



Thyroid Function Abnormalities in Women with Abnormal Uterine Bleeding: A Hospital-Based Observational Study

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Abstract

Background: Abnormal uterine bleeding (AUB) is one of the most common gynecological complaints affecting women of reproductive and perimenopausal age groups. Thyroid hormones play a crucial role in maintaining normal reproductive and menstrual function. Thyroid dysfunction can alter menstrual cyclicity through effects on ovulation, endometrial development, hormone metabolism, and coagulation pathways, thereby contributing to abnormal uterine bleeding. **Aim:** To evaluate the role of thyroid dysfunction in women presenting with abnormal uterine bleeding and determine the prevalence and pattern of thyroid abnormalities among affected patients. **Materials and Methods:** A hospital-based cross-sectional observational study was conducted in the Department of Obstetrics and Gynecology at a tertiary care teaching hospital in Gujarat over a period of one year. A total of 120 women aged 18–50 years presenting with abnormal uterine bleeding were included. Detailed clinical history, physical examination, pelvic ultrasonography, complete blood count, and thyroid function tests (serum T3, T4, and TSH) were performed. The association between thyroid dysfunction and various menstrual bleeding patterns was analyzed using appropriate statistical tests. **Results:** The majority of participants belonged to the 36–45 years age group (35.0%), and 76.7% were multiparous. Menorrhagia was the most common bleeding pattern, accounting for 40.0% of cases. Thyroid dysfunction was identified in 35.0% of women, while 65.0% were euthyroid. Subclinical hypothyroidism was the most common thyroid abnormality (15.0%), followed by overt hypothyroidism (10.0%), hyperthyroidism (6.7%), and subclinical hyperthyroidism (3.3%). A statistically significant association was observed between thyroid dysfunction and abnormal uterine bleeding patterns ($\chi^2 = 13.84$, $p = 0.031$). Thyroid dysfunction was most frequently associated with amenorrhea with breakthrough bleeding (75.0%), menorrhagia (50.0%), and oligomenorrhea (50.0%). Women with hypothyroidism also had lower mean hemoglobin levels compared with euthyroid women. **Conclusion:** Thyroid dysfunction, particularly subclinical hypothyroidism and overt hypothyroidism, is common among women presenting with abnormal uterine bleeding and shows a significant association with menstrual disturbances. Routine thyroid function screening in women with abnormal uterine bleeding may facilitate early diagnosis, appropriate treatment, improvement of menstrual symptoms, and prevention of unnecessary invasive interventions.

Keywords: Abnormal Uterine Bleeding; Amenorrhea; Hypothyroidism; Menorrhagia; Oligomenorrhea; Thyroid Dysfunction



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INTRODUCTION

Abnormal uterine bleeding (AUB) is one of the most common gynecological disorders affecting women of reproductive and perimenopausal age groups. The International Federation of Gynecology and Obstetrics (FIGO) defines AUB as bleeding from the uterine corpus that is abnormal in volume, regularity, frequency, or duration and occurs in the absence of pregnancy. AUB accounts for approximately one-third of gynecological outpatient visits and significantly impacts physical health, psychological well-being, social functioning, and quality of life. The prevalence of AUB among women of

reproductive age has been reported to range from 9% to 30% worldwide [1].

Normal menstrual function depends upon the coordinated interaction of the hypothalamic-pituitary-ovarian axis and various endocrine organs, particularly the thyroid gland. Thyroid hormones influence ovarian function, sex hormone metabolism, gonadotropin secretion, endometrial maturation, and reproductive physiology. Therefore, disturbances in thyroid function may lead to menstrual irregularities and abnormal uterine bleeding [2].

Thyroid disorders are among the most prevalent endocrine disorders in women and occur nearly 5–10 times more frequently in females than in males. Both hypothyroidism and hyperthyroidism have been associated with menstrual disturbances. Hypothyroidism commonly presents with menorrhagia, polymenorrhea, and anovulatory bleeding, whereas hyperthyroidism is frequently associated with oligomenorrhea and amenorrhea. These manifestations result from alterations in gonadotropin-releasing hormone secretion, ovulatory dysfunction, changes in estrogen metabolism, hyperprolactinemia, and coagulation abnormalities [3].

