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Original Research Article

A prospective study of hypothyroidism in tribal women of East Godavari, Andhra Pradesh, India

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ABSTRACT

Background: Hypothyroidism is usually categorized under iodine deficient disorder. Ever since universal salt iodization programme is adopted in India there is shift in balance from iodine deficiency to sufficiency state. But studies conducted by various authors during post - iodization period indicated that hypothyroidism is still prevalent in India despite of promotion of iodised salt. So due to lack of information on thyroid status of women in East Godavari of Andhra Pradesh. This study has been conducted to study the hypothyroidism in tribal women in this region.
Methods: This is a prospective cross-sectional study conducted in the department of General Medicine Konaseema Institute of Medical Science Godavari between July 2015 to November 2017. Based on specific clinical symptoms of hypothyroidism among 4680 women patient who has attended the health camp 864 patients were selected for haematological evaluation.5ml of fasting blood was collected and thyroid function test was done by estimation of T3, T4, and TSH levels in serum by using ROCHE COBASE-411 immunohistochemistry Analyser.
Results: Out of 864 women 342(39.50%) women were euthyroid out of that 84(9.72%) were 15 to30yrs of age, 192(22.2%) were between 31 to 45 years of age and 166(19.21%) were between46 to 65yrs. 316(36.57%) women were having subclinical hypothyroidism, among them 48(5.5%) were between 15 to 30yrs of age, 178(20.60%) were between 31 to 45yrs age and rest 90(10.41%) were between 46 to 65yrs of age. 110 patients were suffering from hypothyroidism that is 12.73%, out of that 12 were between 15 to 30yrs of age, 62(7.17) patients were between 31 to 45yrs age and rest were between 46 to 65yrs that is 36(4.16%).
Conclusions: In this study we have found that subclinical hypothyroidism is more common than hypothyroidism. Author have also found that thyroid disorder was more common in reproductive age group tribal women in east Godavari dist. of Andhra Pradesh.

Keywords: Hypothyroidism, Subclinical hypothyroidism, Tribal women

INTRODUCTION

Disorders of thyroid gland are among the most common disorder of endocrine gland next to diabetes mellitus. Hypothyroidism and hyperthyroidism both are common finding, but incidence of hypothyroidism is common than hyperthyroidism that is 2% and 1% respectively. The prevalence in women is 10 times more than man.[1] Hypothyroidism can be easily diagnosed and managed but it become potentially fatal in severe cases if untreated.

Clinical manifestations of this disorder range from no signs or symptoms to life threatening.[2]

Hypothyroidism is usually categorized under iodine deficient disorder. Ever since universal salt iodization programme is adopted in India there is shift in balance from iodine deficiency to sufficiency state. But studies conducted by various authors during post - iodization period indicated that hypothyroidism is still prevalent in India despite of promotion of iodised salt.[3,4] But the studies conducted are limited to certain geographical area and some cities, so it is non-uniform. There are studies in tribal population, but no study is available in this region. So due to lack of information on thyroid status of women in East Godavari of Andhra Pradesh. This study has been conducted to study the hypothyroidism in tribal women in this region.

METHODS

This is a prospective cross-sectional study conducted in the department of general medicine Konaseema Institute of Medical Science Amalapuram, Godavari, Andhra Pradesh, India between July 2015 to November 2017.

For this study various camp conducted in tribal region of east Godavari and the female patients between 15yrs to 65yrs of age with symptoms of hypothyroidism were enrolled for study.

Inclusion criteria

- Female patients between 15 to 65yrs of age, with symptoms of hypothyroidism

Exclusion criteria

- Pregnancy
- Chronic or acute illness,
- Drug consumption which can interfere with thyroid function

Sample size was calculated based on prevalence of hypothyroidism in previous studies, and precision of 5%. 2011 census data of tribal population of East Godavari was also taken into consideration. It was calculated to be 662.[5]

During the period of two years and four months 16 health camp were conducted in tribal regions of East Godavari, care was taken to prevent repetition of same individual. Based on specific clinical symptoms of hypothyroidism among 4680 women patient who has attended the health camp 864 patients were selected for hematological evaluation.

