

Research Article



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**EVALUATING USEFULNESS AND FUNCTIONAL EFFICACY OF MRI AS A DIAGNOSTIC TOOL FOR WOMEN WHO HAVE IRREGULAR MENSTRUAL FLOW BUT NO GRAVIDITY**

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**ABSTRACT**

**Background:** there are many distinct and complex causes of irregular uterine bleeding, as well as differential diagnoses. Histopathologic analyses are seen as debatable by tav and tas, which makes mri, a non-invasive, cutting-edge imaging modality, a trustworthy tool for accurately diagnosing irregular uterine haemorrhage.

**Aim:** The purpose of this study was to evaluate the use and effectiveness of MRI in patients with abnormal uterine bleeding (AUB).

**Methods:** after documenting a thorough history and doing a systemic examination, 102 patients with abnormal uterine bleeding who were between the ages of 21 and 85 who had undergone previous surgery were evaluated in this prospective clinical research. All of the individuals then had mris after this. The MRI diagnosis, underlying medical issues, age, parity, and the desire for more pregnancies all played a role in the treatment approach.

**Result:** The majority of participants were between the ages of 31 and 50, with a parity of 2. Study participants' duration complaints were acute for less than six months in 22.54% (n = 23) of them, and chronic for more than six months in 77.45% (n = 79) of them. In 11.76% (n=12), 20.58% (n=21), 32.35% (n=33), and 35.29% (n=36) of the research patients, the bleeding pattern was PMB, IMB, HPMB, and HMB. In 9.80% (n=10), 15.68% (n=16), 10.78% (n=11), 14.70% (n=15), 12.74% (n=13), and 19.60% (n=20) of the research participants, pressure symptoms, dysmenorrhea, dyspareunia, discharge per viginum, heaviness in the lower abdomen, and pain in the lower abdomen were reported, respectively. Out of the five research respondents, 4.90% claimed no compliance.

**Conclusion:** The present study concludes that in subjects where clinical diagnosis is not confirmatory, sonography is decisive, even in subjects with no symptoms and normal findings. MRI is an accurate and promising imaging modality.

**Keywords:** Abnormal uterine bleeding (AUB), abnormal menstrual bleeding (AMB), parity, adenomyosis, magnetic resonance imaging (MRI)

**INTRODUCTION**

Any bleeding that is not consistent with normal frequency, regularity, length, or volume is referred to as abnormal uterine bleeding, or AUB. Menorrhagia, polymenorrhea, metorrhagia, and oligomenorrhea are some of the words used to describe abnormal bleeding during menstruation. The causes of irregular uterine bleeding are many, diverse, and have a difficult differential diagnosis. Uterine synechia, coagulation deficiencies, OC pills, PCOS, IUCD, polyps, uterine and/or cervical infection, fibroids, Adenomyosis, ectopic pregnancy, miscarriage, and pregnancy are the causative factors that cause irregular uterine bleeding.<sup>1</sup>

One of the most frequent presentations of adenocarcinoma, endometrial hyperplasia (precancerous), uterine tumours, vaginal cancers, and cervical malignancies is abnormal uterine bleeding. Determining the specific etiologic cause causing AUB is therefore essential. To get a conclusive diagnosis for AUB, a thorough and

vigilant history taking along with a clinical examination, endometrial sample, MRI, hysteroscopy, sonohysterography, ultrasonography, hormonal profile, and blood tests might be used.<sup>2</sup> Because there are no standardised methodologies, the terminology used to categorise and investigate AUB and related aetiologies is uneven and ambiguous, which limits management and research of AUB in nonpregnant female patients in the reproductive age group.<sup>3</sup> The 2011 FIGO classification system listed nine primary categories based on the term PALM-COIN (pronounced "palm-koin"),<sup>4</sup> which describes endometrial, iatrogenic, polyp, polyadenomyosis, leiomyomas, malignancy and hyperplasia, coagulopathy, ovulatory dysfunction, and not yet classified. Generally, PALM group components are distinct and assessed visually by imaging and histology techniques.<sup>5</sup> The elements that comprise the COIN group pertain to entities that cannot be recognised by histopathology or imaging.<sup>6</sup>

