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Targeted case finding vs. global thyroid screening in pregnancy

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Abstract
Background and objectives: To back up the need for routine prenatal thyroid screening. To count the number of people who suffer from undetected thyroid diseases. Study the outcomes for people with thyroid disorders who receive adequate and inadequate treatment.
Method: From January 2021 to November 2021, during the first antenatal visit, 350 pregnant patients with singleton gestation participated in the study at Department of OBG, Dr Patnam Mahender Reddy Institute of Medical Sciences, Chevella, Telangana, India. All participants in the study provided their written consent. Patients with known hypothyroidism or hyperthyroidism were simultaneously excluded from the analysis.
Result: 15.7% of people have thyroid problems. The 95% confidence interval (CI) indicates that the incidence may range from 13.21% to 16.79%. We may also say that 1 out of every 7 women who were examined had abnormal thyroid dysfunction.
Conclusion: This study may lead us to draw the conclusion that routine thyroid screening, which misses many individuals, is considerably preferable to targeted case discovery. Individuals with an abnormal thyroid profile had problems more frequently than participants with a normal thyroid profile. Hence, I n a nation where thyroid cancer is prevalent, widespread screening ought to be promoted.

Keywords: Thyroid, pregnancy, TSH, FT3, FT4

Introduction
Both the role of the thyroid gland and the impact of thyroid disorders on fetal and maternal growth have received increased attention in recent years. Pregnancy-related thyroid abnormalities are the second most frequent endocrinological condition. Incidence of hypothyroidism during pregnancy varies greatly between regions. The rates might be as low as 2.5% in the West and as high as 11% in India [1, 2, 3].
Some expert panels have recommended routine thyroid screening because of the negative effects of maternal thyroid disorders on children and the evident benefits that medication can give. In contrast, the Endocrine Society's clinical practice recommendations advise a case-finding strategy, wherein only potentially at-risk women are tested. Those with a personal or family history of a medical ailment, such as hypothyroidism, diabetes mellitus type 1, or any other, are included here [4, 5, 6].
Dhanwal and coworkers discovered a significant prevalence of hypothyroidism in their recent investigation. (14.3%) Based on these results, I set out to determine if high-risk screening offers more value to our country than standard screening practices. Available data suggests that subclinical hypothyroidism is associated with a number of adverse outcomes for both mother and child, including spontaneous miscarriage, hypertension, abruption, premature birth, and impaired cognitive and psychomotor development [7, 8, 9].
The screening yield and value are affected by the criteria used and the threshold selected, as well as the size of the population being screened. Therefore, the threshold should be modified to account for values that are specific to each trimester. In the event that the mother suffers from hypothyroidism during the first trimester of pregnancy, it may have a negative impact on the brain development of the embryo. Neurodevelopmental delay cannot be reversed by treatment after the first trimester; therefore, these challenges can be prevented by performing universal screening and beginning appropriate treatment at that time. The mother's thyroid hormones continue to play a crucial role in the fetus's neurodevelopment, just as they did in the first trimester [10, 11].

A shortage of iodine in the diet, autoimmune thyroiditis, treatment with radioactive iodine, and surgical removal of the thyroid gland are all potential causes of hypothyroidism. Hyperthyroidism is extremely rare in pregnancy, affecting less than 1 in every 1,000 expectant mothers at most. Subclinical hyperthyroidism does not affect fertility or pregnancy outcomes. Therefore, hypothyroidism screening is the key concern [11, 12].

Material and Methods

During the period of January 2021 to November 2021, 350 pregnant patients with singleton pregnancies were enrolled in the prospective study at Department of OBG, Dr Patnam Mahender Reddy Institute of Medical Sciences, Chevella, Telangana, India. All study participants provided written informed permission. Patients who were already diagnosed with hypothyroidism or hyperthyroidism were also excluded.

Inclusion criteria

1. Those who are willing to return for follow-up appointments after their initial booking visit during the first trimester of pregnancy at GTMCH.
2. Patients who are at a higher risk include those who are obese, have had multiple abortions, have used an IUD in the past, or have been trying to conceive for a long time.

