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Original Research Article

A Hospital-Based Study Assessing the Thyroid Disorders Prevalence in Women during Reproductive Age

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Conflict of interest: Nil

Abstract:

Aim: The present study was undertaken to assess the thyroid disorders prevalence in women during reproductive age.

Material & Methods: The study recruited 100 reproductive women of the age group of 18-45 years. Informed consent was obtained from all the participants and confidentiality of data was maintained. All participants underwent thorough physical examination. All measurements were performed using standard methods in the literature.

Results: The disorder was more common in age group 40 years and older accounting for 47%. AUB was more common amongst multiparous woman contributing to 58%. The most common menstrual disorder pattern seen in AUB was menorrhagia which was 52%. Next commonest was polymenorrhea at 22%. Euthyroid, hypothyroid and hyperthyroid were 88%, 8% and 4% respectively. Majority of the hypothyroid cases were in age group >40 years accounting to 50%. The highest number of hyperthyroid cases was in age group of 21-30 years. More number of hypothyroid cases were in >40 years age group and a smaller number of cases in <20 years age group. There was high association observed between age groups and thyroid type and it is found statistically significant ($p<0.001$).

Conclusion: The study results suggested that there was a strong association between the thyroid disorders and the reproductive functions in the women of reproductive age. The study recommends further detailed studies in this area for further understanding the relationship and to plan effective treatment strategies.

Keywords: Thyroid Disorders, Reproductive Women, Endocrine Disorders.

Introduction

Thyroid gland is major endocrine gland situated in the neck and weighs about 20 grams in an adult as it regulates not only the metabolic functions but also the reproductive functions. [1] It secretes two major hormone, thyroxin and triiodothyronine, which are controlled by thyroid stimulating hormone secreted by anterior pituitary. It is known to be one of the most versatile hormone which has important functions such as cell differentiation, body growth, basal metabolism and reproductive physiology. [2] Thyroid gland controls gonads by a combination of direct metabolic effect as well as excitatory and inhibitory control of gonads through gonadotropins and prolactin from anterior pituitary. [2]

Disorders of thyroid hormone are on raise in Indian women. It may be due to high level of stress or change in the lifestyle. Detection of these disorders in early stage is much helpful for adequate management. [3] Thyroid dysfunction can affect fertility in various ways resulting in anovulatory cycles, luteal phase defect, high prolactin (PRL) levels, and sex hormone imbalances. [4] Therefore, normal thyroid function is necessary for fertility, pregnancy, and to sustain a healthy pregnancy, even in the earliest days after conception. Infertility affects 10-15% of couples at reproductive age. [5] The causes of infertility in the female are however related to both the physical and biochemical challenges relating to the function of gonads and these biochemical challenges are caused by hormonal absence, insensitivity, and inaction in the pituitary-gonad axis with resultant failure of ovulation accounting for as many as half (16%) of the causes in female infertility. [6]

The ovaries are in continuous interaction with the sex hormones and the interplay may account for infertility in several ways. Hypergonadotropic hy-

pogonadism is the most common biochemical pattern in both primary and secondary infertility, while hypogonadotropic hypogonadism is more associated with secondary infertility but hyperprolactinemia is less common in both types of infertility. [7] However, the other pituitary hormones such as the thyroid and prolactin hormones can interact with the ovaries in women of reproductive age resulting in a direct effect on ovarian function, autoimmunity mechanism as well as alterations of the sex hormone binding protein levels. [8] Delayed puberty, precocious puberty, menstrual disturbances and infertility have been observed in association with thyroid disorders. [9] Hypothyroidism can cause AUB, including menorrhagia. Hyperthyroidism can result in oligomenorrhea or amenorrhea. [10,11] Treatment of hypothyroidism in women is an important part of any effort to correct infertility and it is therefore imperative to put into consideration the serum TSH assessment when requesting an infertility test.

Hence, the present study was undertaken to assess the thyroid disorders prevalence in women during reproductive age.

