

# Frequency of Thyroid Dysfunction in Women with Abnormal Uterine Bleeding

Robina Farrukh<sup>1</sup>, Sumera Kanwal<sup>2</sup>, Anila Iqbal<sup>3</sup>, Madeeha Iqbal<sup>4</sup>, Farrukh Kamal<sup>5</sup>

- 1 *Consultant Gynecologist, Department of Gynecology, Fatima Jinnah Medical University, Lahore Pakistan*  
Study idea, Study designing
- 2 *Assistant Professor, Department of Gynecology & Obstetrics, Fatima Jinnah Medical University, Lahore Pakistan*  
Statistical analysis
- 3 *Post Graduate Resident, Department of Gynecology & Obstetrics, Fatima Jinnah Medical University/ Sir Ganga Ram Hospital, Lahore Pakistan*  
Data collection
- 4 *Assistant Professor, Department of Pathology, Fatima Jinnah Medical University, Lahore Pakistan*  
Reference's layout
- 5 *Professor, Department of Pathology, Fatima Jinnah Medical University, Lahore Pakistan*  
Supervision & Proof reading

## CORRESPONDING AUTHOR

**Dr. Robina Farrukh**  
Consultant Gynecologist, Department of  
Gynecology, Fatima Jinnah Medical University,  
Lahore Pakistan  
Email: robinafarrukh@gmail.com

Submitted for Publication: 06-12-2020  
Accepted for Publication 24-02-2021

**How to Cite:** Farrukh R, Kanwal S, Iqbal A, Iqbal M, Kamal F. Frequency of Thyroid Dysfunction in Women with Abnormal Uterine Bleeding. APMC 2021;15(2):125-9. DOI: 10.29054/APMC/2021.1111

## ABSTRACT

**Background:** Abnormal uterine bleeding is one of the major clinical presentation in the gynecology department. There is a wide range of implications of this condition affecting all age groups of females from menarche to menopause. It causes burden on finances in addition to compromising the quality of life of these females. In addition to other systemic symptoms, menstrual abnormality is one of the hallmarks of thyroid dysfunction. **Objective:** The objective of the study was to determine the frequency of thyroid dysfunction in women with abnormal uterine bleeding. **Study Design:** Cross sectional study. **Settings:** The study was conducted at gynecology outpatient department, Sir Ganga Ram Hospital, Lahore Pakistan. **Duration:** Six months from 15<sup>th</sup> March 2018 till 15<sup>th</sup> September 2018. **Methodology:** All the women presenting with abnormal uterine bleeding in outpatient department of Sir Ganga Ram Hospital fulfilling, the inclusion criteria were included in study. After explaining about the study, consent was obtained from the patient. Demographic details were recorded as well as detailed menstrual history with respect to onset, time duration, estimated amount and any other symptom related to it was obtained. Clinical examination including general physical signs, systemic, gynecological examination and thyroid gland examination was carried out. Blood samples were taken from all these patients with complete aseptic techniques and sent to hospital laboratory for serum T3 (triiodothyronine), T4 (thyroxine) and TSH (thyroid stimulating hormone) estimation. Data was collected on predesigned proforma. **Results:** Among the 300 women included in the study, mean age was 36.25±5.89 years, with minimum and maximum age as 18 and 45 years. The mean TSH in these females was 1.97±1.92 μIU/ml with minimum and maximum level as 0.1 μIU/ml and 7.73 μIU/ml. Thyroid dysfunction was seen in 114 (38%) of the females while in 186 (62%) TSH was in normal range. As in 186 (62%) females the TSH was normal. While 36 (12%) cases had hypothyroidism and 78 (26%) females had hyperthyroidism. **Conclusion:** It is concluded that there is increased frequency of thyroid dysfunction in women with abnormal uterine bleeding therefore thyroid function tests should be routinely carried out in the women presenting with this complaint.

