



**RESEARCH ARTICLE**

**MENSTRUAL PATTERN AND ITS RELATION TO THYROID PROBLEMS IN WOMEN  
IN NORTHERN SAUDI ARABIA**

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**ARTICLE INFO**

**Article History:**

Received 17<sup>th</sup> August, 2017

Received in revised form

29<sup>th</sup> September, 2017

Accepted 07<sup>th</sup> October, 2017

Published online 30<sup>th</sup> November, 2017

**Key words:**

Menstrual,  
Thyroid,  
Women.

**ABSTRACT**

**Background:** Menstrual problems account for much of the morbidity, affecting one in every five women during their life span. Thyroid dysfunction is associated with a range of menstrual abnormalities, including oligomenorrhea, amenorrhea, and menorrhagia. The aim of this study is to show the menstrual pattern in the studied women and to study the effect of thyroid disorders on the menstrual pattern among the affected women.

**Methods:** A cross-sectional study was conducted in Northern Saudi Arabia. The study included 160 randomly selected women from the general female population of Northern Saudi Arabia. A pre-designed online questionnaire which was distributed among the population. The questionnaire included the relevant questions to collect data about the socio-demographic characteristics of the participants, if the patient has menstrual disorders or thyroid disorders and their relation to each others.

**Results:** Ninety three (58.1%) of the studied women had menstrual irregularity. Twenty one (13.1%) of the studied women had Hypothyroidism and only one case (0.6%) had Hyperthyroidism, 7.5% only of hypothyroidism cases had menstrual irregularity. There was a significant relationship between thyroid problems and menstrual irregularity and abnormal uterine bleeding ( $P < 0.05$ ).

**Conclusion:** These data demonstrate that hyperthyroidism in women is less frequently associated with menstrual abnormalities than was expected. Furthermore, There was a significant relationship between thyroid problems and menstrual irregularity and abnormal uterine bleeding ( $P < 0.05$ ).

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**Citation:** Amjad Hamoud Alruwaili, Anfal Nayir Alanazi, Duaa Sami A Alsunayni, Arwa Bader N Alanazi, Zaynab Hussain M Almukalaf, Ibtisam Matan Alanazi et al. 2017. "Menstrual pattern and its relation to thyroid problems in women in northern Saudi Arabia", *International Journal of Current Research*, 9, (11), 60723-60726.

**INTRODUCTION**

Menstrual problems account for much of the morbidity, affecting one in every five women during their life span (Abid, 2014). Prevalence of menstrual morbidity in developing countries is comparable to that observed in developed countries and menstrual dysfunction represents a problem for women in developing countries. In developing countries, abnormal uterine bleeding appears to affect about 5-15% of women of reproductive age and probably a higher percent of women in older age groups. Others menstrual disorders include amenorrhea, dysmenorrhea etc. (Harlow, 2004). Thyroid dysfunction is associated with a range of menstrual abnormalities, including oligomenorrhea, amenorrhea, and menorrhagia. Women with hypothyroidism may also be at increased risk of pregnancy loss.

The connection between thyroid hormone levels and the menstrual cycle is mainly mediated by thyrotropin-releasing hormone (TRH), which has a direct effect on the ovary. Additionally, abnormal thyroid function can alter levels of sex hormone-binding globulin, prolactin, and gonadotropin-releasing hormone, contributing to menstrual dysfunction. For example, increased levels of TRH may raise prolactin levels, contributing to the amenorrhea associated with hypothyroidism (Speroff, 2005). A previous study found that; of the 171 hypothyroid patients, 131 (76.6%) had regular cycles and 40 (23.4%) irregular periods. Oligomenorrhea and menorrhagia were the most common features in the latter group. No difference in BMI was found between the patients with or without menstrual abnormalities, or between patients and controls. Forty-six (26.9%) out of 171 patients had subclinical hypothyroidism (group A), 42 (24.6%) mild hypothyroidism (group B) and 83 (48.5%) severe hypothyroidism (group C). Thirty-seven from group A (80.4%), 32 from group B (76.2%) and 62 from group C (74.7%) had normal periods (Krassas,

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1999). Another study on the same topic found that; among patients with overt hypothyroidism, the most frequent menstrual disorders were hypermenorrhea, menorrhagia, oligomenorrhea, and polymenorrhea. Hypermenorrhea was significantly more common (33.3%) than in controls (5.6%) ( $P<0.05$ ). Among hypothyroid patients, hypermenorrhoea was more common (35%) in those with severe hypothyroidism than in those (16.5%) with mild hypothyroidism ( $P<0.05$ ). The prevalence of menstrual disturbances in the other groups of thyroid dysfunction patients was not significantly different than that of controls (GökçenGüngör, 2015). The aim of this study is to show the menstrual pattern in the studied women and to study the effect of thyroid disorders on the menstrual pattern among the affected women.

## MATERIALS AND METHODS

**Study design:** A cross-sectional study was conducted in Northern Saudi Arabia. The study included 160 women from the general female population of Northern Saudi Arabia.