Material & Methods

An Observational study including 100 reproductive women of the age group of 18-45 years was conducted in the Department of Obstetrics and Gynecology, Patna Medical College and Hospital, Patna, Bihar, India for one year. Informed consent was obtained from all the participants and confidentiality of data was maintained. Written informed consent was obtained from all the parents of the participants before the commencement of the study

Exclusion Criteria

- All pregnant women, infertile women on hormonal therapy, women presenting with infertility due to male factors, those with congenital anomalities of the female urogenital tract, those with a history of thyroid disease/surgery, and those treated with thyroid medication or irradiation were excluded from the study
- Patients with severe complications were excluded from the study.
- Unwilling participants were excluded from the study.
- Women undergoing any endocrine therapy or treatment were also excluded.

Methodology

The participants comprised 50 recruited by stratified random sampling method after a computer-generated random number into primary and secondary infertility.

The control group of 50 participants was made up of women in the community who had delivered between three months to one year before the time of the study

All participants underwent thorough physical examination. A blood sample of 5 milliliters was collected from each participant using plain vacutainer bottles from the antecubital fossa under aseptic conditions. The samples were allowed to clot and retract at room temperature for four hours before being centrifuged at 5000 rpm for five minutes and the separated sera were harvested and stored at -20 °C until analysis.

Serum freeT3 (fT3), feeT4 (fT4), and TSH were analyzed using commercial ELISA kits. The reference intervals in the laboratory of assay included: 0.39-6.16 mIU/L for TSH, for FT3 was2.15- 6.45 pmol/L for, and 10.30-25.78 pmol/L for FT4.

The diagnosis of euthyroid was made as serum TSH, FT3, and FT4 concentrations within the reference interval while overt hypothyroidism was made as serum TSH concentration above the reference interval and FT3, and FT4 concentrations below the reference interval.

Subclinical hypothyroidism and Subclinical hyperthyroidism were defined as serum TSH concentration above the reference interval and FT3, FT4 concentrations within the reference interval and serum TSH concentration below the reference interval and the FT3, FT4 concentrations within the reference interval respectively.

Overt hyperthyroidism was defined as serum TSH concentration below the reference interval and FT3, and FT4 concentrations above the reference interval, and overt hypothyroidism was defined as serum TSH concentration above the reference interval and FT3, and FT4 concentrations below the reference interval. All instruments used were validated.

Information related to the patients was kept confidential.

Statistical analysis:

The statistical software SPSS 20.0 version was used to analyze the data. Data was presented as frequency and percentage.

Results

Table 1: Demographic data

Age group	Frequency	Percentage
<20	18	18%
21-30	7	7%
31-40	28	28%
>40	47	47%
Total	100	100%
Parity		
Nullipara	20	20%
Primipara	22	22%
Multipara	58	58%
Total	100	100%
Compliant		
Menorrhagia	52	52%
Polymenorrhea	22	22%
Oligomenorrhea	13	13%
Hypomenorrhea	13	13%
Total	100	100%

The disorder was more common in age group 40 years and older accounting for 47%. AUB was more common amongst multiparous woman contributing to 58%. The most common menstrual disorder pattern seen in AUB was menorrhagia which was 52%. Next commonest was polymenorrhea at 22%.

Table 2: Distribution of thyroid disorders in participants

Thyroid status	Frequency	Percentage
Euthyroid	88	88%
Hypothyroid	8	8%
Hyperthyroid	4	4%
Total	100	100%

Euthyroid, hypothyroid and hyperthyroid were 88%, 8% and 4% respectively.

Table 3: Age and thyroid status

Age	Euthyroid		Hypothyroid		Hyperthyroid		Total
	No.	%	No.	%	No.	%	
<20	16	18.18	1	12.5	1	25	18
21-30	5	5.68	1	12.5	1	50.0	7
31-40	25	28.40	2	25	1	27.8	28
>40	42	47.72	4	50	1	5.6	47
Total	88	100.0	8	100.0	4	100.0	100

Majority of the hypothyroid cases were in age group >40 years accounting to 50%. The highest number of hyperthyroid cases was in age group of 21-30 years. More number of hypothyroid cases were in >40 years age group and a smaller number of cases in <20 years age group. There was high association observed between age groups and thyroid type and it is found statistically significant ($p<0.001$).

