THYROID HORMONE DYSFUNCTION AMONG ADOLESCENTS IN MANIPUR

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ABSTRACT

Background: In Manipur and perhaps other Northeastern region, thyroid disorders in adolescence have not been sufficiently studied. Where studies are available, they were either conducted decades ago or they were involved only child and adults.

Methods: In this retrospective study, the case notes of all adolescents with thyroid disorders seen in the Endocrinology clinic, Psychiatry clinic, Dermatology clinic and of those admitted into the wards of Medicine of Regional institute of medical sciences (RIMS) were audited. Information extracted included age, gender, duration of symptoms before presentation, laboratory test results, management challenges and admission outcome. The total number of cases seen at the Endocrinology clinic, Psychiatry clinic, Dermatology clinic and Medicine ward of RIMS was derived from the clinic attendance register of the department.

Results: Of the 500 cases seen during 5 years period 192(38.4%) cases had thyroid disorders. During the 5-year period, 82(45.55%) female had hyperthyroidism, 78(43.33%) female had hypothyroidism, 11(6.11%)female had subclinical hypothyroidism, 8(4.44%)female had overt hypothyroidism, 1(0.55%)female had central hypothyroidism. In male 29(52.72%) had

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hyperthyroidism, 17(30.9%)had hypothyroidism,7(12.72)had subclinical hypothyroidism, 2(3.63%)had overt hypothyroidism. Mean age is 15.05(21.2% confidence interval) with median 15 and standard deviation of 2.37(+/- mean) and male-to-female ratio was 3:1. General age group is of 21.2% (15 years). On comparison of sexes male were of 27% and female 73%. The management challenges encountered included suboptimal diagnostic facilities and high clinic default rate.

Conclusion: Hyperthyroidism was the most common form of thyroid disorders observed and patients with thyroid disorders tended to present late. Suboptimal diagnostic facility and high clinic default rate were the principal management challenges encounterd.

Keywords: adolescence, management challenges, thyroid disorders.

Abbreviations: TSH= Thyroid stimulating hormone; USI= Universal salt iodization; T4= Thyroxine; T3= triiodothyronine; RIMS= Regional institute of medical sciences.

INTRODUCTION

Thyroid disorders is one of the endocrine disorders commonly encountered in adolescence and they manifest with qualitative or quantitative alterations in thyroid hormone secretion, goiter or both (Desai 2009; La Franchi 2007). Insufficient hormone secretion results in hypothyroidism and excessive secretion causes hyperthyroidism which causes disturbances of metabolic function in adolescents. Despite this profound effect of thyroid dysfunction in adolescents, there are very few studies that have examine adolescent thyroid disorders in Northeastern region and other developing countries (Laditan 1979). Majority of the available studies, either involved only adults or were conducted decades ago (Laditan 1979; Edino et al 2004; Tsegaye and Ergete 2003; Ogbera 2010). The aetiology, prevalence, clinical presentation, and clinical course of thyroid disorders in adolescents substantially differ from that of adults (Bettendorf 2002).

The incidence of thyroid disorders in adolescents appears to be increasing. For instance Rallison et al reported an initial incidence of 3.7% for thyroid disorders but 20 years later, a repeat population by the same investigators found an incidence of 10.7% (Rallison 1991).

It has been documented that the most common presentation of thyroid disease during adolescence is an asymptomatic goiter with an incidence of 9 per 1000 per year and a female preponderance (Famuyiwa 1990a). Various reports indicate that iodine deficiency is the commonest cause of thyroid disorders in Manipur.

The purpose of this study was to describe the prevalence of thyroid disorders in adolescents seen in RIMS, IMPHAL, MANIPUR between 2010 – 2014 and highlight some of the management challenges encountered.

SUBJECTS AND METHODS

The study was conducted in the Department of Biochemistry with the help of Department of Endocrinology, Dermatology, Psychiatry clinic and patients admitted in Medicine ward, RIMS, IMPHAL, MANIPUR and involved patients seen between 2010 – 2014. Patients seen in the hospital are all mainly from Manipur state and other neighbouring state (like Nagaland, Mizoram). The Endocrinology Clinic of RIMS receives referrals from both within and outside the hospital (RIMS).

