

International Journal of Radiology and Diagnostic Imaging



E-ISSN: 2664-4444
P-ISSN: 2664-4436
www.radiologypaper.com
IJRDI 2021; 4(4): 43-46
Received: 21-08-2021
Accepted: 24-09-2021

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Evaluating and comparing the efficacy of histopathology to TVS/TAS in diagnosing the abnormal uterine bleeding: A prospective clinical study

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DOI: <http://dx.doi.org/10.33545/26644436.2021.v4.i4a.238>

Abstract

Background: AUB (Abnormal Uterine Bleeding) is any bleeding outside normal frequency, regularity, duration, and volume. Abnormal bleeding in menstruation is depicted using terms such as oligomenorrhea, Polymenorrhea, Metorrhagia, and menorrhagia.

Objectives: The present clinical study was conducted to assess the efficacy of histopathological findings and TVS/TAS in subjects with AUB.

Methods: In the present prospective clinical study, 102 subjects within the age of 21-85 years with abnormal uterine bleeding. All subjects underwent hysteroscopy and premenstrual dilatation and curettage despite sonography findings and baseline investigations. The obtained endometrial tissue was assessed via histopathological examination.

Result: Cervical carcinoma, Endometrial carcinoma, Cervical polyp, Endometrial polyp, Adenomyosis, and Myoma as seen in 3.92% (n = 4), 12.74% (n = 13), 2.94% (n = 3), 32.35% (n = 33), 51.96% (n = 53), and 54.90% (n = 56) study subjects respectively. Tissue findings in the study were assessed as Cervical Carcinoma, Endometrial Carcinoma, Endometrial polyp, Endometritis, Atrophic endometrium, Mixed, Secretory, Proliferative phase, Endometrial hyperplasia, and normal epithelium was seen in 1.96% (n = 2), 10.78% (n = 11), 5.88% (n = 6), 0.98% (n = 1), 2.94% (n = 3), 3.92% (n = 4), 15.68% (n = 16), 11.76% (n = 12), 25.49% (n = 26), and 20.58% (n = 21) subjects respectively.

Conclusion: The present study concludes that transvaginal/transabdominal ultrasounds are an economical and primary assessment tool for screening of AUB, and must be included in routine assessment and examination. Although, the diagnosis and management of AUB are confusing among non-gravid females, however, histopathologic assessment is the gold standard in such cases.

Keywords: Abnormal Uterine Bleeding (AUB), adenomyosis, endometrial polyp, myoma, non-gravid

Introduction

The diagnosis and management of AUB are confusing among non-gravid females of reproductive age owing to inappropriately applied naming and scarcity of categorizing and investigating standard methods to assess AUB of different etiologies^[1]. Acute AUB is a bleeding episode in non-pregnant females of reproductive age in quantities that need immediate intervention to limit further loss of the blood, whereas, chronic AUB is abnormal bleeding in volume, frequency, and/or duration from the uterine corpus, and is consistent for at least past 6 months^[1].

A classification system of 2011, PALM-COEIN was given for etiologies of AUB in non-gravid females of reproductive age to establish standard investigations, diagnostics, and terminologies for AUB. This classification system has 9 categories based on PALM-COEIN (pronounced "Pahm-Koin"): polyp; Adenomyosis; leiomyomas; malignancy and hyperplasia; coagulopathy; ovulatory dysfunction; endometrial; iatrogenic; and not yet classified. Generally, PALM group components are measured visually using histopathology and imaging methods and are discrete. The components belonging to the COEIN group relate to entities that are not identified histopathologically or by imaging^[2].

Ultrasound is considered an appropriate tool for screening and is usually the first performed investigation in females with AUB. The First performed investigation in AUB cases is

transvaginal ultrasound which is not 100% sensitive even in ideal cases owing to detection difficulty due to small lesions and polyps. However, office hysteroscopy is available it can be advantageous as they can be removed in a single appointment. In subjects where hysteroscopy is not feasible like in virginal women and adolescent females, hysteroscopy, SIS, and TVUS may not be beneficial [3].

Adenomyosis has varied prevalence with a range of 5-70% which might be a reason for inconsistencies in the histopathologic criteria for diagnosis. Generally, these criteria have been based on histopathologic evaluation of the depth of "endometrial" tissue beneath the endometrial-myometrial interface, as determined via hysterectomy. Histopathologic criteria differ largely and diagnosis of adenomyosis from hysteroscopy specimens is limited in the classification system. Also, adenomyosis is included in the classification system as both MRI-based and sonographic criteria for diagnosis exists [4].