Several studies have demonstrated a significant relationship between thyroid dysfunction and abnormal uterine bleeding. Ajmani et al. evaluated women presenting with menstrual disorders and reported thyroid dysfunction in 44% of cases. Subclinical hypothyroidism was observed in 20%, overt hypothyroidism in 14%, hyperthyroidism in 8%, and subclinical hyperthyroidism in 2% of patients. The authors concluded that thyroid dysfunction is a major reversible cause of menstrual abnormalities and recommended routine thyroid screening in affected women [4].

Joshi et al. conducted a study among women with AUB and found thyroid dysfunction in 25% of patients. Hypothyroidism was the most common abnormality and was significantly associated with heavy menstrual bleeding. The study emphasized that early detection and treatment of thyroid disorders can improve menstrual symptoms and reduce the need for invasive interventions [5].

Similarly, Verma et al. reported thyroid dysfunction in 44% of women presenting with menstrual disorders. Menorrhagia was the most common menstrual complaint, occurring in 49% of patients, while approximately 65% of women with hypothyroidism presented with excessive menstrual bleeding. These findings further support the close association between thyroid dysfunction and abnormal uterine bleeding [6].

More recent studies have shown that the prevalence of thyroid dysfunction among women with AUB ranges from 20% to 44%. Saha et al. reported hypothyroidism in 16.6%, subclinical hypothyroidism in 18.5%, and hyperthyroidism in 5.7% of women presenting with abnormal uterine bleeding. Menorrhagia remained the most common bleeding pattern among patients with thyroid dysfunction [7].

Since thyroid dysfunction is a potentially reversible cause of abnormal uterine bleeding, its early identification and treatment can restore normal menstrual patterns, improve reproductive health, and prevent unnecessary hormonal therapy, endometrial procedures, and hysterectomy. Therefore, routine assessment of

thyroid function in women presenting with AUB is clinically important and may facilitate timely diagnosis and appropriate management [8].

The present study aims to evaluate the role of thyroid dysfunction in women presenting with abnormal uterine bleeding and to determine the prevalence and pattern of thyroid abnormalities among affected patients. The objectives of the study are to assess thyroid function status in women with abnormal uterine bleeding, identify the association between various menstrual bleeding patterns and thyroid dysfunction, and evaluate the distribution of hypothyroidism, subclinical hypothyroidism, hyperthyroidism, and euthyroid status among study participants. Since thyroid disorders are common, often underdiagnosed, and represent a potentially reversible cause of abnormal uterine bleeding, early identification may facilitate timely medical management and prevent unnecessary hormonal therapy, invasive diagnostic procedures, and hysterectomy. The findings of this study are expected to strengthen the evidence supporting routine thyroid function screening in women presenting with abnormal uterine bleeding, thereby improving diagnostic accuracy, guiding appropriate treatment strategies, reducing morbidity, enhancing reproductive health outcomes, and contributing to the development of cost-effective clinical management protocols in gynecological practice.

MATERIALS AND METHODS

The present study was designed as a hospital-based cross-sectional observational study conducted in the Department of Obstetrics and Gynecology at a tertiary care teaching hospital in Gujarat over a period of one year. The study included women presenting with complaints of abnormal uterine bleeding (AUB) in the outpatient and inpatient departments.

Women aged 18–50 years presenting with abnormal uterine bleeding, including menorrhagia, polymenorrhea, metrorrhagia, menometrorrhagia, and intermenstrual bleeding, were enrolled in the study. Pregnant women, patients with known coagulation disorders, women already receiving thyroid hormone replacement or antithyroid medications, patients on hormonal therapy, and those with diagnosed genital tract malignancies were excluded from the study.

A detailed clinical history including age, parity, menstrual history, duration and pattern of bleeding, medical history, and family history was obtained using a predesigned proforma. General physical examination, systemic examination, and gynecological examination were performed. Relevant investigations including complete blood count, pelvic ultrasonography, and thyroid function tests (serum T3, T4, and TSH levels) were conducted. Based on thyroid function test results, participants were categorized as euthyroid, hypothyroid,

subclinical hypothyroid, hyperthyroid, or subclinical hyperthyroid.

n = 7500 / 64
n = 117.18

Sample Size Calculation

The sample size was calculated using the formula:

$$n = \frac{4pq}{d^2}$$

Where:

- p = Prevalence of thyroid dysfunction among women with AUB = 25% (based on previous study [5])
- q = 100 – p = 75%
- d = Allowable error = 8%

Calculation:

$$n = (4 \times 25 \times 75) / (8^2)$$

Thus, the minimum required sample size was 118 participants. Considering possible incomplete data and non-response, the final sample size was rounded off to 120 women with abnormal uterine bleeding.