In this retrospective study, the cases were identified by examining the relevant hospital attendance/admission registers and auditing the case notes of adolescents seen at the Endocrine clinic and of those patients seen in Psychiatry clinic and Dermatology clinic at the university of Regional institute of medical sciences (RIMS), IMPHAL, MANIPUR. The diagnosis of thyroid disorders was based on thyroid function tests which included determination of serum levels of thyroxine (T4), triiodothyronine (T3) and thyroid-stimulating hormone (TSH). Information extracted included age, gender, duration of symptoms before presentation, laboratory tests results, management challenges, and outcome of admission. The total number of new cases seen in the Endocrine clinic, Department of Psychiatry, Department of Dermatology in RIMS was noted. Statistical analysis involved calculation of percentages, means, medians, ratios and confidence intervals.

RESULTS

During the 5-year period under review, a total of 500 cases (old and new) were seen at the Endocrine clinic, including records from Psychiatry and Dermatology clinic, RIMS. Of these 192(38.4%) had thyroid disorders, 82(45.55%) female had hyperthyroidism, 78(43.33%) female had hypothyroidism, 11(6.11%) female had subclinical hypothyroidism, 8 (4.44%) had overt hypothyroidism, 1(0.55%) had central hypothyroidism. Whereas in male, 24(52.72%) had hyperthyroidism, 17(30.9) had hypothyroidism, 7(12.72%) had subclinical hypothyroidism, 2(3.63%) had overt hypothyroidism. For normal adolescents mean age is 15.15 +/- 2.47

SD(21.2% CI) with median 15 and SD of 2.37(+/-), male to female ratio is 3:1,i.e., male is 135 in number(27%) and female is 365 in number(73%), who were all registered in Endocrinology, Psychiatry, Dermatology and those admitted in Medicine ward(Figure 1). General age group is of 21.2% (15 years). Including both male and female, normal cases are 308(61.6%), hyperthyroidism are of 102(20.4%), hypothyroidism 32(6.4%), subclinical hypothyroidism 47(9.4%), overt hypothyroidism 10(2.0%) and 1(0.2%) had central hypothyroidism (Figure 2). Hypothyroidism is 15.13% with +/- 2.39 SD, Subclinical hypothyroidism is 14.68% with +/- 2.12 SD, overt hypothyroidism is 15.5% with +/- 1,26 SD. The 17- year old girl with hyperthyroidism had goiter for 10 months and amenorrhoea for 12 months before presentation. No history of use of oral contraceptive. The two patients had elevated serum levels of T4 and T3 with elevated TSH level. Of the patients with hyperthyroidism, 22 of the patients still attends follow up clinic. This necessitate employing better encouragement and management. Also in Manipur, maximum of the patients ,i.e.,284(56.8%) were from urban and patients,i.e.,216(43.2%) were from rural area(Figure 3). This indicates that people living in urban area seems to be more educated and concerned about their health. In religion wise, Hindu comprises the maximum ,i.e., 373(74.6%), next is christian with 43 in numbers (8.6%) and 43 cases (8.6%) was found among muslims (Figure 4). Religion comparison was done as Manipur is rich in religion and culture.

DISCUSSION

The prevalence of thyroid disorders in the present study was 1.5 fold higher than the prevalence (0.07%) reported, two decades ago, from Regional institute of medical sciences (RIMS). There is no readily available explaination for the higher prevalence found in the study. In this study, the prevalence of thyroid disorders is higher in girls than boys. With a ratio of 3:1. This is not surprising as other studies have reported a similar female preponderance (Laditan 1979; Rallison et al 1991; Ogbera and Kuku 2011). In the present study hyperthyroidism is more common of all thyroid disorders observed among the patients. Although the present study was not designed to examine the effect of iodine intake on the pattern of thyroid disorders in Manipur, it is possible that the universal salt iodization (USI) policy adopted by Manipur government might have a bearing to the relatively greater proportion of patients with hyperthyroidism in the present study compared to other studies which was conducted before the USI programme (Laditan 1979). This