Based on FIGO (International Federation of Gynecology and Obstetrics) criteria, endometrial cancer is staged both surgically and pathologically. MRI preoperatively is done to assess subjects having an extrauterine extension of disease, enlarged pelvic nodes, and deep myometrial invasion that can affect the surgical extent. In subjects with no locally/systemically identifiable cause for AUB, the term DUB was used earlier. However, DUB is not used now as it is not included in the classification system. Recently, in such subjects, the cause found commonly is a primary or secondary disturbance in local endometrial homeostasis, the disorder of ovulation, and one or a combination of coagulopathy [5]. The present study was conducted to assess the role of sonography as a diagnostic tool in subjects with abnormal uterine bleeding and its correlation was established to histopathologic findings.

Materials and Methods

The present study was conducted to assess the role of sonography as a diagnostic tool in subjects with abnormal uterine bleeding and its correlation was established to histopathologic findings.

The present study was conducted at Department of Radio Diagnosis, Maharajah's Institute of Medical Sciences, Nellimarla, Vizianagaram, Andhra Pradesh, India after obtaining clearance from the concerned Ethical committee.

The study population was comprised of the subjects visiting the Department of Obstetrics and Gynecology of the institute with abnormal uterine bleeding. The study included a total of 102 subjects from both genders within the age range of 30-78 years. The exclusion criteria were subjects having AUB with adnexal pathology.

After final inclusion, the included subjects were examined in detail concerning gynecological (per speculum, per vaginal), systemic, physical, and general examination along with detailed history recording. This was followed by general and specific investigations in all subjects. All subjects underwent hysteroscopy and premenstrual dilatation and curettage despite sonography findings and

baseline investigations. The obtained endometrial tissue was assessed via histopathological examination.

Verbal and written consent was taken from all included study subjects. Treatment was planned based on sonography findings, medical conditions, desire to have further pregnancy, parity, and age. Following primary data collection, the collected data were subjected to the statistical evaluation using SPSS software version 21 (Chicago, IL, USA) and one-way ANOVA for results formulation. The data were expressed in percentage and number, and mean and standard deviation. The level of significance was kept at $p < 0.05$.

Results

The present study was conducted to assess the role of sonography as a diagnostic tool in subjects with abnormal uterine bleeding and its correlation was established to histopathologic findings. The study included a total of 102 subjects from both genders within the age range of 30-78 years. The demographic characteristics of the study subjects are listed in Table 1. The majority of study subjects were within the age range of 41-50 years with 61.76% ($n = 63$) subjects. In 31-40 years, there were 17.64% ($n = 18$) subjects, 51-60 years, there were 11.76% ($n = 12$) subjects, and in 61-72 years, there were 8.82% ($n = 9$) study subjects. Menstrual pattern was PMB, IMB, HPMB, and HMB in 12.74% ($n = 13$), 20.58% ($n = 21$), 32.35% ($n = 33$), and 34.31% ($n = 35$) study subjects respectively.

Table 1: Demographic characteristics and Menstrual pattern in the study subjects

Characteristics	%	N
Age groups		
31-40	17.64	18
41-50	61.76	63
51-60	11.76	12
61-72	8.82	9
Menstrual pattern		
PMB	12.74	13
IMB	20.58	21
HPMB	32.35	33
HMB	34.31	35
Total	100	102

Concerning histopathologic findings, myoma was the most common finding seen in 18.62% ($n = 19$) study subjects followed by Myoma+ Adenomyosis 16.66% ($n = 17$) study subjects, adenomyosis in 14.70% ($n = 15$) study subjects, and Polyp+ Adenomyosis in 12.74% ($n = 13$) study subjects. Other histopathologic findings were Myoma+ polyp+ Adenomyosis in 7.84% ($n = 8$) study subjects, Adenomyosis+ endometrial carcinoma in 0.98% ($n = 1$) study subjects, and Polyp+ endometrial carcinoma in 1.96% ($n = 2$) study subjects. Myoma+ cervical carcinoma, Myoma+ endometrial carcinoma, Myoma+ polyp, Cervical carcinoma, Endometrial carcinoma, Endometrial carcinoma, and Endometrial polyp in 1.96% ($n = 2$), 3.92% ($n = 4$), 5.88% ($n = 6$), 0, 6.86% ($n = 7$), 1.96% ($n = 2$), and 5.88% ($n = 6$) study subjects respectively (Table 2).

