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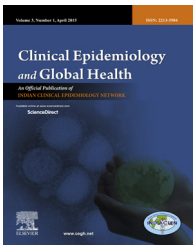

Original Article

An enumeration of the prevalence of hypothyroidism during pregnancy in central India

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ABSTRACT

Background/objective: Hypothyroidism can have adverse effects on pregnancy, such as miscarriage and congenital hypothyroidism. The routine assessment of thyroid function is not being done to date on all the pregnant women in India. Hence, the present study was designed to survey the antenatal thyroid status during the first trimester of pregnancy in a central Indian population.

Methods: The present study was performed on 1152 pregnant women with a mean age of 26.25 ± 4.39 years. All women were in the first trimester and were screened for their thyroid stimulating hormone (TSH) and Free T_4 level.

Results: Following the guidelines for the TSH and Free T_4 values in pregnancy, the prevalence of the hypothyroidism among the pregnant women in central India was 13.1%. Furthermore, the prevalence of clinical hypothyroid and subclinical hypothyroid was 2.25% and 10.85%, respectively.

Conclusion: The present data on the prevalence of hypothyroidism in pregnant women strongly recommend the inclusion of routine thyroid screening.

1. Introduction

Thyroid disorders are the second most common endocrinopathies found during pregnancy. The prevalence of hypothyroidism during pregnancy is estimated to be 0.3–0.5% for overt hypothyroidism and 2–3% for subclinical hypothyroidism. Thyroid autoantibodies are found in 5–15% of women in the childbearing age and are a risk factor for hypothyroidism during pregnancy and the postpartum period. Hashimoto thyroiditis is the most common cause.[1] A population survey conducted in 1991 showed that 2.5% of pregnant women have compensated hypothyroidism based on elevated thyroid stimulating hormone (TSH) levels.[2] A meta-analysis of 10 prospective studies of euthyroid women revealed that women with antithyroid antibodies were more than twice likely to experience a miscarriage (odds ratio 2.30, 95% CI 1.80–2.95).[3]

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There are very limited studies from India on thyroid disorders in pregnancy. Some studies based on Indian population showed the insufficiency of iodine in pregnant women.[4] A study from Mumbai, India, highlighted on the optimization of thyroid management in pregnancy and the improved neonatal outcomes associated with it.[5]

However, in many developing countries, routine assessment of thyroid status is not being done in all pregnant women. Furthermore, the incidence of subclinical hypothyroidism or autoimmune status in this population of women, especially women in South Asia or India is not properly enumerated due to lack of data.

The thyroid plays a key role in the fetal neural development, so the mother's thyroid status has to be within normal range during pregnancy. The present study was aimed to survey antenatal thyroid status during the first trimester of pregnancy in central India.

2. Materials and methods

The present study included 1152 pregnant women, who turned up from different parts of the central India to the Out Patient Department of Choithram Hospital and Research Centre, Indore, India, between February 2009 and March 2013. In this study, 257 (22.31%) subjects were from low income group (≤Rs.10,000 per month), 343 (29.77%) were from high income group (≥Rs. 40,000 per month) and the majority of the subjects, 552 (47.92%) were from middle income group (>Rs. 10,000 to <Rs. 40,000 per month). The study subjects were between 18 and 39 years with the mean age of 26.25 (±4.39) years. Known cases of thyroid disorders were excluded from this study. The study proposal was reviewed by the hospital Ethical Committee, which has guidelines based on Helsinki declaration.

All the subjects visited at the Out Patient Department (OPD) of Choithram Hospital and Research Centre, Indore, India, during the first trimester of their pregnancy, were included in this study; and screened for their TSH and Free T_4 levels. Other than biochemical thyroid assessment, pregnancy profile included hemoglobin, urea, creatinine, random blood glucose, HIV, HBsAg, Rubella Antibody, and routine urine examination.