The collected data were entered into Microsoft Excel and analyzed using SPSS version 26.0. Continuous variables were expressed as mean ± standard deviation, while categorical variables were expressed as frequencies and percentages. The association between thyroid dysfunction and various patterns of abnormal uterine bleeding was assessed using the Chi-square test. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 120 women with abnormal uterine bleeding (AUB) were included in the study. The majority of participants belonged to the 36–45 years age group (35.0%), followed by 26–35 years (31.7%), while 76.7% were multiparous and 23.3% were nulliparous. Regarding body mass index, 43.3% were overweight, 38.3% had normal BMI, and 18.3% were obese.

Table 1: Demographic and Clinical Characteristics of Study Participants (n = 120)

Variable	Category	Frequency (n)	Percentage (%)
Age Group (Years)	18–25	22	18.3
	26–35	38	31.7
	36–45	42	35.0
	46–50	18	15.0
Parity	Nulliparous	28	23.3
	Multiparous	92	76.7
BMI (kg/m ²)	Normal	46	38.3
	Overweight	52	43.3
	Obese	22	18.3
Total		120	100

Among the various patterns of abnormal uterine bleeding, menorrhagia was the most common presentation, observed in 40.0% of women, followed by polymenorrhea (16.7%), menometrorrhagia (15.0%), metrorrhagia (11.7%), oligomenorrhea (8.3%), intermenstrual bleeding (5.0%), and amenorrhea with breakthrough bleeding (3.3%).

Figure 1: Distribution of Patterns of Abnormal Uterine Bleeding (n = 120)

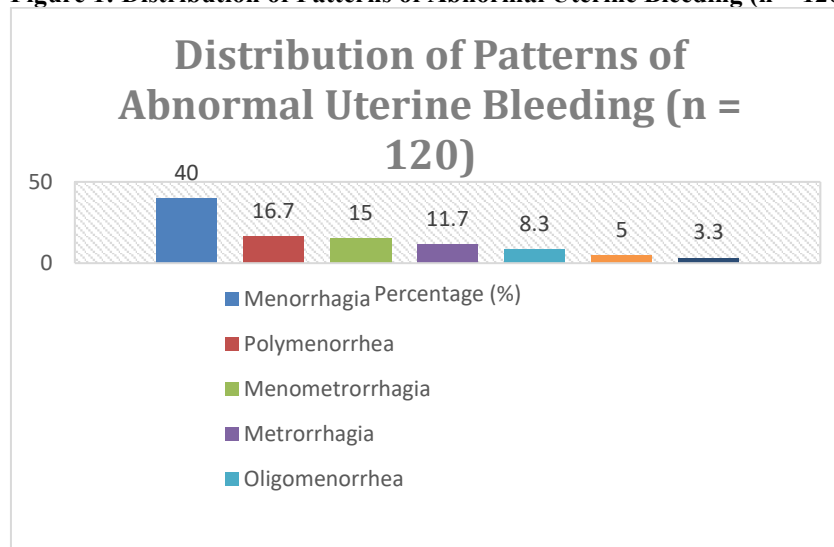
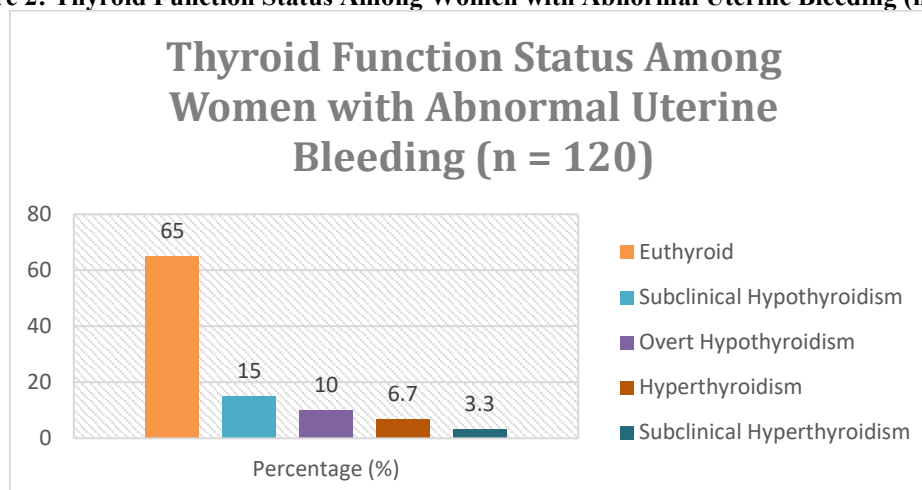