Discussion

Abnormal uterine bleeding (AUB) is one of the most common gynecological complaint representing many underlying clinical conditions. It affects nearly affects 9-14% of woman between menarche to menopause, thereby affecting the quality of life and causing economic burden. [12] PALM-COEIN is a useful acronym provided by FIGO, 2018 to classify etiology of abnormal uterine bleeding (AUB). 1st portion describes structural disorders and second part describes non-structural disorders. [13] Thyroid disorders are more common in women than in men. Also, the female reproductive system is more closely associated with female reproductive system than male as evidenced by goitrous enlargement during menarche, pregnancy and menopause. Delayed puberty, precocious puberty, menstrual disturbances and infertility have been observed in association with thyroid disorders. [14] Thyroid dysfunction, both hypothyroidism and hyperthyroidism can be associated with abnormal uterine bleeding. The earliest association of thyroid disorder with menstrual disturbance was noted by Basedov in 1840. He observed association of amenorrhea with hyperthyroidism. Hypothyroidism can cause AUB, including menorrhagia. Hyperthyroidism can result in oligomenorrhea or amenorrhea. [15,16]

The disorder was more common in age group 40 years and older accounting for 47%. AUB was more common amongst multiparous woman con-

tributing to 58%. Euthyroid, hypothyroid and hyperthyroid were 88%, 8% and 4% respectively. Majority of the hypothyroid cases were in age group >40 years accounting to 50%. The cases of thyroid dysfunction are on rise worldwide. [17] In India also the same is observed for which there may be multiple causes like family history or lifestyle modifications or excess of stress. [18] Earlier studies reported that there was more cases of hypothyroidism and sub clinical hypothyroidism in the women of reproductive age. [19] The present study confirms the views as we have observed more cases of hypothyroidism when compared with hyper thyroidism. Further, in context of parity, it was reported that those with primi and multi parous were exhibited more thyroid dysfunction. [20] The most common menstrual disorder pattern seen in AUB was menorrhagia which was 52%. Next commonest was polymenorrhea at 22%. Verma A et al [21] and Jinger SK et al [22] had similar observations. This is probably related to anovulation that occurs in hypothyroidism.

The highest number of hyperthyroid cases was in age group of 21-30 years. More number of hypothyroid cases were in >40 years age group and a smaller number of cases in <20 years age group. There was high association observed between age groups and thyroid type and it is found statistically significant ($p<0.001$). It was noticed in many studies mentioned before and including this study, the incidence of AUB in more towards perimenopause and hypothyroidism is frequent in older woman in general population, which includes perimenopausal period. This justifies screening for thyroid profile even in asymptomatic older woman. It is recommended to screen with S. TSH assay every 5 years beginning at 35, then every 2 years after 60 years. [23]

Conclusion

The study results suggested that there was a strong association between the thyroid disorders and the reproductive functions in the women of reproductive age. The study recommends further detailed studies in this area for further understanding the relationship and to plan effective treatment strategies.