view is reinforced by the report of several recent studies which have conclusively shown that the risk of hyperthyroidism is increased in chronically iodine-deficient individuals who are exposed to sharp increases in iodine intake (Todd et al 1995; Delange et al 1999; Lauberg et al 1998; Doufas et al 1999; Boudoux et al 1996). Considering the recent successful USI policy in other developing countries, this scenario is possible and may partly explain the greater proportion of hyperthyroidism in the present study

As in other reports, (Rallison et al 1991; Ogbera and Kuku 2011) the present study revealed that majority of thyroid disorders presented during the period of adolescence with 15.15 years as the mean age at presentation.

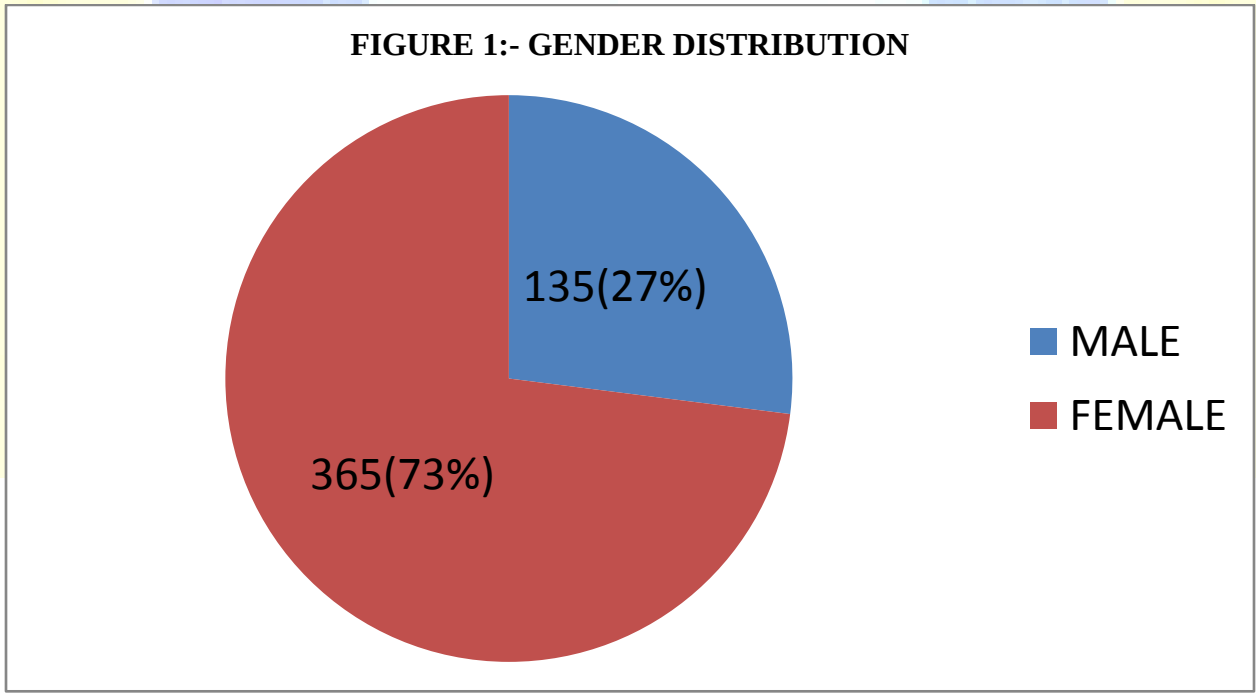
The unique features of the patients seen in the present study were late presentation with florid signs of either hypothyroidism or hyperthyroidism and poor clinic attendance. The reason for the late presentation might be due to a lack of awareness concerning endocrine disorders among adolescence in Manipur; a factor that has been previously emphasized by Famiyuwa in UCH, Ibadan (Famuyiwa 1990a). The present study revealed that duration of symptoms before presentation was shorter in hyperthyroidism compared with hypothyroidism, suggesting that patients with hyperthyroidism tended to present comparatively earlier than patients with hypothyroidism. This finding may be explained by the more insidious onset of hypothyroidism compares with hyperthyroidism. In the study majority of the patients were also lost to follow-up making it difficult to document outcome of treatment. The high level of illiteracy and widespread poverty in Manipur might be responsible for high clinic default rate observed in this study.

