (low T3, low T4, elevated TSH), subclinical hypothyroidism (normal T3, normal T4, mildly elevated TSH), primary hyperthyroidism (raised T3, raised T4, low or undetectable TSH), subclinical hyperthyroidism (normal T3, normal T4, low or undetectable TSH) and euthyroid (normal T3, normal T4, normal TSH). Data were analysed using Microsoft Excel.

RESULTS

Total numbers of patients attending KMC Community Hospital were 31,381 during our study period, out of which 542 (n=542) were screened for TFT. Out of these, 401(74%) were euthyroid and thyroid dysfunction was seen in 141 (26%). Out of total screened 542 patients, male patients were 86 (16%) and female patients were 456 (84%) with male to female ratio of 1:5. Among patients of thyroid dysfunction, male patients were 23 (16%) and female patients were 118 (84%) (M:F= 1:5)

Patients with primary hypothyroidism were 48 (8.85%), subclinical hypothyroidism 62 (11.44%), primary hyperthyroidism 16 (2.95%) and subclinical hyperthyroidism 15 (2.76%). Normal TSH value was seen in 104 cases (74%), elevated TSH in 28 cases (20%) and decreased TSH in 9 cases (6%). Patients with Primary hypothyroidism male were 11 (23%) and female were 37(77%). Subclinical hypothyroidism was seen in 6(10%) male and 56(90%) female.

Among the patients with primary hyperthyroidism male were 4 (25%) and female were 12 (75%). Subclinical hyperthyroidism was observed in 2 (13%) male and 13 (87%) female. Hypothyroidism was found more commonly among the age group of 45-54 years, subclinical hypothyroidism (TSH >) among 25-34 years, hyperthyroidism among 35-44 years & subclinical hyperthyroidism (TSH<) among the age group of 25-44 years. (fig.1)

DISCUSSION

Thyroid dysfunction is one of the most common endocrine disorders diagnosed in community primary health care centres in Nepal. It has been major public health problem in the Nepalese community. It is associated with significant

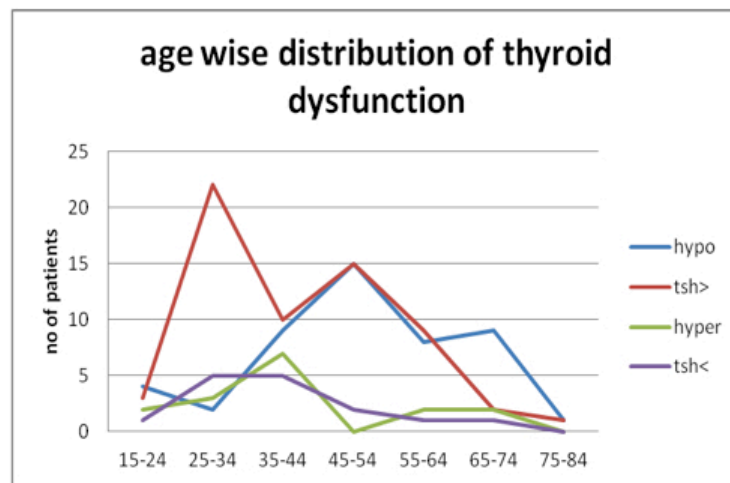


Figure 1: Distribution of thyroid dysfunction according to age.

consequences and usually has non-specific clinical presentation. Thyroid function test has been proven to be highly sensitive and specific in diagnosing thyroid dysfunction.

During our study period the total numbers of community people attending KMC Community Hospital were 31,381. Among those community patients who presented with the signs and symptoms suggestive of thyroid dysfunction screened which comprises 542 cases.

Out of 542 screened patients, 141 (26%) patients were found to have altered thyroid hormone level. This prevalence pattern is similar to the study done by Aryal M et al¹ and Regmi A et al¹¹ which shows 25% and 25.7 % respectively in the population of central Nepal. Various studies done in different geographical area with different ethnic community in south western, eastern and central region of Nepal have reported high prevalence of thyroid dysfunction. In south western Nepal, prevalence of thyroid dysfunction was 40.37% 8 in eastern Nepal 30.87%¹⁰ and in central Nepal 29%.¹²

Prevalence of thyroid dysfunction varies depending on different communities. Studies done in different part of the world shows different prevalence of thyroid function. A study done in India by Madhuvan HS et al⁷ and Begum F¹³ respectively revealed the prevalence of 25% and 21% whereas study done in Philippines by Carlos-Raboca J et al¹⁹ shows prevalence of 8.53 percent.

In our study, among the screened patients, male patients comprise 16% and female patients comprise 84%. The ratio of male to female was M:F=1:5. Among patients of thyroid dysfunction, again male patients comprises 16% and female

patients comprises 84% with the ratio of male female was M:F= 1:5. The prevalence of thyroid dysfunction was found to be higher in female population. In the studies done in various parts of Nepal by Aryal M et al¹, Rohil V et al⁹ and Jayan A et al⁸ showed the percentage of thyroid dysfunction was higher in female. Similarly study done in other Asian countries like Pakistan by Khan A et al¹⁴ and study done in India by Madhuvan HS et al¹⁵ also concluded with the higher prevalence of female diagnosed with thyroid dysfunction. Even in the study done in US population by Hollowell JG et al³ reported of female predominance with thyroid disorder. The ratio of prevalence of thyroid function has been seen higher in female in all the different national and international community.

In our study primary hypothyroidism were 48 (8.85%) cases, subclinical hypothyroidism 62 (11.44%) cases, primary hyperthyroidism 16 (2.95%) cases and subclinical hyperthyroidism 15 (2.76%) cases. Normal TSH was found in 74 with elevated TSH in 20% (hypothyroidism) and depressed TSH in 6% (hyperthyroidism). The prevalence of hypothyroidism is higher than hyperthyroidism.

The various studies done in eastern, western and central Nepal also shows the similar trend of higher prevalence of hypothyroidism among the study population.^{1,8,10-12} International studies also showed the similar result of higher prevalence of hypothyroidism than hyperthyroidism.^{3,13-18}

In our study, prevalence of all types of thyroid dysfunction were found to be higher among female than in male. Among patients with primary hypothyroidism, male were 11(23%) and female were 37 (77%). Among patients with subclinical hypothyroidism, male were 6 (10%) and female were 56 (90%), with primary hyperthyroidism, male were 4 (25%) and female were 12 (75%) and among subclinical

hyperthyroidism, male 2 (13%) and female 13(87%).

Hypothyroidism was found most commonly among the age group of 45-54 years; subclinical hypothyroidism among 25-34 years; hyperthyroidism among 35-44 years and subclinical hyperthyroidism among the age group of 25-44 years.

The findings are different in different studies. The study done by Jha B et al¹⁹ showed that hypothyroidism was seen more in the age group of 71-95 years and hyperthyroidism in 15-44years. Another study by Regmi et al¹¹ showed that hypothyroidism was seen more in the age group of 40-60 years and hyperthyroidism in 20-40 years. Aryal M et al¹ study showed high number of hypothyroidism among age group of 15-30 years. Prevalence of thyroid dysfunction was seen higher in reproductive age group 21-40 in the study done by Jayan A et al.⁸

CONCLUSION

Despite of nationwide programs regarding supplementation of micronutrient iodised salt, the prevalence of thyroid dysfunction has been observed higher in different communities of Nepal. The evaluation of thyroid dysfunction in larger population needs to be planned for future research. Proper implementation of screening program could reduce the economic and psychological burden to the individuals caused by the morbidity of thyroid dysfunction.

Conflict of Interest: None

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