Table 2: Histopathologic findings in the study subjects

Histopathologic findings	%	N
Myoma+ polyp+ Adenomyosis	7.84	8
Adenomyosis+ endometrial carcinoma	0.98	1
Polyp+ endometrial carcinoma	1.96	2
Polyp+ Adenomyosis	12.74	13
Myoma+ cervical carcinoma	1.96	2
Myoma+ endometrial carcinoma	3.92	4
Myoma+ polyp	5.88	6
Myoma+ Adenomyosis	16.66	17
Cervical carcinoma	0	0
Endometrial carcinoma	6.86	7
Endometrial carcinoma	1.96	2
Endometrial polyp	5.88	6
Adenomyosis	14.70	15
Myoma	18.62	19
Total	100	102

The correlation of histopathologic findings on ultrasonography and histopathology was also assessed in the present study. It was seen that no normal sample was seen histopathologically, whereas, 36 subjects were found to be normal on ultrasonography, this was statistically significant ($p < 0.0001$). Other findings were found to be differing non-significantly between histopathology and ultrasonography with p-values of 0.32, 0.64, 0.83, 0.46, 0.84, 0.58, 0.55, 0.88, 0.51, 0.76, and 0.95 respectively for Myoma+ polyp+ Adenomyosis, Adenomyosis+ endometrial carcinoma, Polyp+ endometrial carcinoma, Polyp+ Adenomyosis, Myoma+ cervical carcinoma, Myoma+ endometrial carcinoma, Myoma+ polyp, Myoma+ Adenomyosis, Endometrial carcinoma, Endometrial polyp, and Myoma respectively (Table 3).

Table 3: Correlation of Histopathologic findings and ultrasonography in the study

Histopathologic findings	Histopathology	Ultrasonography	p-value
Myoma+ polyp+ Adenomyosis	9	5	0.32
Adenomyosis+ endometrial carcinoma	1	0	0.64
Polyp+ endometrial carcinoma	3	2	0.83
Polyp+ Adenomyosis	13	6	0.46
Myoma+ cervical carcinoma	2	1	0.84
Myoma+ endometrial carcinoma	5	2	0.58
Myoma+ polyp	7	3	0.55
Myoma+ Adenomyosis	17	15	0.88
Cervical carcinoma	0	0	-
Endometrial carcinoma	16	9	0.42
Endometrial polyp	4	3	0.76
Myoma	19	17	0.95
Normal	0	36	<0.0001

The present study also assessed uterine pathologies as Cervical carcinoma, Endometrial carcinoma, Cervical polyp, Endometrial polyp, Adenomyosis, and Myoma as seen in 3.92% ($n = 4$), 12.74% ($n = 13$), 2.94% ($n = 3$), 32.35% ($n = 33$), 51.96% ($n = 53$), and 54.90% ($n = 56$) study subjects respectively. Tissue findings in the study were assessed as Cervical Carcinoma, Endometrial

Carcinoma, Endometrial polyp, Endometritis, Atrophic endometrium, Mixed, Secretary, Proliferative phase, Endometrial hyperplasia, and normal epithelium was seen in 1.96% ($n = 2$), 10.78% ($n = 11$), 5.88% ($n = 6$), 0.98% ($n = 1$), 2.94% ($n = 3$), 3.92% ($n = 4$), 15.68% ($n = 16$), 11.76% ($n = 12$), 25.49% ($n = 26$), and 20.58% ($n = 21$) subjects respectively (Table 4).

Table 4: Pathologic findings in the study subjects with AUB

Findings	Pathology	%	N
Uterine pathologies	Cervical carcinoma	3.92	4
	Endometrial carcinoma	12.74	13
	Cervical polyp	2.94	3
	Endometrial polyp	32.35	33
	Adenomyosis	51.96	53
	Myoma	54.90	56
Tissue results	Cervical Carcinoma	1.96	2
	Endometrial Carcinoma	10.78	11
	Endometrial polyp	5.88	6
	Endometritis	0.98	1
	Atrophic endometrium	2.94	3
	Mixed	3.92	4
	Secretary	15.68	16
	Proliferative phase	11.76	12
	Endometrial hyperplasia	25.49	26
	Normal Endometrium	20.58	21

Discussion

The present study was conducted to assess the role of sonography as a diagnostic tool in subjects with abnormal uterine bleeding and its correlation was established to

histopathologic findings. The study included a total of 102 subjects from both genders within the age range of 30-78 years. The majority of study subjects were within the age range of 41-50 years with 61.76% ($n = 63$) subjects.