Figure 2: Thyroid Function Status Among Women with Abnormal Uterine Bleeding (n = 120)



Assessment of thyroid function revealed that 65.0% of participants were euthyroid, while 35.0% had thyroid dysfunction. Among thyroid abnormalities, subclinical hypothyroidism was the most common disorder (15.0%), followed by overt hypothyroidism (10.0%), hyperthyroidism (6.7%), and subclinical hyperthyroidism (3.3%). Thus, hypothyroid disorders collectively accounted for 25.0% of all study participants.

A significant association was observed between thyroid dysfunction and the pattern of abnormal uterine bleeding ($\chi^2 = 13.84$, $p = 0.031$). Thyroid dysfunction was most prevalent among women presenting with amenorrhea with breakthrough bleeding (75.0%), followed by menorrhagia (50.0%), oligomenorrhea (50.0%), and metrorrhagia (44.4%). Lower proportions of thyroid dysfunction were observed among women with polymenorrhea (30.0%), metrorrhagia (21.4%), and intermenstrual bleeding (16.7%).

Table 2: Association Between Thyroid Dysfunction and Pattern of Abnormal Uterine Bleeding (n = 120)

Pattern of AUB	Euthyroid n (%)	Thyroid Dysfunction n (%)	Total
Menorrhagia	24 (50.0)	24 (50.0)	48
Polymenorrhea	14 (70.0)	6 (30.0)	20
Menometrorrhagia	10 (55.6)	8 (44.4)	18
Metrorrhagia	11 (78.6)	3 (21.4)	14
Oligomenorrhea	5 (50.0)	5 (50.0)	10
Intermenstrual Bleeding	5 (83.3)	1 (16.7)	6
Amenorrhea with Breakthrough Bleeding	1 (25.0)	3 (75.0)	4
Chi-square Test		$\chi^2 = 13.84$	
p-value		0.031*	

*Statistically Significant ($p < 0.05$)

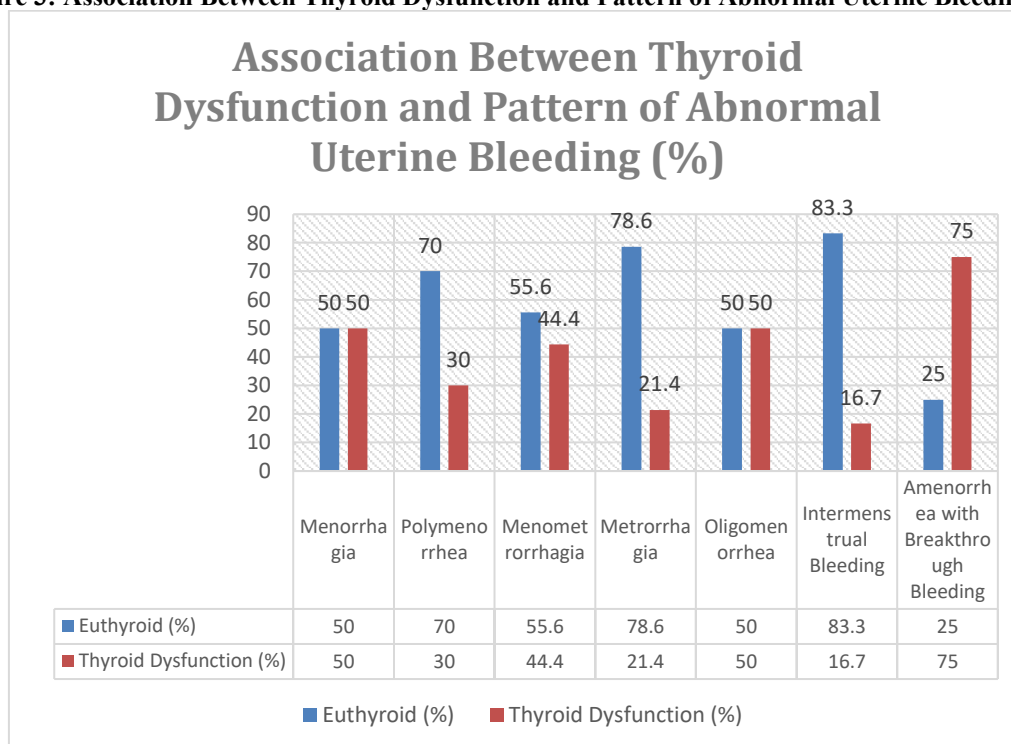
Further analysis demonstrated that women with thyroid dysfunction had lower mean hemoglobin levels compared with euthyroid women. The mean hemoglobin level was 11.2 ± 1.4 g/dL in euthyroid women, 10.1 ± 1.3 g/dL in subclinical hypothyroidism, and 9.4 ± 1.2 g/dL in overt hypothyroidism. Increasing serum TSH levels were associated with greater severity of menstrual abnormalities and anemia, and this association was found to be statistically significant ($p < 0.001$).