Transvaginal ultrasonography is the first test carried out in instances with AUB, although even in the best of circumstances, it is not 100% sensitive due to the difficulties in detecting tiny lesions and polyps.<sup>7</sup> Nonetheless, office hysteroscopy is a viable option that offers the benefit of removing them in a one visit. When hysteroscopy is impractical, such as in the case of teenage girls and virgins, MRI can be helpful.<sup>8</sup> Women with TUVS and fibroids should think about getting an MRI. By enabling the removal of fibroids by hysteroscopy, MRI precision can prevent the need for a hysterectomy. When ultrasonography is not helpful in diagnosing worrisome instances of adenomyosis, MRI should be taken into consideration.<sup>9</sup>

An accurate imaging result helps to design the surgical approach, perform the surgery, and assess the patient after the procedure.<sup>7</sup> Atypical hyperplasia and malignancy are probable causes of AUB in females of reproductive age. Endometrial cancer, benign polyps, and hyperplasia may show up together on an MRI and might be relevant for biopsy staging.<sup>10</sup>

The benefits of magnetic resonance imaging (MRI) are its non-invasiveness, multiplanar imaging, tissue differentiation skills, and contrast alteration capacity. Also highly sensitive to blood flow is MRI. MRI may also be used to evaluate the biochemical blood status, speed, and flow direction. MRI may be used as an alternative or complement with a number of other techniques. The purpose of the current study was to evaluate the utility and effectiveness of MRI in individuals with abnormal uterine bleeding (AUB).

## **MATERIALS AND METHODS**

The goal of the current prospective analytical investigation was to evaluate the use and effectiveness of MRI in patients with abnormal uterine bleeding (AUB). The participants with abnormal uterine bleeding who visited the institute's Department of Obstetrics and Gynaecology made up the study population. A total of 102 participants, spanning the ages of 30 to 78, were involved in the research and underwent surgery. The participants with adnexal pathology and AUB were excluded.

Following their final inclusion, the participants underwent comprehensive examinations encompassing gynaecological (per speculum, vaginal), systemic, physical, and general examinations, as well as a thorough history taking. Investigations, both general and specialised, were conducted in all disciplines after this. All included subjects irrespective of ultrasound findings and baseline investigations underwent MRI of the pelvis region.

Dilatation and curettage were performed following MRI. After the screening, 20 individuals were not included since their MRI results were normal. Every research participant who was included gave their verbal and written agreement. Based on the patient's age, parity, medical issues, and desire for more pregnancies, a treatment plan was devised. With less than 25 seconds to localise and arrange the sequences, 1.5 Tesla MRI was used in three planes. The scans were performed using weighted low-resolution T1 and T2 images.

Every research subject was monitored for a period of four weeks. To determine the best course of action and evaluate any histopathologic problems, a first follow-up was conducted at week one and a second follow-up at week four.

After initial data collection, the data were statistically evaluated using SPSS software version 21 (Chicago, IL, USA), with one-way ANOVA used to formulate the results. The data were presented as a mean, standard deviation, percentage, and number. At  $p < 0.05$ , the significance threshold was maintained.

## **RESULTS**

The goal of the current prospective analytical investigation was to evaluate the use and effectiveness of MRI in patients with abnormal uterine bleeding (AUB). Table 1 shows the demographic details of the research participants. 16.66% (n=17) of the participants were in the age range of 31–40 years, 61.76% (n=63) in the age group of 41–50 years, 10.78% (n=11) in the age group of 51–60 years, and 10.78% (n=11) in the age group of 61–72 years.

Concerning parity, The percentage of female individuals with 0 parity was 26.47% (n = 27), parity 1 was 11.76% (n = 12), parity 2 was 47.05% (n = 48), parity 3 was 10.78% (n = 11), and grand multiparity was 3.92% (n = 4).

Of the research individuals, 22.54% (n = 23) had an acute problem lasting less than six months, whereas 77.45% (n = 79) had a chronic complaint lasting more than six months. 5.88% (n=6) of the individuals had hyperthyroidism, 26.47% (n=27) had hypothyroidism, 34.31% (n=35) had subclinical hypothyroidism, and 33.33% (n=34) had euthyroidism. According to Table 2, the bleeding patterns in 11.76% (n=12), 20.58% (n=21), 32.35% (n=33), and 35.29% (n=36) of the research individuals were PMB, IMB, HPMB, and HMB.