**Keywords:** TSH (Thyroid Stimulating Hormone), Thyroid dysfunction, Abnormal uterine bleeding.

## INTRODUCTION

Abnormal uterine bleeding (AUB) is one of the common symptoms of presentation at gynecology clinic. This comprise of 20% of the women presenting in gynecology outpatient department.<sup>1</sup> Abnormal uterine bleeding has wide range of implications on women health and quality of life due to blood loss, pain, compromised sexual health, fertility and increased health care cost.<sup>2</sup> The approved definition of abnormal uterine bleeding by FIGO (The International Federation of Gynecology and Obstetrics) encompasses any bleeding originating from the uterine corpus that is not normal, regarding its regularity, amount, frequency or time duration and pregnancy is

excluded, particularly.<sup>3</sup> Any deviation in normal physiology or anatomy of the endometrium will lead to abnormal uterine bleeding.<sup>4</sup> The International Federation of Gynecology and Obstetrics has compiled the causes of abnormal uterine bleeding in an acronym, PALM-COEIN. PALM (structural causes): Polyps, Adenomyosis, Leiomyomas, Malignant causes. COEIN (non-structural causes) Coagulopathies, Ovulatory dysfunction, Endometrial pathology, Iatrogenic causes, Not classified.<sup>5</sup> Among the ovulatory disorders, malfunctioning thyroid gland is one of the main causes. About 9-14% of females are affected by thyroid dysfunction during reproductive life.<sup>6</sup> Both hypo and hyperthyroidism can lead to

menstrual disturbance in addition to other effects on reproductive system like delay in puberty, ovulatory dysfunction and risk of miscarriage.<sup>7</sup> Hypothyroidism usually manifest as menorrhagia while hyperthyroidism with oligomenorrhea or hypomenorrhea.<sup>6</sup> Hypothyroidism can cause heavy menstrual bleeding even though the function is mildly deranged. There is limited evidence to exactly explain its mechanism of heavy menstrual loss in hypothyroidism. Elevated TRH leads to elevated prolactin level which inhibits LH surge, resulting in anovulatory cycle and finally causing breakthrough bleeding, manifesting as menorrhagia.<sup>8</sup> Hypothyroidism leads to changes in peripheral metabolic mechanism of estrogen, reducing sex hormone binding globulin (SHBG) synthesis, due to which feedback at the level of the pituitary gland is disturbed. Other than the hormonal mechanisms, altered production of coagulation factors (decreased levels of factor 7, 8, 9, 11) is another possible mechanism underlying menorrhagia in hypothyroidism. Etiology of Hyperthyroidism on menstrual dysfunction is not completely known, either it is primary effect of thyroid on ovary or uterus or effect of pituitary dysfunction. There is altered production or release of gonadotrophins, due to the increased thyroid hormones effecting at hypothalamic and pituitary levels. SHBG levels are also found to be elevated in thyrotoxicosis which may also lead to these effects.<sup>9,10</sup> Many women have subclinical thyroid dysfunction and only presentation is abnormal uterine bleeding so it is important to investigate it along with other causes so that correct therapy could be provided which will not only treat her gynecological problem but overall wellbeing as well.

The objective of the study was to determine the frequency of thyroid dysfunction in females suffering from abnormal uterine bleeding.

## METHODOLOGY

**Study Design:** Prospective, cross-sectional study.

**Settings:** Gynecology outpatient department of Sir Ganga Ram Hospital, Lahore Pakistan.

**Duration:** 6 months after approval of research proposal (March 15, 2018 to September 15, 2018).

**Sample Technique:** Non probability consecutive sampling.

**Sample Size:** A total of 300 patients presenting with complaint of abnormal uterine bleeding were included in the study. Detailed history from every patient was taken with emphasis on exact age of the patient, pattern of bleeding, onset of the problem, time duration, and estimate of amount of blood loss.

**Inclusion Criteria:** All patients from 18- 45 years of age, having complaint of abnormal uterine bleeding were included.

**Exclusion Criteria:** Patient with previous known thyroid disorder (assessed on clinical record), patients with

structural abnormality of uterus, history of childbirth within one year, history of miscarriage within 3 months, IUCD (intrauterine contraceptive device)/OCP (oral contraceptive pills) users (assessed clinically or on ultrasound) and patients with diagnosed hepatic pathology or coagulation disorders, malignancy of genital tract, autoimmune disorders (assessed on clinical record) were excluded.

**Data Collection Procedure:** After taking detailed history a thorough clinical examination including general physical signs, systemic, gynecologic examination and thyroid gland examination was done. With full aseptic techniques blood sample was drawn from all the females fulfilling inclusion and exclusion criteria and sent to hospital laboratory for analysis regarding serum T3, T4 and TSH. Normal serum concentrations were taken as a standard reference.

- T3-0.85-2.02ng/ml
- T4-5.14-14.1µg/dl
- TSH-0.27-4.2µIU/ml

Complete data was recorded on the prescribed proforma.

