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Descriptive Study of Subclinical Hypothyroidism among Patients with Menstrual Disturbances

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Abstract: Menstrual abnormalities including heavy menstrual bleeding is a common complaint received in gyne outpatient, as it was estimated to be encountered in 20% of cases and though underlying causes are multiple and have a wide spectrum, including dysfunctional uterine bleeding, however among endocrine disorders, thyroid hormone disturbances are the most common. Thyroid hormone is an important contributor to menstrual disturbances through its effect both on ovaries in a direct way, or on SHBG indirectly. The objectives is Studying the prevalence of thyroid disorders, particularly subclinical hypothyroidism among patients with menstrual disturbances and describing the most common type of menstrual disturbance associated with this thyroid disorder. This is a cross sectional study for patients attending the gyne outpatient in the period between March 2021 and March 2022 with a complaint of menstrual disorders. The results showed that patients of the study sample were in the age range of 21- till 45, Apparently, the incidence of menstrual disturbances was increasing with increasing age of patients. Patients of the study sample were all selected among those with BMI falling between normal and overweight group. Once again within the selected BMI range, the prevalence of menstrual disturbances was increasing with increasing BMI. Regarding parity, menstrual disorders were encountered among patients of all parity categories, but again with increasing incidence with the increase in the parity. In conclusions Menstrual disorders, it is one of the most common problems encountered at the gyne outpatient, are encountered in a directly increasing frequency with patients' age, parity and BMI, with menorrhagia being the most frequently seen presentation.

Keywords: BMI, SHBG, GYNE.

INTRODUCTION

Menstrual abnormalities including heavy menstrual bleeding is a common complaint received in gyne outpatient, as it was estimated to be encountered in 20% of cases [Albers, J. R. *et al*., 2004] and though underlying causes are multiple and have a wide spectrum, including dysfunctional uterine bleeding, however among endocrine disorders, thyroid hormone disturbances are the most common [Kochupillai, N, 2000]. Thyroid hormone is an important contributor to menstrual disturbances through its effect both on ovaries in a direct way, or on SHBG indirectly [Poppe, K. *et al*., 2003] Though the effect of the hormone is well known over the sexual development and fertility, yet the impact on menstrual disturbances was identified since 1950s, when it was designated as an underlying cause of changes in all menstrual cycle parameters (regularity, duration and amount of menstrual flow) [Bals-Pratsch, M. *et al*., 1997]. Important to mention that the current guidelines recommend searching for hormonal disturbances among patients with menstrual disorders only when clinically indicated [Nice guideline, 2018]. Nevertheless, considering: the high prevalence of thyroid disorders, estimated to be in the figure of 26% of both pre and post-menopausal women, the fact that a considerable percentage of them are subclinical cases (10%), and that early detection by lab. test is feasible and might contribute to prevention, or at least early management, thus protecting the patient against all the possible consequences of heavy blood loss or the probable need of surgical intervention by D&C or hysterectomy [Sarbhai, V. *et al*., 2015]: it is for all these considerations, that we decided to arrange this study. To our knowledge, no similar studies have been done, at least in the region, which adds to the importance of our research.

OBJECTIVES

Studying the prevalence of thyroid disorders, particularly subclinical hypothyroidism among patients with menstrual disturbances and describing the most common type of menstrual disturbance associated with this thyroid disorder.

MATERIALS AND METHODS

This is a cross sectional study for patients attending the gyne outpatient in the period between March 2021 and March 2022 with a complaint of menstrual disorders.

Inclusion Criteria

Patients in the reproductive age group presenting with any type of menstrual disturbances without any history for a diagnosed thyroid disease, or clinical features suggestive of missed clinical thyroid disease. Th presenting menstrual disorders included:

-Hypomenorrhea (as indicated by reduced amount of bleeding estimated from less number of pads

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required per day or shorter duration of menstrual bleeding
- Heavy menstruation indicated by history of prolonged duration of bleeding, or passage of clots, or need to take time off work),
- Oligomenorrhea (as indicated by prolonged time interval between the the 1st day of menses of two subsequent menstrual bleeding cycles for more than 35 days),
-Polymenorrhea (as indicated by (decreased interval between the the 1st day of menses of two subsequent cycles),
-Metrorrhagia (indicated by irregularity of the menstrual bleeding combined with heaviness of the amount)

Exclusion Criteria
Any possible cause for heaviness of menstruation (gross organic, histological, hormonal, infective, bleeding tendency), all excluded by detailed history, by general physical examination along with pelvic examination, as well as routine investigation like CRP, Platelet count. Other patient entity excluded was those having intrauterine contraceptive device in place.

