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# Evaluation of Hyperprolactinemia and Thyroid disorder among Patient with Abnormal Uterine bleeding

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**Abstract**
**Introduction**: *Menstrual disturbances usually accompany clinical alteration in thyroid function and every clinician would have encountered altered menstrual pattern among women suffering from Thyroid disorder. A high serum Prolactin level can disturb the follicular maturation and corpus Luteum function, and lead to inhibition of normal pulsatile secretion of gonadotrophin releasing hormone in the hypothalamus resulting in anovulation.*
**Aim**: *To assess the Hyperprolactinemia and Thyroid disorder among patient with Abnormal Uterine Bleeding.*
**Method**: *A Hospital based cross-sectional, observational study was conducted in 150 patients in the department of gynaecology OPD in collaboration with department of Biochemistry and Endocrinology, IGIMS, Patna. The study lasts from May 2016 to October 2017. The patients who presented with abnormal uterine bleeding in age group of 15 -45 years in the out-patient department were recruited in the study after normal USG of Uterus and adnexa. Serum Prolactin and TSH, T3, T4 estimation and CBC, BT and CT were also done.*
**Result**: *In present study majority of patients were in the age group between 36-45 years and most of patient were multiparous (81.33%). Heavy menstrual bleeding (36%) was the most common symptom among AUB followed by Frequent menstruation (30%). Thyroid disorder (40.00%) and hyperprolactinemia (14.00%) was responsible for menstrual disturbances found in patient of AUB. Thyroid disorder and serum Prolactin both were responsible for AUB in (9.33%).*
**Conclusion**: *In our Study, 40.00% of cases had increased TSH, 14.00% had Increased Prolactin and 9.33% had both raised TSH and Prolactin associated with AUBand 36.67% were found to have no association with AUB.*
**Keyword**: *AUB, Prolactin, Thyroid function test.*

## Introduction

Abnormal Uterine Bleeding is a common but complicated clinical presentation. AUB is reported to occur in 9-14% women between menarche and menopause[1]. The prevalence varies in each country. In India, the reported prevalence of AUB is around17.9%.[2]. AUB is the complaint in approximately one third of all gynaecology

consultation[3]. AUB occur due toany disturbance in the normal physiology or anatomic changes in the endometrium[4]. Initially AUB was broadly divided intotwo categories- ovulatory and anovulatory, but now after November 2010 the International Federation of Gynaecology and obstetrics formally accepted a new classification for cause of AUB in reproductive years. The system is based on acronym PALM- COEIN. PALM (structural causes)- Polyps, Adenomyosis, Leiomyoma, Malignancy. COEIN (non-structural cause)-Coagulopathy, Ovulatory disorder, Endometrial causes, Iatrogenic, not classified [5,6]. Abnormality of menstruation is primarilya disorder of hypothalamic-pituitary-Ovarian axis either through direct effect or indirectly by their effect on target organ. Endocrinological disturbances other than the reproductive hormone forms a small but significant sub group in the etiopathogenesis of AUB. In many cases of AUB, after ruling out various causes, such as cervical or uterine pathology or pregnancy, patients are usually managed by hormonal treatment or blind surgical therapy[7]. High Serum prolactin level can disturb the follicular maturation with corpus luteum function, and leads to inhibition of normal pulsatile secretion of gonadotrophins- releasing hormone in hypothalamus[8]. It also leads to deficient secretion of LH and FSH which leads to inadequate induction of proper ovarian response[9]. Thyroid hormones are thought to affect the menstrual pattern directly through an effect on ovarian specific thyroid hormone receptors[10] and indirectly via their effects on sex hormone binding globulin, prolactin, and gonadotropin- releasing hormone secretion and on coagulation factors[11]. Alterations in production and activity of the thyroid hormones thyroxine(T4) and tri-iodothyronine (T3) may result in menstrual abnormalities. Both hypothyroidism and hypert-hyroidism result in menstrual disturbances[12]. The mechanism of menorrhagia in hypothyroidism is incompletely understood. It is postulated that infrequently or absent ovulation leads to deficient secretion of luteinizing hormone which may result in relative oestrogen excess thereby causing menorrhagia. Theremay be episodes of amenorrhoea interspersed with period of heavy vaginal bleeding also. Various studies have reported that there are changes in cycle length, amount and duration of bleeding associated with thyroid disorders. Studies showed that 33.3% patients with hypothyroidism had menorrhagia. It was due to poor progesterone production is associated with endometrial proliferation which may be responsible for massive bleeding (anovulatory bleeding) and another mechanism for this may be failure of LH secretion. 44.4% patients with hypothyroidism had oligomenorrhoea. Although National Institute for health and care Excellence guidelines[13] do not recommend the routine performance of thyroid function tests in women with menorrhagia, several studies[14] have shown that 16%-25% of menstrual cycle disorders result from thyroid dysfunction. Moragianni etal[15] also highlight the importance of thyroid function test in patients with menorrhagia. Timely detection of Thyroid disorders in patients presenting with menstrual disorders and their management can prevent surgical intervention like curettage and hysterectomy.