**Data Analysis:** Data entry and analysis were done through SPSS version 20. Mean and S.D(standard deviation) were calculated for quantitative variables like age and TSH levels. The data was divided into 2 groups "yes" and "No" according to abnormal thyroid function and normal respectively. For categorical data like thyroid dysfunction, frequency and percentages were used. Data was stratified for age, parity, duration and type of abnormal uterine bleeding to see role of those effect modifiers. Post stratified Chi-Square test was applied considering significant value of p as  $\leq 0.05$ .

## Ethical Considerations:

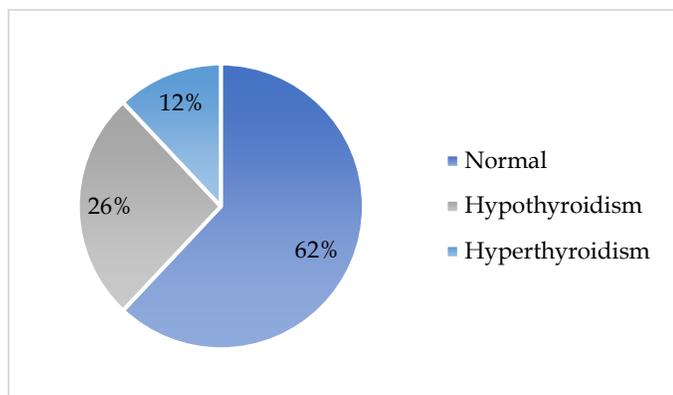
- There was nothing harmful for the patients as there was no intervention in the study.
- Written informed consent of all the participants was obtained before enrollment in the study.

Ethical approval was granted by institutional ethical committee before starting the study.

## RESULTS

Mean age of females was  $36.25 \pm 5.89$  years with minimum and maximum age 18 and 45 year respectively. The mean TSH in the study population was  $1.97 \mu\text{IU} / \text{ml} \pm 1.92 \mu\text{IU} / \text{ml}$  with minimum and maximum level as  $0.1 \mu\text{IU} / \text{ml}$  and  $7.73 \mu\text{IU} / \text{m}$  respectively. Thyroid dysfunction was seen in 114(38%) females while in 186 (62%) cases TSH was in normal range. In 36 (12%) cases had hypothyroidism and 78 (26%) females had hyperthyroidism. Figure 1

When data was stratified for age, the frequency of thyroid dysfunction was statistically same in 18-30 years old females (35.1%cases) and in age group of 31-45 years (38.7%), p-value  $> 0.05$ . Table 1

**Figure 1: Distribution of types of thyroid dysfunctions****Table 1: Comparison of thyroid dysfunction with respect to age group(years)**

	Age groups (years)	Thyroid dysfunction		Total
		yes	No	
	18-30	20 (35.1%)	37 (64.9%)	57 (100%)
	31-45	94 (38.7%)	149 (61.3%)	243 (100%)
Total		114 (38%)	186 (62%)	300 (100%)

Chi-square=0.253 p-value=0.615(Insignificant)

The frequency of thyroid dysfunction was also statistically same in parity  $<2$  and  $\geq 2$ , that is 34.4% versus 42%, with respect to duration  $<6$  months versus  $\geq 6$  months that is 37.1% versus 38.8%, p-value  $>0.05$ . The frequency of thyroid dysfunction was statistically same in cases of abnormal uterine bleeding (35%). In females having menorrhagia (47%), patients with metrorrhagia (34.3%) and patients with polymenorrhea (33.8%), p-value  $>0.05$ . Table 2

Moreover, frequency of different types of thyroid dysfunction was statistically same, in both age groups, with respect to parity, duration of bleeding and types of AUB, p-value  $>0.05$ . Table 3, 4.

**Table 2: Comparison of thyroid dysfunction with respect to type of AUB (abnormal uterine bleeding)**

	Types of AUB	Thyroid dysfunction		Total
		Yes	No	
	Dysfunctional uterine bleeding	30(35.3%)	55(64.7%)	85(100%)
	Menorrhagia	39(47%)	44(53%)	83(100%)
	Metrorrhagia	23(34.3%)	44(65.7%)	67(100%)
	Polymenorrhea	22(33.8%)	43(66.2%)	65(100%)
Total		114(100%)	186(100%)	300(100%)

Chi-square=3.969 p-value=0.265(Insignificant)