**Data collection:** by a pre-designed online questionnaire which was distributed among the population. It was self-administered by participants after a brief introduction or explanation of the idea of the research. The questionnaire included the relevant questions to collect data about:

- Socio-demographic characteristics of the participants including age, marital status and educational status
- If the patient has menstrual disorders or thyroid disorders
- Thyroid dysfunction and menstrual disturbance and their relation to each others.

### Statistical analysis

Collected data was coded and analyzed using statistical package for the social sciences (SPSS, version 15). Descriptive statistics for the prevalence and quantitative variables was used. Relation between thyroid dysfunction and menstrual disturbance was determined using the chi-square test. P-value of less than 0.05 was considered statistically significant.

### Ethical considerations

This study was reviewed and approved by the Research Ethics Committee of Faculty of Medicine, Northern Border University. Participants were informed that participation is completely voluntary and data collectors introduced and explained the research to participants. No names were recorded on the questionnaires and all questionnaires kept safe.

## RESULTS

Table (1) shows sociodemographic, menstrual history and thyroid problems in the studied women. 46.2% of the studied women aged less than 20 years, 27.5% aged 20-30 years, 17.5% between 30-40 years and only 8.8% aged more than 40 years. Age of menarche in 86.2% of studied women was between 11-15 years. 58.1% of the studied women had menstrual irregularity but only 10% reported abnormal uterine bleeding. 47.5% of women reported 7-9 days as period of menses, 43.1% reported 4-7 days and 9.4% reported more than 9 days. 41.2% of women reported dysmenorrhea (46.8% manage it with antispasmodics, 46.2% with herbs and 5% do

nothing). Regarding thyroid problems; 13.1% of studied women had Hypothyroidism and only 0.6% had Hyperthyroidism.

**Table 1. Sociodemographic, menstrual history and thyroid problems in the studied women**

Age group	No. (n=160)	%
> 20	74	46.2
20-	44	27.5
30-	28	17.5
40+	14	8.8
Age of menarche (in years)		
>11	13	8.1
11-	138	86.2
15+	9	5.6
Marital status		
Single	98	61.2
Married	60	37.5
Divorced	2	1.2
Menstrual irregularity		
Yes	93	58.1
No	67	41.9
Period of menses (in days)		
4-	69	43.1
7-	76	47.5
9+	15	9.4
Dysmenorrhea		
No	94	58.8
Yes	66	41.2
Management of dysmenorrhea		
Nothing	8	5.0
Herbs	74	46.2
Antispasmodics	75	46.8
Hot compresses	3	1.9
Abnormal uterine bleeding		
Yes	16	10.0
No	144	90.0
Thyroid problems		
Hypothyroidism	21	13.1
Hyperthyroidism	1	0.6
No	138	86.2

Table (2) illustrates the relationship between thyroid problems and menstrual irregularity in the studied women. Among the 93 cases of menstrual irregularity, 91.4% had no thyroid problems, 7(7.5%) had hypothyroidism and 1(1.1%) had hyperthyroidism. On the other hand, 53(79.1%) of regular menses participants had no thyroid problems, and 14(20.9%) had hypothyroidism. There was a significant relation between menstrual irregularity and thyroid problems ( $P= 0.03$ ).

**Table 2. Relationship between thyroid problems and menstrual irregularity in the studied women, Arar, 2017**

Thyroid problems	Menstrual irregularity		Total	P value
	Yes (n=93)	No (n=67)		
Hypothyroidism	7 7.5%	14 20.9%	21	0.03
Hyperthyroidism	1 1.1%	0 .0%	1	.6%
No	85 91.4%	53 79.1%	138 86.2%	

Table (3) illustrates the relationship between thyroid problems and abnormal uterine bleeding in the studied women. Among the 144 participants who did not have of abnormal uterine bleeding, 127(88.2%) had no thyroid problems, 17(11.8%) had hypothyroidism. On the other hand, 11(68.8%) of cases of abnormal uterine bleeding had no thyroid problems, and 4(25%) had hypothyroidism and one case (6.2%) had hyperthyroidism. There was a significant relation between abnormal uterine bleeding and thyroid problems ( $P= 0.03$ ).

Table (4): illustrate relationship between hypothyroidism and age of menarche and period of menses in the studied women. Among 21 hypothyroidism cases, 3(14.3%) got menarche below 11 years old, 14(66.7%) between 11-15 years and 4(19.0%) above 15 years. On the other hand, among participants with no hypothyroidism, 10(7.2%) got menarche below 11 years old, 124(89.2%) between 11-15 years and 3(3.6%) above 15 years. Regarding period of menses, Among 21 hypothyroidism cases, 8(38.1%) had period < 7 days, 12(57.1%) had 7-9 days and 1(4.8%) had period >9 days. On the other hand, among participants with no hypothyroidism, 69(43.1%) had period < 7 days, 64(46.0%) had 7-9 days and 14(10.1%) had period >9 days. There was high significant correlation between age of menarche and hypothyroidism ( $P=0.007$ ) but there was no relation between hypothyroidism and period of menses ( $P=0.559$ ).