Table 3: Correlation of Thyroid Status with Severity of Abnormal Uterine Bleeding

Variable	Mean Hemoglobin (g/dL)	Mean TSH (mIU/L)	p-value
Euthyroid	11.2 ± 1.4	2.8 ± 1.1	Reference
Subclinical Hypothyroidism	10.1 ± 1.3	6.8 ± 1.5	<0.001
Overt Hypothyroidism	9.4 ± 1.2	12.6 ± 3.8	<0.001
Hyperthyroidism	10.8 ± 1.1	0.18 ± 0.07	0.002
Subclinical Hyperthyroidism	11.0 ± 1.2	0.32 ± 0.09	0.014

Overall, the study demonstrated that thyroid dysfunction, particularly hypothyroidism and subclinical hypothyroidism, is common among women presenting with abnormal uterine bleeding and is significantly associated with specific menstrual bleeding patterns, especially menorrhagia and amenorrhea with breakthrough bleeding. These findings support the routine evaluation of thyroid function in women presenting with abnormal uterine bleeding.

Figure 3: Association Between Thyroid Dysfunction and Pattern of Abnormal Uterine Bleeding (%)



DISCUSSION

Abnormal uterine bleeding (AUB) is a common gynecological complaint and thyroid dysfunction is increasingly recognized as an important endocrine factor influencing menstrual abnormalities. In the present study, thyroid dysfunction was identified in 35.0% of women presenting with AUB, while 65.0% were euthyroid. These findings are consistent with those reported by Nekkanti and V.K. [8], who observed thyroid dysfunction in 32.3% of women with AUB. Similarly, Islam and Maqsood [9] reported thyroid abnormalities in 35% of women presenting with menstrual irregularities, demonstrating a prevalence almost identical to that observed in the present study. These findings reinforce the significant association between thyroid dysfunction and abnormal uterine bleeding.

The majority of women in the present study belonged to the 36–45 years age group (35.0%), indicating that AUB is more common during the late reproductive and perimenopausal years. Similar age distributions were reported by M. and Kaur [10], who found the highest incidence of AUB among women aged 31–45 years. The increased prevalence of menstrual abnormalities during this period may be attributed to hormonal fluctuations, declining ovarian reserve, and increasing endocrine disturbances.

Menorrhagia was the most common bleeding pattern observed in the present study, accounting for 40.0% of all cases. Comparable findings were reported by M. and Kaur [10], who observed menorrhagia in 42.5% of women with AUB. The predominance of menorrhagia

across studies suggests a strong association between thyroid abnormalities and excessive menstrual blood loss.