**Aim**

The aim of the study was to assess the thyroid and the prolactin levels among women of reproductive age with abnormal uterine bleeding.

**Method**

A Hospital based cross-sectional, observational study was conducted in the department of gynaecology OPD in collaboration with department of Biochemistry and department of Endocrinology, IGIMS, Patna. The study lasts from May 2016 to October 2017. The patients who presented with abnormal uterine bleeding to the out-patient department were recruited in the study.

**Inclusion criteria**-Patients in the age group of 15 to 45 with the complaints of AUB and with the

ultrasound findings showing normal uterus and ovaries were included in the study.

**Exclusion criteria**-Endocrine disorders leading to AUB such as Adrenal cause, organic cause of AUB such as fibroid, polyp, ovarian cyst. Patients on drugs and hormone therapy, IUCD user, history of bleeding disorders. Thyroid abnormalities like thyroid carcinoma or overt clinical symptom of thyroid dysfunction. Patients having these disorders were excluded from the study.

A total of one hundred and fifty patients who were fitting into the above criteria were included in the study. A detailed history related to onset, duration, interval and amount of bleeding was obtained from the patients. Evaluation of general physical examination along with pelvic examination, neck examination and breast examination for galactorrhoea was done. All patients were subjected to routine investigation like blood counts, bleeding time and clotting time to rule out coagulation defect and Ultrasound to rule out uterine and ovarian pathologies. Specific hormone level like freeT3, freeT4, TSH and prolactin estimation was done by immunoassay Tila technique, IGIMS, Lab finding.

Hyperprolactinemia was defined as a prolactin level of more than26.74ng/ml. Normal Prolactin (2.64 to26.74 ng/ml).

Hypothyroidism was considered when serum TSH was more than5.5uIU/ml. Normal TSH range from (0.3- 5.0uIU/ml). Normal value of Total T3(75-200ng/dl) and T4(0.8-2.8ng/dl).

**Results**

A total of 150 patients with AUB were included in the study. Out of these patients 122(81.33%) were multiparous and 28 (18.66%) were nulliparous. Thus maximum number of patients were in multiparous groups (Table-1).

In terms of the menstrual disturbances 54 patients (36%) had heavy menstrual bleeding and in this group maximum number of patients were in 26-35 years age group. Frequent menses was present in 45 patients (30%) and in this group maximum number of patients were in 36-45 years age group. Infrequent menses was present in 25 patients (16.66%) and in this group maximum number of patients were in 15-25 years age group. Metrorrhagia was present in 15 patients (10%) and in this group maximum number of patients were in 36-45 years age group. Menometrorrhagia was present in 8 patients (5.33%) and in this group maximum number of patients were in 36-45 years age group. Metropathia haemorrhagica was present in 3 patients (2%) and in this group maximum number of patients were in 36-45 years age group. Overall most common menstrual disturbance was heavy menstrual bleeding and least common menstrual disturbance was Metropathia haemorrhagica. Overall maximum number of patients were present in 36-45 years of age group and least number of patients were in the 25-35 years of age group (Table-2).

Raised level of serum TSH was present in 60 patients (40.00%) out of 150 patients. Raised TSH level was most commonly present in patients with heavy menstrual bleeding in 23 patients (38.33%). Raised level of serum Prolactin was present in 21 patients(14.00%) and it was most commonly associated with infrequent menses in 9 patients (42.86%)s. Both raised serum TSH and raised serum Prolactin was present in 14 patients(9.33%) and it was most commonly associated with heavy menstrual bleeding in 5 patients (35.71%) and infrequent menses in 4 patients (28.57%) (Table-3).

Maximum number of patients i.e; 40 patients(66.67%) had raised serum TSH level between 5.5-10 µIU/ml. 12 patients(20.00%) were in the range of 11-15 µIU/ml and 6 patients(10.00%) were in the range of 16-21 µIU/ml and 2 patients (3.33%) were in 22-27µIU/ml (Table- 4a). Maximum number of patients i.e;13 patients(61.9%) had raised serum Prolactin level between 27-36 ng/ml. 6 patients (28.57%) were in the range of 37-46 ng/ml and 2 patients(9.52%) had prolactin level more than 46 ng/ml (Table- 4b).