**Table 3: Comparison of types of thyroid dysfunction with respect to age groups**

	Age groups (years)	Type of Thyroid dysfunction			Total
		Normal function	Hypo-thyroidism	Hyper-thyroidism	
	18-30	37 (64.9%)	8 (14%)	12 (21.1%)	57 (100%)
	31-45	149 (61.3%)	28 (11.5%)	66 (27.2%)	243 (100%)
Total		186 (62%)	36 (12%)	78 (26%)	300 (100%)

Chi-square=1.002 p-value=0.606(Insignificant)

**Table 4: Comparison of types of thyroid dysfunction with respect to types of AUB**

	Duration of AUB	Type of Thyroid dysfunction			Total
		Normal function	Hypo-thyroidism	Hyper-thyroidism	
	Dysfunctional uterine bleeding	55 (64.7%)	12 (14.1%)	18 (21.2%)	85 (100%)
	Menorrhagia	44 (53%)	14 (16.9%)	25 (30.1%)	83 (100%)
	Metrorrhagia	44 (65.7%)	2 (3%)	21 (21.3%)	67 (100%)
	Polymenorrhea	43 (66.2%)	8 (12.3%)	14 (21.5%)	65 (100%)
Total		186 (62%)	36 (12%)	78 (26%)	300 (100%)

Chi-square=10.543, p-value=0.104 (Insignificant)

## DISCUSSION

Abnormal uterine bleeding comprises of major proportion of the patients presenting in gynecology clinics.<sup>11,12</sup> The term AUB in broader perspective incorporates all forms of abnormal vaginal bleeding. Most of the time the use of other terminologies for vaginal bleeding are not clearly comprehended by most of the health care staff.<sup>11</sup> Heavy menstrual bleeding is the loss of greater than or equal to 80 ml of blood in a menstrual cycle, but woman's self-assessment regarding heavy loss is one of the main indications for further evaluation and management.<sup>13</sup>

In this study the mean age of females turned out to be  $36.25 \pm 5.89$  years with minimum and maximum age as 18 and 45 years respectively. 19% were 18-30 years old and 81 % females were 31-45 years old. A study was done on over 34 years of age and they reported that in 19 % of cases patient's age was between 45-54 years as compared to 6% patients ranging between 35 to 44 years.<sup>14</sup> It has been observed that anovulatory abnormal uterine bleeding is more common at extremes of reproductive life.<sup>15</sup> A total of 28.33% females had dysfunctional uterine bleeding, 27.67% females had menorrhagia, 21.66% females had polymenorrhea. Another study reported menstrual pattern in premenopausal woman 131 (76.6%)

had regular cycle while 40 (23.4%) did not had regular periods. The patients in the latter group were found to had oligomenorrhea and menorrhagia more frequently.<sup>16</sup> Goldsmith et al conducted a study on premenopausal women to see the pattern of menstrual cycle in patients with thyroid disease and reported that one patient was amenorrhagic, five patients were found to be suffering from Metrorrhagia haemorrhagica, and two had menorrhagia<sup>17</sup>.

In AUB (abnormal uterine bleeding), thyroid dysfunction is usually an associated cause. Most of the time health care personals come across change in pattern of menstrual cycle in women already diagnosed with disturbance of thyroid function.<sup>18</sup>

In general, thyroid dysfunction, specifically hypothyroidism cause wide range of menstrual as well as other problems (for example: menstrual onset, growth spurt, cycle regularity, conception, fetal metabolism, puerperium, menopause) in females from puberty till menopause. Most of the clinicians have concluded that menstrual disturbances might manifest before or after the derangement of thyroid functions. So major objective of the current study was also the same, as to find out the frequency of thyroid dysfunction in patients with abnormal uterine bleeding. According to the current study it was found that the mean TSH in these females was  $1.97 \pm 1.92 \mu\text{IU/ml}$  with minimum and maximum level as  $0.1 \mu\text{IU/ml}$  and  $7.73 \mu\text{IU/ml}$  respectively. Thyroid dysfunction was seen in 114 (38%) of females while in 186(62%) cases TSH was in normal range. As in 186(62%) females the TSH was normal, while 361(12%) cases had hypothyroidism and 78(26%) females had hyperthyroidism.