References

1. Rekha B, Rani AS. An Analysis of Histopathological Findings in women with Postmenopausal Bleeding in A Tertiary Care Hospital. IOSR J Dent Med Sci 2016;15:1-12
2. Rhoades RA, Bell DR. Medical physiology, principles of clinical medicine 4th edition: Wolters Kluwer/ Lippincott, Williams and Wilkins; 2013;621- 631
3. Taylor HS, Pal L, Sell E. Speroff's clinical gynecologic endocrinology and infertility. Lippincott Williams & Wilkins; 2019 Jul 11.
4. Verma I, Sood R, Juneja S, Kaur S. Prevalence of hypothyroidism in infertile women and evaluation of response of treatment for hypothyroidism on infertility. International journal of applied and basic medical research. 2012 Jan;2(1):17.
5. Poppe K, Velkeniers B, Glinoer D. The role of thyroid autoimmunity in fertility and pregnancy. Nature clinical practice Endocrinology & metabolism. 2008 Jul;4(7):394-405.
6. Unuane D, Tournaye H, Velkeniers B, Poppe K. Endocrine disorders & female infertility. Best Practice & Research Clinical Endocrinology & Metabolism. 2011 Dec 1;25(6):861-73.
7. Akande AA, Idowu AA, Jimoh AK. Biochemical infertility among females attending University of Ilorin teaching hospital, Nigeria. Nigerian Journal of Clinical Practice. 2009;12(1).
8. Rijal B, Shrestha R, Jha B. Association of thyroid dysfunction among infertile women visiting infertility center of Om Hospital, Kathmandu, Nepal. Nepal Med Coll J. 2011 Dec 1;13(4):247-9.
9. Oumar K, Jessie DC, Peterson M. Endocrine disorders: Berek and Novak's Ggynecology. 15th Ed. Philadephia. Lipincott Williams and Wilkins; 2012:1066-1123.
10. Von Basedow CA. Exophthalmus durch Hypertrophie des Zellgewebes in der Augenhohle. Wchenscher Heilkunde. 1840; 6:197-202.
11. Hillard PJA. Benign diseases of the female reproductive tract. Berek and Novak's Gynecology.15th Ed. Philadephia. Lipincott Williams and Wilkins; 2012:374-431.
12. Fraser IS, Langham S, Hochgraeber K. Health related quality of life and economic burden of abnormal uterine bleeding. Expert Review Obstet Gynaecol. 2009:4(2):179-89.
13. Munro MG, Critchley, Fraser IS, Figo. Menstrual disorders committee. The two figo systems for normal and abnormal uterine bleeding symptoms and classification of causes of abnormal uterine bleeding in the reproductive years: 2018 revisions. Int J Gynaecol Obstet. 2018;143(3):393-408.
14. Oumar K, Jessie DC, Peterson M. Endocrine disorders: Berek and Novak's Ggynecology. 15th Ed. Philadephia. Lipincott Williams and Wilkins; 2012:1066-1123.
15. Von Bosedov CA. Exopthalmous durch Hypertrophie des Zellgewebes in der Augenhohle. Wchenscher Heilkunde. 1840; 6:197-202.
16. Hillard PJA. Benign diseases of the female reproductive tract. Berek and Novak's Gynecology. 15th Ed. Philadephia. Lipincott Williams and Wilkins; 2012:374-431.
17. Pahwa S, Shailja G, Jasmine K. Thyroid dysfunction in dysfunctional uterine bleeding. J Adv Res Bio Sci 2013;5(1):78-83.

18. Kundoor R, Rani BS. Thyroid function in abnormal uterine bleeding. Int J Reprod Contracept Obstet Gynecol 2019;8(6):2270-4.
19. Panicker V. Genetics of thyroid function and disease. Clin Biochem Rev 2011;32(4):165.
20. Dauksiene D, Petkeviciene J, Klumbiene J, Verkauskiene R, Vainikonyte-Kristapone J, Seibokaite A et al. Factors Associated with the Prevalence of Thyroid Nodules and Goiter in Middle-Aged Euthyroid Subjects. International Journal of Endocrinology 2017; 2017:1-8.
21. Verma A, Kaur AP, Shergill HK, Kaur S. Menstrual disorders in thyroid dysfunction. EJBPS. 2017;4(2):197-201.
22. Jinger SK, Verma A, Dayma I, Talreja T. To study the thyroid profile in menstrual disorder at tertiary care hospital in northern western Rajasthan, India. Int J Res Med Sci. 2017;5(5): 2212-4.
23. Reproduction and Thyroid. In: Hugh S Taylor, Lubna Pal, Emre Seli. eds. Speroff's Clinical Endocrinology and Infertility. 9th Ed. Philadelphia. Wolter Kluwer; 2020:1979-2026.