There were no cases with thyroid nodules whether solitary or multiple among the patients seen in the present study. This observation is in RIMS, Manipur suggesting that thyroid nodules are not common in adolescence (Laditan 1979). In the present study, the most common thyroid disorder observed presentation of thyroid disorders in adolescence was hyperthyroidism. This is in contrast to reports from the United States which stated that the most common presentation of thyroid disorders in adolescence was asymptomatic goiter (Neinstein and Kaufman facility in the United States, enhancing their diagnostic capability. Inadequate laboratory facility for detailed evaluation of endocrine disorders that has been previously documented as one of the major management challenges with regard to practice of endocrinology in developing (Famuyiwa 1990a).

For the purpose of this discussion, the management challenges encountered in these patients with thyroid disorders may be categorized into two: diagnosis and therapy. In the two cases with nongoitrous hypothyroidism, it would have been worthwhile to investigate peroxidase deficiency because this is one of causes of congenital hypothyroidism with insidious onset (LaFranchi 2007). In the only case of euthyroid goiter, it would have been useful to establish the presence or absence of thyroid antibodies but we could not do this because of lack of follow up and patients not reporting for follow up. The only treatment available for hypothyroidism is levo-thyroxine and some of the patients do not take the dose properly, or sometimes there is a change in the brand name of levo-thyroxine which confuses the patients. Changes in brand has been observed to influence the effective dose.

In conclusion, it was observed that hyperthyroidism constituted the greatest proportion of the thyroid disorders seen between 2010-2014 and most patients with thyroid disorders tended to present late. Management challenges included awareness regarding regular follow up by patients and a high clinic default rate.