In one larger study, hypothyroidism was found affecting approximately 11% of the cases.<sup>19</sup> This figure is below than the frequency found in the current study. A recent study in 2015 reported that 30% patients with AUB were detected with thyroid malfunction, from these 18% women were found to have subclinical hypothyroidism, 9% of women had hypothyroidism while 3% of women were found to have hyperthyroidism.<sup>20</sup> In current study hyperthyroidism was 4 times higher and hypothyroidism was also higher in this study. Another study in 2013 reported that thyroid dysfunction was found in up to 26.5% of the women. Hypothyroidism was revealed in 18.1% while 8.4% of women had hyperthyroidism, presenting with dysfunctional uterine bleeding.<sup>21</sup> In the current study we found higher frequency of thyroid disorder and the types of thyroid dysfunction was also comparable. Abdel Hamid et al conducted a case-controlled study, regarding the hyperprolactinemia prevalence and thyroid dysfunction in patients presenting with abnormal uterine bleeding. An elevated thyroid stimulating hormone (TSH) level was found in 8(7.6%) patients with AUB, while low levels of free triiodothyronine / thyroxine were found in 5(4.8%) patients,

as compared to 2 (1.6%) patients and 1(0.8%) patient in control group. Majority of the patients presented with Polymenorrhea (n=60[57.1%]). Five (29.4%) patients with hyperprolactinemia with galactorrhea. Hyperthyroidism with hyperprolactinemia was found in 8(47.1%) patients with AUB. On the other hand, 1(1.1%) patient had raised TSH, but prolactin level was found within normal range.<sup>22</sup>

Deshmukh et al conducted a study to investigate thyroid functions in patients with AUB as initial diagnosis and then sent the patients with abnormal results, to physician for further workup and optimization. Thyroid dysfunction was detected in 30% of the study population. Out of those subclinical hypothyroidism was found in 18% of patients, overt hypothyroidism in 9% of patients and hyperthyroidism in only 3 % of the patients. Polymenorrhagia and menorrhagia were found to be common in subclinical hypothyroid patients. On the other hand, oligomenorrhea was common in hyperthyroid patients. Subclinical and overt hypothyroidism were most prevalent type of thyroid dysfunctions associated with menorrhagia most of the time. Therefore, the researchers suggested obligatory evaluation of thyroid function for the women presenting with dysfunctional uterine bleeding.<sup>23</sup> A study carried out by Sudhir et al was designed to evaluate thyroid function derangement in women presenting with abnormal uterine bleeding, detected cases were managed in collaboration with physician. Thyroid dysfunction was detected in 20 % of patients, out of those 20% patients, 16% were with hypothyroidism and just 4% were hyperthyroid. Majority of subclinical hypothyroid patients presented with polymenorrhagia and menorrhagia.<sup>23</sup> So, all these studies suggest that thyroid dysfunction in females with AUB is higher. Therefore, appropriate evaluation and early screening must be opted to reduce the related risk. Thyroid disorders can affect various physiological phenomena particularly menstruation.<sup>24</sup> It must be ruled out as soon as possible because frequently, disorders of thyroid gland function are underestimated and in asymptomatic cases it is commonly neglected by practitioners.<sup>19</sup> Therefore, optimally treated thyroid dysfunction will not only have beneficial impact on menstrual disorder, but it will also help in improving fertility. There is a close relationship of thyroid hormones and steroid hormone action and production regarding normal function of the ovary and conception. The patients with thyroid dysfunction are frequently found to have disturbed menstruation, fertility issues and complications during antenatal period and puerperium.

## CONCLUSION

It is concluded that females with AUB have high frequency of thyroid dysfunction.

**SUGGESTIONS / RECOMMENDATIONS**

Further studies should be designed to evaluate thyroid dysfunction as risk factor for AUB. In future females having AUB must be considered for evaluation of thyroid dysfunction to decrease related risk and morbidity.

**CONFLICT OF INTEREST / DISCLOSURE**

None.

**ACKNOWLEDGEMENTS**

None.