**Table 1.**Parity distribution of patients of AUB

| Parity | No of cases | Perentage |
|---|---|---|
| Nulliparous | 28 | 18.66% |
| P1 | 26 | 17.33 |
| >P1 | 96 | 64.00 |
| Total | 150 | 100 |

**Table 2.** Shows the pattern ofmenstrual disturbance in relation to age n=150.

| Menstrual disorders in relation to age | 15-25 yrs | 26-35 yrs | 36-45 yrs | Total |
|---|---|---|---|---|
| Heavy menstrual bleeding (HMB) | 8 | 32 | 14 | 54(36%) |
| Frequent menstruation | 15 | 5 | 25 | 45(30%) |
| Infrequent menses | 13 | 7 | 5 | 25(16.66%) |
| Metrorrhagia | 3 | 5 | 7 | 15(10%) |
| Menometrorrhagia | 0 | 2 | 6 | 8(5.33%) |
| Metropathia Haemorrhagica | 0 | 1 | 2 | 3 (2%) |
| Total | 39 (26%) | 52 (34.66%) | 59 (39.33%) | 150 (100%) |

**Table 3** Association between AUB diagnosed and ↑ TSH, ↑Prolactin, both ↑TSH and↑Prolactin leveln=150

| AUB diagnosed | Number of patients with ↑TSH (percentage) | Number of patients with ↑ prolactin (percentage) | Number of patients with↑TSH and ↑ prolactin (percentage) |
|---|---|---|---|
| HMB | 23 (38.33%) | 3 (14.29%) | 5 (35.71%) |
| Frequent menstruation | 16 (26.67%) | 2 (9.52%) | 2 (14.29%) |
| In Frequent menstruation | 4 (6.67%) | 9 (42.86%) | 4 (28.57%) |
| Metrorrhagia | 11 (18.33%) | 4 (19.05%) | 2 (14.29%) |
| Menometrorrhagia | 4 (6.67%) | 2 (9.52%) | 1 (7.14%) |
| Metropathia haemorrhagica | 2 (3.33%) | 1 (4.76%) | 0 (00%) |
| Total | 60(40.00%) | 21 (14.00%) | 14(9.33%) |

**Table 4 a**- distribution of patients according to TSH level (n=60)

| TSH level | Number of patients | Percentage |
|---|---|---|
| 5.5-10 µIU/ml | 40 | 66.67% |
| 11-15 µIU/ml | 12 | 20.00% |
| 16-21 µIU/ml | 6 | 10.00% |
| 22-27 µIU/ml | 2 | 3.33% |
| >27 µIU/ml | 0 | 0.00% |

**Table 4 b**- distribution of patients according to Prolactin level(n=21)

| Prolactin level | Number of patients | Percentage |
|---|---|---|
| 27-36 ng/ml | 13 | 61.9% |
| 37-46 ng/ml | 6 | 28.57% |
| >46 ng/ml | 2 | 9.52% |

**Discussion**

In present study majority of the study subjects were in the age group of 36-45 years where as the study done by John JD etal[16] and Pahwa Setal[17] found that AUB was more common in 25- 45 years of age group.

In our study majority of the women were multiparous 122 (81.33%) and 28 (18.66%) were nulliparous and it was similar to the finding quoted by Pilli etal[18].

In the present study, we found HMB to be the most common symptom in 54 patients (36%) among abnormal uterine bleeding and it is similar to the study done by Kumar etal. John JD etal found (42%) cases of menorrhagia among AUB. The present study had shown that the prevalence of hypothyroidism was (40.00%) among the patients with AUB. And the results quoted by N Bhavani etal shows that menorrhagia is the commonest bleeding pattern seen in 54% of cases [19]. Doifode etal[20], Shruti etal[21] had also shown

that menorrhagia as the most common symptom in patient with hypothyroidism or sub clinical hypothyroidism. In the present study hyperprolactinemia responsible for AUB was found in (14.00%) of patients similar to the study conducted by John JD etal quoted(18%) and Shin etal[22] observed a prevalence of (12%) among women with AUB in the age group of 21-30 years. The prevalence of hyperprolactinemia is 15-20% in women with abnormal uterine bleeding[23].

In the present study (9.33%) of patient shows both elevated Prolactin and elevated TSH level responsible for AUB. Similar study was conducted by John JD etal found positive correlation between TSH and Prolactin for AUB.

In present study, the association between elevated prolactin level and abnormal TSH was evident by showing a perfect positive correlation between TSH and serum prolactin level, indicating that the menstrual cycle is affected via a common pathway.

**Conclusion**

In our Study, 40.00% of cases had increased TSH, 14.00% had increased Prolactin and 9.33% had both raised TSH and Prolactin associated with AUB and 36.67% were found to have no association with AUB

Considering the importance of AUB in the daily clinical practice and the role of Thyroid/ Prolactin as a causative factor, there is a need to evaluate thyroid function and Serum Prolactin in each patient who presents with a history of Abnormal uterine bleeding. From our study it is evident that hypothyroidism and hyperprolactinemia is associated with abnormal uterine bleeding in a significant number of patients. Hence in investigating a patient with menorrhagia and /or menstrual irregularities, evaluation of Thyroid functional status and serum Prolactin level forms an essential component. It was also reported that 25% of gynaecological surgeries involve abnormal uterine bleeding. Early detection of hypothyroidism in such patient saves from surgical intervention like curettage and hysterectomy. The financial implication of screening for prolactin/Thyroid hormone abnormalities will have to be evaluated before a general recommendation can be made.

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