Myoma was the most common finding seen in 18.62% (n = 19) study subjects followed by Myoma+ Adenomyosis 16.66% (n = 17) study subjects, adenomyosis in 14.70% (n = 15) study subjects, and Polyp+ Adenomyosis in 12.74% (n = 13) study subjects. Other histopathologic findings were Myoma+ polyp+ Adenomyosis in 7.84% (n = 8) study subjects, Adenomyosis+ endometrial carcinoma in 0.98% (n = 1) study subjects, and Polyp+ endometrial carcinoma in 1.96% (n = 2) study subjects. Myoma+ cervical carcinoma, Myoma+ endometrial carcinoma, Myoma+ polyp, Cervical carcinoma, Endometrial carcinoma, Endometrial carcinoma, and Endometrial polyp in 1.96% (n = 2), 3.92% (n = 4), 5.88% (n = 6), 0, 6.86% (n = 7), 1.96% (n = 2), and 5.88% (n = 6) study subjects respectively. These findings were similar to the findings of Rizvi G *et al.* [6] in 2013 and Espindola D *et al.* [7] in 2007 where authors reported similar findings in their study.

The correlation of histopathologic findings on ultrasonography and histopathology was also assessed in the present study. It was seen that no normal sample was seen histopathologically, whereas, 36 subjects were found to be normal on ultrasonography, this was statistically significant ($p < 0.0001$). Other findings were found to be differing non-significantly between histopathology and ultrasonography with p-values of 0.32, 0.64, 0.83, 0.46, 0.84, 0.58, 0.55, 0.88, 0.51, 0.76, and 0.95 respectively for Myoma+ polyp+ Adenomyosis, Adenomyosis+ endometrial carcinoma, Polyp+ endometrial carcinoma, Polyp+ Adenomyosis, Myoma+ cervical carcinoma, Myoma+ endometrial carcinoma, Myoma+ polyp, Myoma+ Adenomyosis, Endometrial carcinoma, Endometrial polyp, and Myoma respectively. These results were consistent with the results of Woolcock AG *et al.* [8] in 2007 and Talukdar B *et al.* [9] in 2016 where authors showed similar histopathologic findings.

The present study also assessed uterine pathologies as Cervical carcinoma, Endometrial carcinoma, Cervical polyp, Endometrial polyp, Adenomyosis, and Myoma as seen in 3.92% (n = 4), 12.74% (n = 13), 2.94% (n = 3), 32.35% (n = 33), 51.96% (n = 53), and 54.90% (n = 56) study subjects respectively. Tissue findings in the study were assessed as Cervical Carcinoma, Endometrial Carcinoma, Endometrial polyp, Endometritis, Atrophic endometrium, Mixed, Secretory, Proliferative phase, Endometrial hyperplasia, and normal epithelium was seen in 1.96% (n = 2), 10.78% (n = 11), 5.88% (n = 6), 0.98% (n = 1), 2.94% (n = 3), 3.92% (n = 4), 15.68% (n = 16), 11.76% (n = 12), 25.49% (n = 26), and 20.58% (n = 21) subjects respectively. These results were consistent with the studies by Bhavani N *et al.* [10] in 2015 and Dueholm M [11] in 2006 where similar uterine pathologies and tissue findings were reported by the authors as in the present study.

Conclusion

Within its limitations, the present study concludes that AUB was commonly seen in females of age 40-51 years with etiologic factors being pathologies (benign and malignant) to medical conditions. The most common AUB was chronic with histopathology showing normal endometrium to carcinoma endometrium. Compared to the sonography, histopathology was found to be more sensitive in the assessment and screening of subjects with AUB. However, the present study had a few limitations including a smaller sample size, geographical area biases, shorter monitoring

period, retrospective nature, and single-institution nature. Hence, further longitudinal studies with a larger sample size and longer monitoring period are required to reach a definitive conclusion.

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