Five (5) ml of fasting blood was collected and thyroid function test was done by estimation of T3, T4, and TSH levels in serum by using ROCHE COBASE-411 immuno-histochemistry analyzer. Based on result patients were distributed into euthyroid, sub clinical thyroid and Hypothyroid. Patient with normal T3 T4 and TSH was considered euthyroid, Pt with elevated TSH but normal T3 and T4 level was considered sub clinical and patients with decreased T3 and T4 and elevated TSH was considered hypothyroid.[6,7]

A permission from institutional ethics committee was obtained before start of the study. A written informed consent was also taken from each patient who was enrolled in this study.

Statistical analysis

Data collected and were compiled on Microsoft excels and analysis was done by using proportion and chi square test.

RESULTS

Out of 4680 tribal women of this region 864 patients with the symptom of hypothyroidism were selected from them for hematological evaluation. Among 144 (16.6%) were between 15 to 30yrs age, 432 (50%) were between 31 to 45yrs of age and remaining were between 46 to 65yrs of age.

Table 1: Age distribution of patients.

Age	Number (n=864)	Percentage
15-30 years	144	16.6
31-45 years	432	50
46-60 years	288	33.33

Out of 864 women 342(39.50%) women were euthyroid out of that 84 (9.72%) were 15 to 30yrs of age, 192 (22.2%) were between 31 to 45 years of age and 166 (19.21%) were between46 to 65yrs. A total 316 (36.57%) women were having subclinical hypothyroidism, among them 48 (5.5%) were between 15 to 30yrs of age, 178 (20.60%) were between 31 to 45yrs age and rest 90 (10.41%) were between 46 to 65yrs of age. Among 110 patients were suffering from hypothyroidism that is 12.73%, out of that 12 were between 15 to 30yrs of age, 62(7.17) patients were between 31 to 45yrs age and rest were between 46 to 65yrs that is 36(4.16%).

Table 2: Distribution of thyroid disorder among the patient with clinical symptoms.

Age (year)	Euthyroid no. (%)	Sub clinical no. (%)	Hypothyroid no. (%)
15-30	84 (9.72%)	48 (5.5%)	12
31-45	192 (22.2%)	178	62
46-60	166 (19.21%)	90	36
Total	342 (39.50%)	316	110

Mean value of T3 in euthyroid pts were 166.64mg/dl mean value of T4 was 9.64ug/dl and mean value of TSH was 2.8714 IU/ml (Table 3). Mean value of T3 was 126.262 mg/dl, T4 was 8.34mg/dl and TSH was 8.68µIU/ml in subclinical hypothyroid patients. In hypothyroid patients serum T3 level was 72.83mg/dl,

serum T4 level was 2.96mg/dl and TSH level was 63.792µIU/ml.

Table 3: Comparisons of thyroid hormone levels in different group of patients.

	T3 (mean) (ng/dl)	T4 (mean) (µg/dl)	TSH (mean) (µIU/ml)
Euthyroid	166.64	9.64	2.87
Sub clinical	162.262	8.34	8.68
Hypothyroid	72.83	2.96	63.792

The chi-square statistic 127.8028 P vale <0.00001

Table 4: Comparison of the thyroid hormone level arrange hypothyroid age groups.

Age	T3 (mean) (ng/dl)	T4 (mean) (µg/dl)	TSH (mean) (µIU/ml)
15-30	74.756	3.16	74.34
31-45	70.41	2.99	59.344
45-65	69.62	3.4961	64.82

The chi-square statistic 0.6019 P-value 0.961955

Regarding comparison of thyroid hormone level among various age group of hypothyroid patients (Table 4). In 15 to30yrs age group T3 level was 74.756mg/dl T4 concentration was 74.34uIU/ml. In 31 to 45 yrs age group T3 concentration was 70.41 mg/dl T4 contrition was 2.99ug/dl.