**Table 3. Relationship between thyroid problems and abnormal uterine bleeding in the studied women**

Thyroid problems	Abnormal uterine bleeding		Total	P value
	No (n=144)	Yes (n=16)		
Hypothyroidism	17 11.8%	4 25.0%	21 13.1%	0.003
Hyperthyroidism	0 0.0%	1 6.2%	1 .6%	
No	127 88.2%	11 68.8%	138 86.2%	

**Table 4. Relationship between hypothyroidism and age of menarche and period of menses in the studied women, Arar, 2017**

Age of menarche	Hypothyroidism		Total (n=160)	P value
	Yes (n=21)	No (n=139)		
>11	3 14.3%	10 7.2%	13 8.1%	
11-	14 66.7%	124 89.2%	138 86.2%	
15+	4 19.0%	5 3.6%	9 5.6%	
Period of menses				
< 7	8 38.1%	61 43.9%	69 43.1%	0.559
7-9	12 57.1%	64 46.0%	76 47.5%	
>9	1 4.8%	14 10.1%	15 9.4%	

## DISCUSSION

Menstrual problems account for much of the morbidity, affecting one in every five women during their life span (Abid, 2014). Thyroid dysfunction is associated with a range of menstrual abnormalities, including oligomenorrhea, amenorrhea, and menorrhagia. This study was conducted in Northern Saudi Arabia, among 160 randomly selected participants (General female population of Northern Saudi Arabia, KSA). The aim of the study is to study the menstrual pattern in the studied women and to study the effect of thyroid disorders on the menstrual pattern among the affected women. Regarding Thyroid problems; our study reported 13.1% of studied women had Hypothyroidism and only 0.6% had Hyperthyroidism. 7.5% of hypothyroidism cases had menstrual irregularity but only 1.1% of hyperthyroidism cases reported menstrual irregularity. There was a significant correlation between menstrual irregularity and thyroid problems ( $P=0.03$ ). Benson and Dailey (Benson, 1955) found that out of 221 hyperthyroid patients 58% had oligomenorrhea or amenorrhea and 5% polymenorrhea. This is in general

agreement with other older studies such as those of Goldsmith et al (Goldsmith, 1952). More recently, in India Joshi et al (Joshi, 1993), found menstrual irregularities in 64.7% of hyperthyroid women, compared to 17.2% of healthy controls. These irregularities sometimes preceded thyroid dysfunction. However, Krassas et al (Krassas, 1994), found irregular cycles in only 21.5% out of 214 thyrotoxic patients. Hypothyroidism causes several abnormalities, mainly polymenorrhea and menorrhagia, but also anovulation and more rarely amenorrhea (Thomas, 1987). In an Indian study, 68.2% of hypothyroid women had menstrual abnormalities, compared to 12.2% of healthy controls (Josch, 1993).

In the study done by Krasses et al (Joshi, 1993), the prevalence of menstrual irregularities (mainly oligomenorrhea) reached 23% among 171 hypothyroid patients, while being only 8% in 214 controls ( $p<0.05$ ). Another study reported irregular menstrual cycles, mainly amenorrhea, in 31% of the cases with hypothyroidism (Goswami, 2009). Increased sex hormone-binding globulin is characteristic of hyperthyroidism (Rosner, 1990). So, globulin is used as a test of thyroid function, reflecting the tissue response to the thyroid hormones (Akande, 1975). In pre-pubertal girls menstruation has been reported to be delayed (Longcope, 1991 and Thomas, 1987) and in women of fertile age with hyperthyroidism oligomenorrhea (decreased menstrual flow) is the most common abnormality. In hypothyroidism, the serum prolactin (PRL) level may be increased (Goswami, 2009; Edwards, 1971; Longcope, 1991 and Tolino, 1991). This may be due to the fact that the hypothalamic-releasing hormone (TRH) increases the secretion of both thyroid-stimulating hormone (TSH) and PRL (Edwards, 1971). Our study found no relation between hypothyroidism and age of menarche. In women of fertile age, hypothyroidism causes several abnormalities, mainly polymenorrhea and menorrhagia, but also anovulation and more rarely amenorrhea (Goswami, 2009; Edwards, 1971; Goldsmith, 1952; Daniels, 1995). In an Indian study, 68.2% of hypothyroid women had menstrual abnormalities, compared to 12.2% of healthy controls (Daniels, 1995). In conclusion, thyroid function influences the menstrual cycle and affects reproductive activity, fertility, and pregnancy outcomes. For these reasons, investigation of thyroid function in women with abnormal menstrual activity should be performed. The prevalence of menstrual disturbances, including secondary amenorrhea, hypomenorrhea, oligomenorrhea, hypermenorrhea, polymenorrhea and irregular menstrual cycle, in patients with various thyroid diseases such as hyperthyroidism and hypothyroidism.

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