FIGURE 1:- GENDER DISTRIBUTION



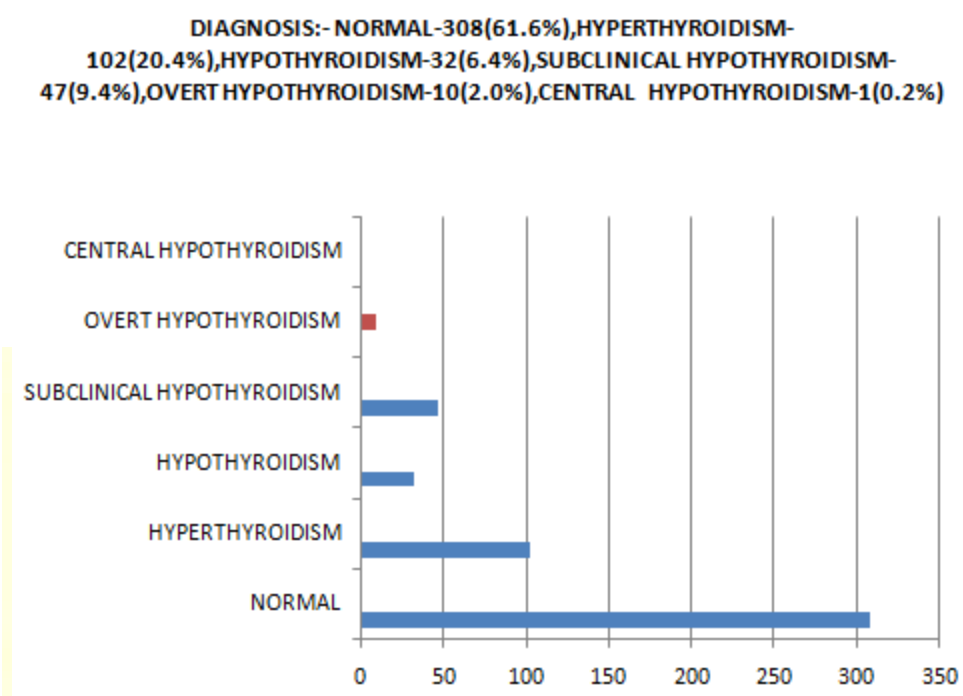


FIGURE 2: DIAGNOSIS OF CASES ACCORDING TO DIFFERENT CLASSES OF THYROID DISORDERS

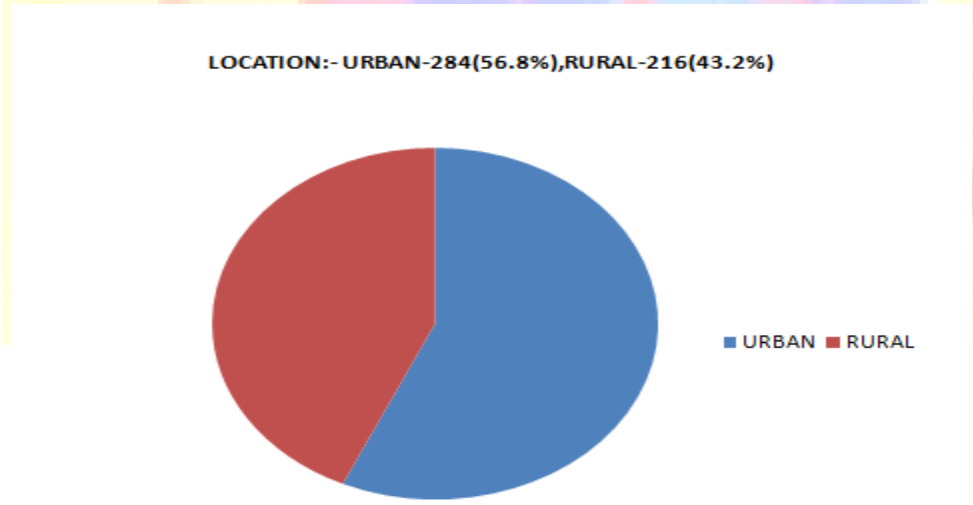


FIGURE 3: LOCATION OF PATIENTS COMING FROM DIFFERENT PLACES ACCORDING TO RURAL AND URBAN AREAS

RELIGION:- HINDU-373(74.6%),MUSLIM-43(8.6%),CHRISTIANS-84(16.6%)

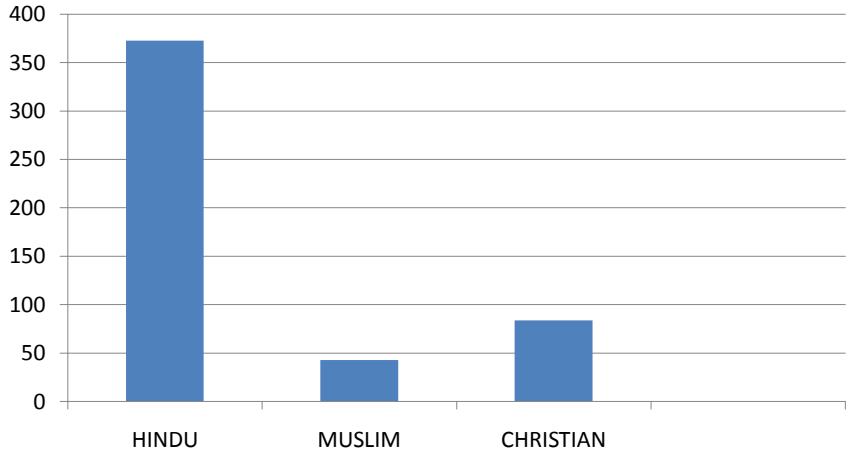


FIGURE 4: DIFFERENTIATION OF PATIENTS WITH THYROID DISORDERS ACCORDING TO RELIGION

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