Exclusion criteria

1. Individuals diagnosed with a thyroid condition Reluctant patients who refuse to return for checkups Moms-to-be who are carrying molars

Methodology

At the time of enrollment, participants provided written informed consent, were asked in-depth questions about their medical history, underwent a thorough general physical examination, and had their results recorded on a standard form.
During the initial consultation, we checked their TSH and free T4. An early morning venous sample was taken from subjects who had fasted overnight. All patients were given a thyroid function test, and the results were recorded and analyzed to classify them as having normal thyroid function, overt hypothyroidism, overt hyperthyroidism, or subclinical hypothyroidism/hyperthyroidism, whereupon treatment was started. The next step is to assess the patient population for the presence of risk factors for thyroid dysfunction; those patients who exhibit risk characteristics are classified as high risk, while those who do not are classified as low risk. It was examined whether or not screening only high-risk populations, as opposed to universal screening, is sufficient given the prevalence of thyroid dysfunction in both groups.
Abortions, abruption, premature birth, low birth weight, fetal neonatal death, and birth weight data were gathered. It was recorded how many complications occurred in both the well-treated and poorly-treated groups. Chi-square test was used to analyze the statistical significance of the variables' differences (p value)

Results

Table 1: Thyroid Profile

Thyroid status	No. of women	%
Normal	300	85.0%
Abnormal	50	15.0%
Total	350	100.0

Table 2: Types of Thyrod Dysfunction

Types	No. of women	%
Subclinical hypothyroidism	32	58.3%
Subclinical hyperthyroidism	5	9%
Overt hypothyroidism	15	27.3%
Overt hyperthyroidism	3	5.4%
Total	55	100.0

Table 3: Thyroid Risk Status

Risk status	No. of women	%
With Risk factors	35	63.6%
Without Risk factors	20	36.4%
Total	55	100.0

The significance level of the chi-square test was less than 0.001, with a value of 247.334. Accordingly, if we only rely on targeted high-risk screening, we risk missing a sizable proportion of patients.

Table 4: Level of TSH

Types	No. of women	%
<0.10 ng/ml	6	1.7%
0.1 - 3.0 ng/ml	310	88.5%
3 - 5 ng/ml	12	3.4%
> 5 ng/ml	22	6.2%
Total	350	100.0

Table 5: Complications

Complication	No. of women	%
Yes	55	15.8%
No	295	84.2%
Total	350	100.0

Table 6: Thyroid status

	Thyroid status				Chi square test
	Abnormal thyroid profile		Normal thyroid profile		
	n	%	n	%	
Missed Abortion	2	10%	0	0.0%	
PIH	4	20%	6	17.2%	
IUGR	3	15%	0	0.0%	
Oligohydramnios	5	25%	6	17.2%	$\chi 2=16.47$
Preterm	3	15%	11	31.4%	
Abruption	2	10%	2	5.7%	P=0.05*(S)
IUD	1	5%	3	8.5%	
GDM	0	0.0%	5	14.3%	
Polyhydramnios	0	0.0%	2	6%	
Total	20	100.0%	35	100.0%	

Patients with an aberrant thyroid profile are more likely to experience complications than those with a normal thyroid profile, as indicated by the chung value of 16.47 and the p value of 0.05.

Table 7: Treatment Among Complication

Treatment	No. of women	%
Adequate	4	20%
Not adequate	16	80%
Total	20	100.0

Statistically, this is a significant finding; the chi-square test yielded a value of 28.3129, and the p-value was less than 0.001. Which suggests that patients who were not given proper care were more likely to experience difficulties.

Table 8: TSH and FT3

			TSH		Total
			Normal	Abnormal	
FT3	Total	Normal	285	12	297
		Abnormal	45	8	53
			330	20	350

Table 9: TSH and FT4

			Abnormal thyroid profile		Total
			Normal	Abnormal	
FT4	Total	Normal	289	15	304
		Abnormal	41	5	46
			330	20	350

Table 10: Birth weight

	No. of babies	%
<2.5 kg	9	2.6%
2.5 -3.0 kg	162	46.3%
3.0 -4.0 kg	180	51.1%
Total	350	100.0

Table 11: Birth weight and Abnormal Thyroid profile

Birth weight	Abnormal thyroid profile				Chi square test
	Normal		Abnormal		
	n	%	n	%	
<2.5 kg	6	1.8%	2	20%	$\chi 2=0.81$
2.5 -3.0 kg	154	46%	8	40%	P=0.66 (NS)
3.0 -4.0 kg	170	51.6%	10	50.0%	
Total	330	100.0%	20	100.0%	