ANF TSH level was 59.344. Similarly, in 46 to 65yrs of age group T3 contrition was 69.62mg/dl, T4 contrition was 3.4961ug/dl and TSH contrition was 64.82µIU/dl. As these relations was not significant with p value 0.961955.

Table 5: Comparison of thyroid hormones level among subclinical hypothyroid age group.

Age	T3 (mean) (ng/dl))	T4 (mean) (µg/dl))	TSH (mean) (µIU/ml)
15-30	129.09	8.54	8.27
31-45	126.9	8.27	7.66
45-65	120.6	8.52	6.53

The chi-square statistic 0.0631 P value 0.999512

Regarding comparison between thyroid hormone level in different age group in subclinical hypothyroid group, between 15 to 30yrs of age mean T3 level was 129.09 ng/dl, mean T4 level was 8.54ug/dl and mean TSH level was 8.27µIU/dl. In 31 to 45yrs of age group mean serum T3 concentration was126.9ng/dl, mean T4 concentration was 8.27ug/d and mean TSH level was 7.66uIU/ml.

Similarly, in 46 to 65yrs of age group, mean T3 level was 120.6ng/dl, mean T4 level was 8.52ug/dl and mean TSH level was 6.53uIU/ml. This relation was not significant as p value was 0.999512.

DISCUSSION

Out of 4680 women attended the health camp during two years and four months duration, out of that 864 patients were having symptoms of hypothyroidism. Among them, most of the patients (50%) were between 31 to 45yrs of age, 16% were below 30yrs of age, and rest were above 45yrs. Out of 864 patients 12.73% of the patients were having hypothyroidism and 36.73% of the patients were suffering from subclinical hypothyroidism. Incidences of both were higher among 31 to 45 years of age. This data is supported by the work of Chakrabarty BK et al.[8] As per his study the common age of the patients 30 to 39yrs of age and subclinical hypothyroidism was more common. But as per Bagcchi et al highest prevalence was noted in 45-54yrs of age group, which does not support this study, but the presence of hypothyroidism was more in this study then the study of Bagcchi et al.

As per the study conducted by Unnikrishnan et al in eight cities of India hypothyroidism prevalence was varied from 7% to 11% and subclinical hypothyroidism prevalence was 7 to 12%, but in our study the prevalence of subclinical hypothyroidism was more.[3] The difference in finding may be due to regional variation and food habit of the people.

Mean serum level of TSH was 8.68µIU/ml in subclinical hypothyroid patients and 63.792µIU /ml in hypothyroid patient. T3 and T4 level was in normal range but in hypothyroid patient it was less that is 72.83ng/dl and 2.96µg/dl respectively and this relation was statistically significant with P value 0.00001. So elevated TSH level is common finding in our study of this is supported by the study of Velayutham K et al conducted in South India.[9]

In present study we have observed that among hypothyroid patient relation between age and thyroid hormone profile was not significant statistically but TSH level was higher in younger age group then older one. Which is supported by the study of Hoogendoorn et al, but not corroborated by the study of Rebecca et al.[10,11]

Same trend of TSH level was found in subclinical hypothyroid patients also but regarding serum T3 level it was high in younger age group but lower in older age group but again this finding was not significant statistically. This finding of decrease in T3 level with age is supported by the study of Thenmalal et al and Ace Lipson.[12,13]

CONCLUSION

Author would like to conclude that in this post iodization period still hypothyroidism is common. In our study we have found that subclinical hypothyroidism is more common than hypothyroidism. Author have also found that thyroid disorder was more common in reproductive age group tribal women in east Godavari dist. of Andhra

Pradesh. An extensive study required for further detail evaluation of this problem.

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