**REFERENCES**

- Albers JR, Hull SK, Wesley RM. Abnormal uterine bleeding. *Am Fam Phys.* 2004;69(8):1915-34.
- Rahn DD, Abed H, Sung VW, Matteson KA, Rogers RG, Morrill MY, et al; Society of Gynecologic Surgeons-Systematic Review Group. Systematic review highlights difficulty interpreting diverse clinical outcomes in abnormal uterine bleeding trials. *J Clin Epidemiol.* 2011;64(3):293-300.
- Munro MG, Critchley HO, Broder MS, Fraser IS. FIGO classification system (PALM COEIN) for causes of abnormal uterine bleeding in nonpregnant women of reproductive age. *IJOG, Obstetrics.* 2011;113(1):3-13.
- Bhavani N, Sathineedi A, Giri A, Chippa S, Prasannakumar V S. A study of correlation between abnormal uterine bleeding and thyroid dysfunction. *Int J Recent Trends Sci Tech.* 2015;14(1):131-5.
- Munro MG, Critchley HOD, Fraser I. The FIGO systems for nomenclature and classification of causes of abnormal uterine bleeding in the reproductive years who needs them. *Am J Obstet Gynaecol.* 2012;207(4):259-65.
- Manjeera LM, Kaur P. Association of thyroid dysfunction with abnormal uterine bleeding. *Int J Reprod Contracept Obstet Gynecol.* 2018;7:2388-92
- Sudha HC, Sunanda KM, Anitha GS. Abnormal uterine bleeding in relation to thyroid dysfunction. *Int J Reprod Contracept Obstet Gynecol.* 2018;7:4525-30
- Rani AS, Rekha B, Reddy GA. Study of Hypothyroidism in Women with Abnormal Uterine Bleeding. *IOSR-JDMS.* 2016;15:12-18. .
- Byna P, Siddula S, Kolli S, Shaik MV. Thyroid abnormality in perimenopausal women with abnormal uterine bleeding. *Int J Res Med Sci.* 2015;3(11):3250-3.
- Tara. Thyroid Dysfunction and Abnormal Uterine Bleeding. *J Gynecol Women's Health.* 2019; 15(4):555919.
- Matthews ML. Abnormal uterine bleeding in reproductive-aged women. *Obstet Gynecol Clin North Am.* 2015;42(1):103-15.
- Albers JR, Hull SK, Wesley RM. Abnormal uterine bleeding. *Am Fam Physician.* 2004;69(8):1915-26.
- Lethaby A, Augood C, Duckitt K, Farquhar C. Nonsteroidal anti-inflammatory drugs for heavy menstrual bleeding. *Cochrane Database Syst Rev.* 2007;(4):CD000400.
- Reed SD, Newton KM, Clinton WL, Epplein M, Garcia R, Allison K, Voigt LF, Weiss NS. Incidence of endometrial hyperplasia. *Am J Obstet Gynecol.* 2009;200(6):678.e1-6.
- Committee on Practice Bulletins—Gynecology. Practice bulletin no. 136: management of abnormal uterine bleeding associated with ovulatory dysfunction. *Obstet Gynecol.* 2013;122(1):176-85.
- Krassas GE, Pontikides N, Kaltsas T, Papadopoulou P, Paunkovic J, Paunkovic N, Duntas LH. Disturbances of menstruation in hypothyroidism. *Clin Endocrinol (Oxf).* 1999;50(5):655-9.
- Goldsmith RE, Sturgis SH, Lerman J, Stanbury JB. The menstrual pattern in thyroid disease. *J Clin Endocrinol Metab.* 1952;12(7):846-55.
- Marimuthu K, Loganathan M. Influence of thyroid gland in women with abnormal uterine bleeding in reproductive age group. *Int J Reprod Contracept Obstet Gynecol.* 2017;6:2222-5.
- Tiwari M, Agrawal S and Subarna M. Abnormal Uterine Bleeding (AUB) and Thyroid Function in Chhattisgarh. *Int J User-Driven Healthcare.* 2017;7:29-41.
- Deshmukh PY, Boricha BG, Pandey A. The association of thyroid disorders with abnormal uterine bleeding. *Int J Reprod Contracept Obstet Gynecol.* 2015;4:701-8.
- Padmaleela K, Thomas V, Km L, & Kiranmai D. Thyroid disorders in dysfunctional uterine bleeding (dub) among reproductive age group women - a cross-sectional study in a tertiary care hospital in Andhra Pradesh, India. *Int J Med Pharma Sci.* 2013;4:41-6.
- Abdel Hamid AM, Borg TF, Madkour WA. Prevalence of hyperprolactinemia and thyroid disorders among patients with abnormal uterine bleeding. *Int J Gynaecol Obstet.* 2015;131(3):273-6.
- Sudhir A, Rasquinha S, Rajagopal K. Thyroid dysfunction in abnormal uterine bleeding. *J Evolution Med Dent Sci.* 2016;5(38):2287-9,
- Khatiwada S, Gautam S, KC R, Singh S, Shrestha S, Jha P, Baral N, Lamsal M. Pattern of Thyroid Dysfunction in Women with Menstrual Disorders. *Ann Clin Chem Lab Med.* 2016;2(1):3-6.