METHODS
Patients presenting to the gyne outpatient during the study period, and fulfilling the inclusion criteria were included in the study till the number of 200 was reached, each of those was then given a questionnaire to fill regarding some study parameters to be studied, they were next offered tests for thyroid function (TSH, T3, T4), and a test for autoimmunity (Anti PO Abs): a direct quantitative test by Elisa using human screening based calibration (made using a reference preparation, which has been assayed against the WHO 2nd IRP 80/558.

Normal levels for the thyroid function test adopted were: (TSH level = 0.39–6.16 lIU/ml, free T3 level = 1.4–4.2 pg/ml, and free T4 level = 0.8–2.0 ng/ml);

The thyroid function can designate the patients into 3 states:
1. Euthyroidism: when the TSH, T3, and T4 were within normal range
2. Hypothyroidism
- Subclinical hypothyroidism when TSH was high with T3 and T4 within normal range.
- Overt hypothyroidism: when the TSH was high and the levels of T3 and T4 levels were low,

3. Hyperthyroidism
- Subclinical hyperthyroidism: when the TSH was low and T3 and T4 levels were in normal range,
- Overt hyperthyroidism when TSH level was low and T3 and T4 levels were high.

STATISTICAL ANALYSIS
Describing characteristics of patients in the study sample regarding (age, parity, BMI, associated dysmenorrhea, duration of complaint). Describing the frequency of the several types of menstrual disturbances in those patients. Estimating the prevalence of thyroid disorders among those patients, and the contribution of subclinical hypothyroidism to their menstrual disorders. Describing the types of menstrual disorders among cases of subclinical hypothyroidism

RESULTS
Characteristics of the study sample were presented in **table 1.** The table showed that patients of the study sample were in the age range of 21- till 45, Apparently, the incidence of menstrual disturbances was increasing with increasing age of patients. Patients of the study sample were all selected among those with BMI falling between normal and overweight group. Once again within the selected BMI range, the prevalence of menstrual disturbances was increasing with increasing BMI. Regarding parity, menstrual disorders were encountered among patients of all parity categories, but again with increasing incidence with the increase in the parity.

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Table 1: Distribution of the characteristics of the study sample

Patient characteristics	Figure No./ %
Age	
Range	21-45 years
Median	38 years
Categories:	
20-29	54 (27%)
30-39	76 (38%)
40-44	70 (35%)
BMI	
Range	19-29Kg /m2
Median	26 Kg/m2
Categories:	
19-24.5	84 (42%)
24.5-29.5	116 (58%)
Parity	
Range	0-6 children
Median	3 children
Categories	
• Nulliparous	46 (23%)
• Monoparous	66 (33%)
• Multiparous	90 (45%)

Distribution of the study sample by the type of menstrual disorder with which they presented is shown in **table 2.** The table showed that the most common type of menstrual disorder encountered at the gyne outpatient was menorrhagia (56%) of cases, followed by oligomenorrhea (14%), while other menstrual disorders were encountered less frequently.

Table 2: Distribution of the study sample by type of menstrual disorders

Type of menstrual disorder	Figure No. / percentage
2ndary amenorrhea	8 (4%)
Hypomenorrhea	14 (7%)
Oligomenoorhea	28 (14%)
Polymenorrhea	14 (7%)
Menorrhagia	112 (56%)
Metrorhagia	24 (12%)

The distribution of the study sample by results of thyroid function test were shown in **table 3.** According to this table, most patients presenting with menstrual disorders were euthyroid (52%), yet hypothyroidism was encountered in 35 % of cases, being subclinical in 22% and overt in 13%. Hyperthyroidism on the other hand was the least frequently encountered (in 26%, being subclinical in 9% and overt in 4%. Importantly: those cases with subclinical hypothyroidism (44) were collectively reviewed to assesses the most common type of menstrual disorder with which they presented, and results showed that they majority of them (23) had menorrhagia, followed by oligomenorrhea (8), metrorrhagia in 5 of them, with other types less frequently encountered among remaining.