Table 12: Gestational Age

GA	No. of women	%
36 weeks	20	5.7%
37 weeks	6	1.7%
38 weeks	25	7.1%
39 weeks	130	37.1%
40 weeks	169	48.3%
Total	350	100.0

Table 13: Obstetrical Code

	No. of women	%
Primi	227	64.8%
G2P1L1	62	17.7%
G2A1	37	10.5%
G3P2L0	11	3.1%
G3P2L1	5	1.4%
G3A2	3	0.8%
G4P3L3	2	0.57%
G2P1L0	2	0.57%
G3P2L2	1	0.3%
Total	350	100.0

Table 14: Age Distribution

Age	No. of women	%
< 20 years	55	15.7%
21 -25 years	134	38.3%
26 -30 years	125	36%
> 30 years	36	10.3%
Total	350	100.0

Mean age women =25.33 years and Standard deviation=4.37 years

Table 15: Age Group and Thyroid Profile

Age	Abnormal thyroid profile				Chi square test
	Normal		Abnormal		
	n	%	n	%	
< 20 years	50	15.3%	2	10%	$\chi 2=15.36$ P=0.01**
21 -25 years	145	43.2%	4	20%	
26 -30 years	110	33.2%	6	30%	
> 30 years	25	8.2%	8	40%	
Total	330	100.0%	20	100.0%	

Table 16: Prevalence of Thyroid Dysfunction

Total screened	Thyroid abnormal	% of abnormality	95% Confidence interval
350	55	15.7%	13.21% -16.79%

There is a 15.7% incidence rate of thyroid dysfunction. The 95% confidence interval reveals that the incidence can range from a low of 13.21% to a high of 16.79%. Additionally, we can say that one out of every seven cases of women being checked has aberrant thyroid dysfunction.

Discussion

This means that roughly one-third of pregnant women with severe thyroid abnormalities would be missed by the technique for identifying high-risk cases of thyroid dysfunction. Similarly to a prior study by Vaidya and colleagues, my investigation produced the same conclusions. In 2012, as a result of updated recommendations from the Endocrine Society, the maximum allowable level of TSH was lowered from 0.5 to 0.1mIu/L.

This study's mean gestational age was also nine weeks, matching that of the Dave *et al*. research. When comparing the studies of Nazourpur *et al*. (353 participants) and Dave *et al*. (305 participants), the numbers are quite similar. Three hundred and fifty pregnant women participated in this study. Vaidya and coworkers analyzed information on 1560 people in their study [12, 13].

It is still up for debate whether or not all pregnant women should be checked for thyroid issues. However, the low cost of therapy and the widespread availability of screening tests are making the universal screening strategy more popular, despite the lack of data showing that discovering and treating pregnant women who have subclinical hypothyroidism is healthier for the mother and the baby. Despite the lack of proof that treating pregnant women with subclinical hypothyroidism improves outcomes for both mother and child, this is still the case.

Our findings suggest that roughly 32.3 percent of individuals with subclinical hypothyroidism, 43.8 percent of those with overt hypothyroidism, and 25 percent of individuals with hyperthyroidism are missed by case finding. Approximately 43.8% of persons with overt hypothyroidism are missed by case discovery when putative risk factors for thyroid illness are used. Consistent with the results of the research done by Vaidya and coworkers [13, 14].

This study's average age of participants was 24, which was much lower than the average ages of participants in the studies of Ohashi *et al*. (30.8+44.7 years) and Rajesh *et al*. (28.412.2 years) (23.79 years). This study shows that there are a lot of undiagnosed thyroid problems in pregnant women. These differences may also be influenced by regional differences in iodine amounts. Goiters were more common in areas with an extreme lack of iodine, hence more women in those areas met the criteria for the case-targeted high-risk case discovery strategy. Dhanwant and colleagues found that 14.3% of women who went to a tertiary hospital in Delhi had hypothyroidism, with the vast majority of those cases being subclinical. As far as I could tell, the figure was 12.5 percent. Subclinical hypothyroidism was discovered to affect 2.8% of the population of Andhrapradesh in the study conducted by Bandela *et al*. Subclinical hypothyroidism was reported to affect 2.8% of study participants, according to Gayathri and coworkers [14, 15].