In the present study, subclinical hypothyroidism (15.0%) was the most common thyroid abnormality, followed by overt hypothyroidism (10.0%), hyperthyroidism (6.7%), and subclinical hyperthyroidism (3.3%). Similar findings were reported by Nekkanti and V.K. [8], who identified subclinical hypothyroidism as the most common thyroid disorder among women with AUB. Islam and Maqsood [10] reported hypothyroidism in 20%, subclinical hypothyroidism in 10%, and hyperthyroidism in 5% of women with menstrual irregularities. Hannah et al. [11] also demonstrated that hypothyroidism was significantly associated with menstrual disturbances, particularly menorrhagia and oligomenorrhea, emphasizing the role of thyroid hormones in menstrual regulation.

A statistically significant association between thyroid dysfunction and menstrual bleeding patterns was observed in the present study ($\chi^2 = 13.84$, $p = 0.031$). Thyroid dysfunction was most frequent among women with amenorrhea with breakthrough bleeding (75.0%), followed by menorrhagia (50.0%) and oligomenorrhea (50.0%). Similar observations were reported by Hema. et al. [12], who found that hypothyroidism was significantly associated with menorrhagia, while hyperthyroidism was more commonly associated with oligomenorrhea and infrequent menstrual cycles. Hannah et al. [11] reported menstrual irregularities in more than half of women with hypothyroidism and

demonstrated a significant correlation between elevated TSH levels and abnormal menstrual patterns.

The present study demonstrated lower mean hemoglobin levels among women with hypothyroidism compared with euthyroid women. This finding likely reflects the chronic excessive menstrual blood loss associated with hypothyroid-related menorrhagia. Fatema et al. [13] similarly observed that women with thyroid dysfunction frequently presented with anemia secondary to prolonged and heavy menstrual bleeding. Their study further highlighted the importance of evaluating thyroid status in women presenting with unexplained anemia and menstrual disorders.

The relationship between thyroid dysfunction and endometrial pathology has also been highlighted in recent literature. Sahu et al. [14] demonstrated a significant association between thyroid abnormalities, endometrial thickness, and histopathological changes in women with AUB. The authors reported that proliferative and disordered proliferative endometrium were more frequently observed among women with thyroid dysfunction, suggesting a possible pathophysiological link between altered thyroid hormone levels and endometrial development. These findings support the biological plausibility of thyroid dysfunction contributing to abnormal uterine bleeding.

Recent prospective evidence provided by Pooja and Choudary [15] further supports the findings of the present study. They reported thyroid abnormalities in approximately one-third of women with AUB and concluded that routine thyroid function assessment significantly improved diagnostic accuracy and facilitated timely medical management. Their findings are in close agreement with the current study, which demonstrated thyroid dysfunction in 35.0% of participants.

Overall, the findings of the present study are consistent with contemporary literature and confirm that thyroid dysfunction, particularly subclinical hypothyroidism and overt hypothyroidism, is frequently associated with abnormal uterine bleeding. The significant prevalence of thyroid abnormalities and their association with menstrual disturbances emphasize the importance of routine thyroid function testing in women presenting with AUB. Early diagnosis and treatment of thyroid disorders may restore normal menstrual function, reduce anemia, improve quality of life, and prevent unnecessary hormonal therapy and surgical interventions.

CONCLUSION

The present study demonstrated that thyroid dysfunction is a common endocrine abnormality among women presenting with abnormal uterine bleeding, with an overall prevalence of 35.0%. Subclinical hypothyroidism (15.0%) was the most common thyroid disorder,

followed by overt hypothyroidism (10.0%), hyperthyroidism (6.7%), and subclinical hyperthyroidism (3.3%). Menorrhagia was the predominant bleeding pattern, accounting for 40.0% of cases. A statistically significant association was observed between thyroid dysfunction and various patterns of abnormal uterine bleeding ($\chi^2 = 13.84$, $p = 0.031$), indicating that thyroid abnormalities play an important role in menstrual disturbances. Women with hypothyroidism also demonstrated lower hemoglobin levels, suggesting a greater burden of chronic menstrual blood loss and anemia. The findings highlight that thyroid dysfunction, particularly hypothyroidism and subclinical hypothyroidism, represents a potentially reversible cause of abnormal uterine bleeding. Early diagnosis and appropriate treatment of thyroid disorders may restore normal menstrual function, improve quality of life, reduce anemia, and prevent unnecessary hormonal therapy and surgical interventions.

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