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Table 3: Distribution of the study sample by their thyroid function test

Thyroid function	Figure N0. / percentage
Euthyroid	104 (52%)
Hypothyroidism -Subclinical -Overt	70 (35%) (22%) (13%)
Hyperthyroidism -Subclinical -Overt	26 (13%) (9%) (4%)
Anti-TPO Abs	54 (27%)

DISCUSSION

Most literature as well as observations agree that menstrual disorders may accompany and sometimes, they may even precede thyroid dysfunction. Regarding characteristics of the study sample, the age group selected was ranging between 21-45 years, patients less than 20 years old were excluded since menstrual disturbances could have been attributed to hypothalamic pituitary immaturity, similarly, patients of ≥ 45 were again excluded since the incidence of endometrial pathologies is higher here and warrants endometrial biopsy to be excluded according to guidelines. As for the BMI, the study sample was selected among those of normal BMI, and overweight categories, whereas those of underweight or obesity were excluded since they don't represent majority of the population, and since both extremities once again may contribute to menstrual disorders. In perspective of parity, there was no limitation in patient selection. The finding of higher prevalence of menstrual disorders among those with higher age, BMI, and parity was not surprising and coincides with literature reports in this respect [Nice guideline, 2018]. Among those menstrual disorders, menorrhagia was the most common presenting disorder (56%), this finding was also consistent with findings by other studies in this respect, where menorrhagia was the most common complaint [Sarbhai, V. *et al*., 2015] [Pahwa, S]. Oligomenorhea was the 2nd most frequently presenting complaint (14%), with the other menstrual disorders encountered less frequently. Among patients of our study group (with neither organic, nor apparent clinical hormonal disturbance), abnormal thyroid function test was found in 48%, which is quite considerable: of frequency of hypothyroidism cases (35%) was more than double that of hyperthyroidism (13%). This high frequency of hypothyroidism cases is higher than that observed in previous similar studies: 14 % in the study of Kaur (8), 26. 5 % in the study of Padmaleela [Padmaleela, K. *et al*., 2013]. Interestingly: among those cases of hypothyroidism: the majority were subclinical (22%): which by lab test means that the patients were having normal T3, T4 levels, but just high TSH, but on clinical grounds, it also entails that the patients were not having any clinical features of hypothyroidism that would guide the clinicians to go and search for the thyroid function test. Surprisingly clinical hypothyroidism (low T3, T4 together with high TSH) was also found unexpectedly in 13% of those patients, though they did not admit did not come to admit any features of thyroid dysfunction during the process of sample selection aiming to exclude any patients with an already diagnosed, or misdiagnosed thyroid dysfunction. That could be attributed in part to the relative similarity and non-specificity of thyroid disease with other disease processes. Once again, the figure seems higher than that reported in similar previous studies as that by Gowri [Gowri, M. *et al*., 2014] and Sarabhai Vinita, *et al*, [Sarbhai, V. *et al*., 2014] who reported the frequency of (2.7 %).We cannot find an explanation for this relatively high prevalence of subclinical hypothyroidism among our patients, it could be partly due to iodine deficiency or mild thyroid pathologies that impair the thyroid function, but at the same time and considering the role of thyroid hormone in all the aspects of women's life, not only the reproductive as has been mentioned ahead in the introduction, but in other aspects concerning the health status and consequently the quality of life, such finding needs be kept in mind in the assessment of menstrual disorder patients. Anti TPO Abs were encountered in 27% of patients, a finding which is close to the result reported by previous studies [Sarbhai, V. *et al*., 2015], once again pointing out to the importance of sending for those antibodies in patients with menstrual disturbances.

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CONCLUSIONS

Menstrual disorders, one of the most common problems encountered at the gyne outpatient, are encountered in a directly increasing frequency with patients' age, parity and BMI, with menorrhagia being the most frequently seen presentation. Despite the broad and well recognized spectrum of underlying causes, hormonal disturbances remain important and frequent ones. The recommendations were always stressing upon limiting the workout of hormonal study upon the clinical situation: that is sending for a thyroid function test only when the patient admits having clinical features of thyroid dysfunction, and the same applies for serum prolactin, or serum testosterone, etc. Our study clearly shows that a considerable percentage of patients with menstrual disorders might be having an abnormal thyroid function test without showing any clinical features, that is when the T3, T4 levels were normal, but the TSH was compromised (given the term of subclinical thyroid dysfunction). Moreover, the patients (as in our study sample) might even be having abnormal levels of T3, T3, yet not admitting or not notifying about related clinical features. Omitting those patients from the work out of hormonal study would definitely result in missing a large proportion of patients, eventually depriving them from the proper diagnosis of the underlying cause at one side and delaying the management of thyroid dysfunction at the other side, and probably contributing to the progression from the subclinical to the more severe clinical form. Anti thyroid Abs have also been detected in a considerable frequency of those with menstrual disorders, emphasizing the importance of including it in the workout, especially after assessment of its cost-effectiveness on clinical grounds. Based on our study findings, we recommend sending patients with menstrual problems for a hormonal essay, especially thyroid function test and Anti TPO Abs routinely, whenever affordable, even in the absence of clinical features of underlying thyroid dysfunction.

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