Fewer people were impacted by hyperthyroidism than hypothyroidism. Hyperthyroidism with outward symptoms is rather uncommon. Results from Prince *et al* research. on Asian women found that it occurred only 0.02% of the time, which is quite close to the results of my own study, which suggested that it occurred only 1% of the time. Thyroid problems were associated with numerous risk factors and this association was statistically significant (p 0.001). In comparison to patients with normal thyroid profiles, those with abnormal thyroid profiles were more likely to experience unfavorable outcomes (p 0.001). The results I found jived with those found by Negro *et al*. and Vaidya *et al*., as well as those found by Dave *et al*. in Madhya Pradesh. No one can agree on which potential dangers should have been considered in developing a case-finding method. There is not enough evidence to prove that age and abnormal thyroid function are associated, despite the fact that age under 30 is listed as a risk factor and all women over the age of 30 should be examined by the American Thyroid Association and European societies. Age under 30 is cited as a risk factor by both the American Thyroid Association and European societies' guidelines. Finding pregnant women increased from 55.3% to 85.6% when the case-finding strategy expanded its target demographic to include women older than 30 years of age. Thyroid screening procedures should be based on the facts specific to each country and civilization due to the wide variation in the incidence of these risk factors across geographical regions [16, 17].

The current study indicated that about one-third of pregnant women with thyroid dysfunction (35.6%) were being missed due to a lack of screening because of the low number of risk factors among pregnant women in South India. This is what the research indicates. However, most patients with subclinical thyroid issues (34.4%, n=174) went undiagnosed. In regards to what happens when these women are treated, there is scant information accessible, and some of it seems to contradict itself. Subclinical hypothyroidism has been linked to pregnancy complications, and some studies have found that L-thyroxine (L-T4) medication can reduce or eliminate these risks. However, other research has found that L-T4 treatment had no effect on reducing or eliminating these risks. According to the findings of this study, some of the risk factors for thyroid malfunction include advancing age, having more than one abortion, and having a family history of thyroid issues. Thyroid dysfunction can also be strongly indicated by the presence of symptoms associated with thyroid problems. Women who had experienced many abortions during pregnancy had a higher risk of developing thyroid disorders compared to women who had not experienced this risk. People who had a history of thyroid disorders in their family were more likely to have thyroid problems themselves than people who did not have such a history [18, 19].

My research was most successful because I conducted it primarily with Indian pregnant women who were in their first trimester of pregnancy. This was the study's primary advantage. Everyone who participated in the research was given a comprehensive evaluation of their thyroid function. This evaluation consisted of taking their medical history, performing a physical exam, and performing thyroid function tests. In some of the other trials, the researchers did not administer these examinations to each and every participant in the study. The findings of our research, however, are not reliable enough to be utilized to forecast what will occur in other locations that have varying iodine concentrations or other risk factors [19, 20].

On the other hand, there are a few studies that make the argument for not screening absolutely everyone. There have only been two studies done thus far, and they both came to different conclusions. According to the findings of the research carried out by Negro *et al*., there was no discernible difference in the number of unfavorable outcomes experienced by those who received either universal or selective screening. However, when women who were experiencing thyroid issues during pregnancy were recognized and treated, they had fewer negative impacts than women who were experiencing thyroid issues but were not found and treated. According to the findings of the

study by Lazarus *et al*., treating those who had subclinical hypothyroidism did not improve these individuals in any way. However, the research carried out by Pope *et al*. revealed that the neuropsychological performance of children whose mothers' free T4 levels were less than 10 TSH was lower than that of children whose mothers' free T4 levels were greater than 10 TSH [20, 21].

The targeted high-risk case discovery strategy most likely overlooked approximately one third of pregnant women who had thyroid insufficiency. This is the conclusion that can be drawn from the preceding statement. When one considers how simple and cost-effective therapy is, as well as how simple it is to obtain a screening test, the idea of universal screening for thyroid problems during pregnancy seems like a smart one to implement. It is now not possible to recommend treating subclinical hypothyroidism since we do not know for certain how doing so would effect the infant; nevertheless, if there were sufficient resources, it would be possible to carry out the procedure. The targeted high-risk case finding technique will be revealed to be useless if continuing prospective trials show that treating subclinical hypothyroidism in pregnancy is effective. This is especially true in populations where putative risk factors are not common. However, in countries like India, where there are a large number of individuals with thyroid disorders and the government provides free testing and treatment for thyroid problems, it is possible for our government institutions to recommend it and even carry it out [21, 22].