Pelvic examination and ultrasound examination were done. Details of pregnancy regarding gestational age, weight gain and menstrual history were recorded. Features suggestive of hypothyroidism, such as family history of thyroid disorders, previously diagnosed thyroid disease, presence of thyroid therapy, skin changes associated with hypothyroidism (cold skin, coarse skin), presence of goiter, slow movements, periorbital puffiness and delayed ankle reflex were looked for.

General physical examination including height and weight measurements was also done for all. Body mass index (BMI) was calculated for all the subjects. The normal range of BMI lies between 18.5 and 24.9 kg/m^2. BMI range between 24.9 kg/m^2 and 30 kg/m^2 were considered as overweight, whereas more than 30 kg/m^2 was considered as obese.[6]

TSH and Free T_4 were assayed using Abbott Architect i1000SR (Abbott Laboratories, Diagnostics Division, Abbott Park, IL, USA) analyzer based on a Chemiluminescent Microparticle Immunoassay (CMIA) for the quantitative determination of TSH (Architect TSH assay was designed to have a precision of ≤10% total CV and the assay was designed to have a functional sensitivity of ≤0.01 μLU/ml, which meets the requirements of a third generation TSH assay) and Free T_4 (The Architect Free T_4 assay was designed to have a precision of ≤10% total CV and the assay was designed to have an analytical sensitivity of ≤0.4 ng/dl).[7] The guidelines for the pregnant women, suggested that TSH should be less than 2.5 μIU/ml in the first trimester and hence was considered as cut off value for TSH in the present study.[8] Whereas the normal range of the Free T_4 was considered as 0.7–1.48 ng/dl.

The data collected were analyzed using Excel 2007, R2.8.0 Statistical Package for Social Sciences (SPSS) for windows version 16.0 (SPSS Inc.; Chicago, IL, USA).

3. Results

Out of total 1152 subjects screened, 1101 (95.58%) had serum TSH levels within normal range with a mean TSH value of 1.96 ± 1.2 μIU/ml. On the contrary 26 subjects (2.25% of the total study population) had clinical hypothyroidism with a higher mean TSH value of 26.87 ± 6.51 μIU/ml with decreased value of Free T_4 with the mean of 0.53 ± 0.03 ng/dl and 125 subjects (10.85% of the total study population) had a mean TSH value of 7.43 ± 1.2 μIU/ml and Free T_4 values in normal range (mean value of 0.94 ± 0.16 ng/dl), considered as subclinical hypothyroidism (Fig. 1).

Out of these 26 clinical hypothyroid subjects, 20 (76.9%) were obese and rest of 6 (33.9%) were overweight. On the other

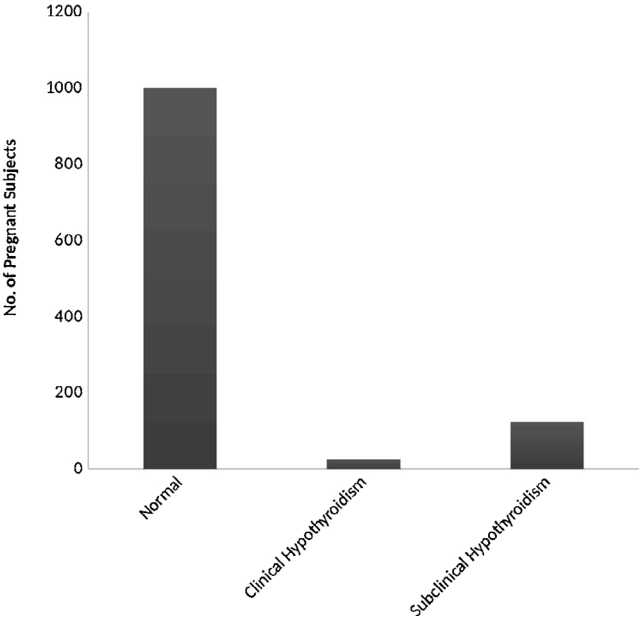

Fig. 1 – A graphical presentation of the thyroid status during first trimester of pregnancy in central India (normal = 1001, clinical hypothyroidism = 26 and subclinical hypothyroidism = 125).