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A study on thyroid disorders in suspected cases attending Om Hospital and Research Centre during 1996-1998

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ABSTRACT

Altogether 735 suspected individuals were undertaken for their thyroid function test. For this total T3, T4 and TSH were estimated by ELISA (Serozyme) technique. All the suspected cases attended Om Hospital and Research Centre from 1996 to 1998. In age-sex composition, it was observed that the patients who were advised to do thyroid function test were more likely to be female, the ratio being M:F=1:3. Similarly, younger and elderly age group are found less as compared to other age group. The prevalence of hypothyroidism, hyperthyroidism and hypothalamic disorders, T3-toxicosis and T4-toxicosis are 9.9/100, 15.1/100, 6.4/100, 8.9/100, and 4/100 respectively.

The prevalence of hyperthyroidism is significantly highest followed by hyperthyroidism and T3-toxicosis among the different thyroid disorders. Hypothyroidism is found to be significantly higher in females whereas hyperthyroidism is high in males. Moreover, all types of disorders are found to be significantly different in both the sexes. When these disorders are divided into different age groups, the prevalence of all types of these disorders was not found significantly different among age groups. But the types are significantly different in 15-44 and 45-70 years age groups.

Keywords: Total T3 and T4; TSH test; Hypothyroidism; Hyperthyroidism; Hypothalamic disorders; T3-toxicosis and T4-toxicosis.

INTRODUCTION

The current state of malnutrition in Nepal is described with particular reference to child

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malnutrition, endemic goitre and cretinism, nutritional anaemia and xeropthalmia.[1] A study in Jumla showed 137 cases of goitre and 31 cases of cretinism out of 1836 patients.[2] Lesser forms of iodine deficiency are widely prevalent and justify the periodic injection of iodinated oil and introduction of iodized salt.[3] Thyroixine or (T4) is a thyroid hormone with a molecular weight of 777 kDa; is synthesized in the thyroid gland by iodination of tyrosine bound to specific protein thyro-globulin.[4] T4 is stored in the follicles of the thyroid gland, and when needed, it is released into blood stream by hydrolyzing thyro-globulin.[5] T3, Triiodothyronine, molecular weight 651 kDa, is exclusively the product of thyroid gland. In normal subject about 80% of T3 is produced by peripheral conversion and about 20% is secreted by thyroid.[6]

The objective of this study was to find out the prevalence proportion of thyroid disorders by estimating total T3, T4 and TSH among the suspected cases attending Om-hospital and Research Centre during 1996-1998.

MATERIALS AND METHODS

In total, blood samples of 735 suspected patients attending Om-hospital and Research Centre were collected, centrifuged and their serum preserved. The quantitative determination of total T3, T4 and TSH was done by Enzyme Immunoassay (Magnetic Solid Phase). In all, sample control and standard thyroid hormones competed with fixed amount of thyroid hormones alkaline phosphates derivatives for binding to a limited amount of antithyroid hormones monoclonal antibody labelled with florescence. The anti florescent coupled with magnetic solid phase added in access. Then they were decanted and washed and further incubated with an enzyme substrate. Finally, enzyme reaction was determined by adding stop solution, and the developed colour was measured photometrically by Serano (Serozyme 1). All results were presented in percents and they were compared by chi-square test to see their significance level or p-value.

RESULTS AND DISCUSSIONS

The results obtained are as follows.

Table I: Distribution of patients according to age group and sex.

Age groups of Patients in Years	*Sex of the Patient*		*Total (%)*
	Male	*Female*	
0-5	4	6	10 (1.4)
6-14	6	26	32 (4.3)
15-44	108	337	445 (60.6)
45-70	51	159	210 (28.6)
71-95	9	29	38 (5.1)
Total	178 (24.2)	557 (75.8)	735 (100.0)

It is observed that the patients who were advised to do thyroid function test were more likely female with the ratio of M:F=1:3. Similarly, early aged and elderly were also found less; altogether it is about 10% only.

Table II: Prevalence proportion of different types of thyroid disorders in the patients.

Type of disorders	*Cases per 100 patients*
Hypothyroidism	9.5
Hyperthyroidism	15.1
Hypothalamic disorder	6.4
T3-toxicosis	8.9
T4-toxicosis	3.4
p-value	0.0000

Hyperthyroidism is highly detected. More or less hypothyroidism and T3-toxicosis are also in second prevalent disorders. The prevalence proportion of different disorders seems to be highly significant.

Types of disorders	*Cases per 100 patients of different sex groups*		*p-value*
	Male	*Female*	
Hypothyroidism	11.2	8.5	0.2801
Hyperthyroidism	10.1	16.1	0.0552
Hypothalamic disorder	5.3	6.8	0.4986
T3-toxicosis	8.9	8.3	0.8152
T4-toxicosis	3.6	3.2	0.8278
p-value	0.0416	0.0000	X

Hypothyroidism is found to be significantly higher among females than in males. Moreover, all types of disorders are found significantly different in both sexes.

Table III: Prevalence proportion of different types of thyroid disorders in different sex groups.

Table IV: Prevalence proportion of different types of thyroid disorders in different age groups.

Types of disorders	*Cases per 100 patients of different age group in years*					*p-value*
	0-5	*6-14*	*15-44*	*45-70*	*71-95*	
Hypothyroidism	18.2	6.2	6.6	8.1	20.8	0.0934
Hyperthyroidism	0	12.5	14.7	13.3	8.3	0.2647
Hypothalamic disorder	0	12.5	7.7	5.2	-	0.6358
T3-toxicosis	9.1	18.8	9.4	4.4	-	0.0977
T4-toxicosis	0	6.2	2.8	4.4	4.2	0.8452
p-value	0.808	0.477	0.000	0.018	0.160	X

When different disorders are divided into different age groups, all the disorders were not found significantly different among age groups. But the types are found significantly different in 15-44 and 45-70 years age groups. This may occur at any age, unset majority of the cases appear in the fifth and sixth decades of life. An incidence of hypothyroidism of 2-3

percent were found in 2000 randomly screened geriatric patients.[11] This shows that the type of disorder varied in certain age groups.

Screening programme for congenital hypothyroidism has been established in almost all the developed countries[7] but it is yet to start in Nepal. In our study, at 0-5 age group, hypothyroidism is 18.2, but hyperthyroidism is 0%. Hyperthyroidism is uncommon below the age of five years but is occasionally reported as a cause of failure to thrive.[8,9] In our study, Hypothyroidism is 9.5% (see table II); it runs to be a common disorder that occurs in mild or severe forms in 2 to 13% of the population.[10] The prevalence of hyperthyroidism is fairly low in the general population (0.3-0.6)[11] but found high, which maybe the cause of only suspected cases, come to our country. Female to male ratio in the case of hypothyroidism is more (table III) whereas hypothyroidism occurs pre-dominantly in women with a female to male ratio of 5:1. This result maybe due to the fact that more suspected male patients come to our centre.

CONCLUSION

- Prevalence of different thyroid disorders found in our study in Nepali subjects are similar to the other part of the world.
- Female to male ratio of hypothyroidism is less in Nepali subjects than the people in other parts of the world.
- The prevalence of hyperthyroidism is found high in our study as compared to other parts of the world.

Hence in-depth study has to be carried out in the Nepali Population (community-based).

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