Conclusion

Based on the findings of this study, we might draw the conclusion that universal thyroid screening is superior to targeted case discovery, which overlooks a significant number of individuals. A Thyroid profile that is abnormal is found in one third of individuals. Individuals who had a thyroid profile that was abnormal were more likely to experience complications than those patients who had a normal thyroid profile. It is possible to diagnose and treat thyroid dysfunction, which will improve the outcomes for both the mother and the newborn. In addition to that, the price of the treatment is manageable. Hence

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Conflict of interest

Nil

References

1. Leon Speroff MD, Marc Fritz A. Clinical Gynaecology and infertility, 7 edition, Lippincott Williams & Wilkins, Philadelphia, 815p.
2. Sejekan Prema J. Obstet Gynecol India 2010 May-June;60(3):232-237 ACOG practice bulletin on thyroid disease in pregnancy. No: 32 Nov 2001 issue. Am Fam Physicians 2001 May 15;65(10):2158-2162
3. The journal of clinical endocrinology and metabolism. J. Clin Endocrinol Metab: 92/8 (supplement) S1-S47, 2007. Management of thyroid dysfunction during pregnancy and postpartum: An endocrine society clinical practise guideline
4. Cleary-Goldman J, Malone FD, Lambert-Messerlian G, Sullivan L, Canick J *et al*., Maternal thyroid hypofunction and pregnancy outcome. Obstet Gynecol. 2008 Jul;112(1):85-92.
5. ACOG Committee Opinion Number, 381, 2007, Oct.
6. Morreale de Escobar G, Obregon MJ, Escobar del Rey F. Role of thyroid hormone during early brain development. Eur J Endocrinol. 2004;151(suppl 3):U25-37.
7. Lavado-Autric R, Auso E, Garcia-Velasco JV *et al*. Early maternal hypothyroxinemia alters histogenesis and cerebral cortex cryoarchitecture of the progeny. J Clin Invest. 2003;111:4037-4047.
8. Roberts CG, Ladenson PW. Hypothyroidism. Lancet. 2004;3:793-803.
9. Helfand M. Screening for subclinical thyroid dysfunction in nonpregnant adults: A summary of the evidence for The US Preventive Services Task Force. Ann Intern Med. 2004;140:128-141.
10. Krassas GE. Thyroid disease and female reproduction. Fertil. Steril. 2000;74:1063-1070
11. Wang C, Crapo LM. The epidemiology of thyroid disease and implications for screening. Endocrinol. Metab. Clin. North Am. 1997;26:189-218.
12. Brent GA. Maternal thyroid function: interpretation of thyroid function tests in pregnancy. Clin Obstet Gynecol 1997;40:3-15
13. Vaquero E, Lazzarin N, De Carolis H. Mild thyroid abnormalities and recurrent spontaneous abortion: diagnostic and therapeutic approach. Am J Reprod Immunol. 2000;43:204-208.
14. Pratt D, Novotny M, Kaberlein G. Antithyroid antibodies and the association with non-organ specific antibodies in recurrent pregnancy loss. Am J Obstet Gynecol. 1993;168:837-41.
15. Healy DL, Trounson AO, Andersen AN. Female infertility: causes and treatment. Lancet. 1994;18:1539-1544.
16. Matsua K, Kaberlein G, Burrow G. Spontaneous pregnancy termination and thyroid abnormalities. Hum Reprod. 2000;15:163-79
17. Thompson CC, Potter GB. Thyroid hormone action in neural development. Cereb Cortex. 2000;10:939-45.
18. Sharma PP, Mukhopadhyay P. Mukhopadhyay A. *et al*. Hypothyroidism in pregnancy. J Obstet Gynecol India 2007;57:331-334.
19. Ayala AR, Wartofsky L. The case for more aggressive screening and treatment of mild thyroid failure. Cleve Clin J Med. 2002;69:313-20
20. McGregor AM, Hall R, Richards C. Autoimmune thyroid disease and pregnancy. Br Med J. 1984;288:1780-1
21. Spong CY. Subclinical hypothyroidism: should all pregnant women be screened? Obstet Gynecol. 2005;105:235-6.
22. Brown RS, Bellisario RL, Botero D *et al*. Incidence of transient congenital hypothyroidism due to maternal thyrotropin receptor-blocking antibodies in over one million babies. J Clin Endocrinol Metab. 1996;81:1147.