37.25% (n=38) of the participants showed no anaemia, 33.33% (n=34) showed mild anaemia, 20.58% (n=21) showed moderate anaemia, and 8.82% (n=9) showed severe anaemia in study subjects. In 9.80% (n=10), 15.68% (n=16), 10.78% (n=11), 14.70% (n=15), 12.74% (n=13), and 19.60% (n=20) of the research individuals, pressure symptoms, dysmenorrhea, dyspareunia, discharge per vaginum, heaviness in the lower abdomen, and pain in the lower abdomen were among the other reported complaints. Table 3 shows that 4.90% (n=5) of the research respondents reported no compliance.

## DISCUSSION

The goal of the current prospective analytical investigation was to evaluate the use and effectiveness of MRI in patients with abnormal uterine bleeding (AUB). The goal of the current prospective analytical investigation was to evaluate the use and effectiveness of MRI in patients with abnormal uterine bleeding (AUB). 16.66% (n=17) of the participants were in the age range of 31–40 years, 61.76% (n=63) in the age group of 41–50 years, 10.78% (n=11) in the age group of 51–60 years, and 61–72 years.

Concerning parity, there were 26.47% (n=27) females with 0 parity, 11.76% (n=12) with parity 1, 47.05% (n=48) with parity 2, 10.78% (n=11) subjects with parity 3, and 3.92% (n=4) with grand multiparity. These demographics were comparable to what is studied by Breitkopf DM et al<sup>11</sup> in 2004 and Nair R et al<sup>12</sup> in 2015 where authors assessed the subjects with comparable demographics.

The duration complaint in study subjects were acute <6 months in 22.54% (n=23) subjects and was chronic >6 months in 77.45% (n=79) subjects. 5.88% (n=6) of the individuals had hyperthyroidism, 26.47% (n=27) had hypothyroidism, 34.31% (n=35) had subclinical hypothyroidism, and 33.33% (n=34) had euthyroidism. In 11.76% (n=12), 20.58% (n=21), 32.35% (n=33), and 35.29% (n=36) of the research patients, the bleeding pattern was PMB, IMB, HPMB, and HMB. These outcomes were in line with the findings of Munro MG et al.<sup>13</sup> in 2011 and Khan R et al.<sup>14</sup> in 2016, the authors of which reported a clinical profile comparable to that of the current investigation. 37.25% (n=38) of the study participants had no anaemia, 33.33% (n=34) had mild anaemia, 20.58% (n=21) had moderate anaemia, and 8.82% (n=9) had severe anaemia.

Additional complaints included lower abdominal pain, pressure feelings, dysmenorrhea, dyspareunia, discharge per vaginum, heaviness in the lower abdomen, and 14.70% (n=15), 12.74% (n=13), and 19.60% (n=20) of the research individuals, in that order. Of the research individuals, 4.90% (n=5) did not report any complaints. These findings were consistent with those of Grimbizis GF et al.<sup>15</sup> in 2010 and Suresh M et al.<sup>16</sup> in 2017, the authors of which reported similar related complaints as those found in the current investigation.

## CONCLUSION

Although MRI is a costly imaging modality, for the subjects with no financial constraints, even with no symptoms and normal findings, MRI should be the investigation and imaging modality of choice. It also plays a vital role in staging and diagnosing cancers, which is a common cause of abnormal uterine bleeding. Within the constraints of the study, the current investigation suggests that abnormal uterine bleeding is a frequently observed finding in women in the 40–51 year old perimenopausal age range who have medical illnesses, with malignancies to myomas being the linked etiological variables.

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## TABLES

S. No	Characteristics	Percentage (%)	Number (n)
<b>1.</b>	<b>Age groups</b>		
a)	31-40	16.66	17
b)	41-50	61.76	63
c)	51-60	10.78	11
d)	61-72	10.78	11
<b>2.</b>	<b>Parity</b>		
a)	0	26.47	27
b)	1	11.76	12
c)	2	47.05	48
d)	3	10.78	11
e)	Grand multipara	3.92	4

**Table 1: Demographic characteristics of the study subjects**

S. No	Parameter	Percentage (%)	Number (n)
<b>1.</b>	<b>Complaint duration</b>		
a)	<6 months (Acute)	22.54	23
b)	>6 months (Chronic)	77.45	79
<b>2.</b>	<b>Thyroid Status</b>		
a)	Hyperthyroidism	5.88	6
b)	Hypothyroidism	26.47	27
c)	Subclinical Hypothyroid	34.31	35
d)	Euthyroid	33.33	34
<b>3.</b>	<b>Pattern of Bleeding</b>		
a)	PMB	11.76	12
b)	IMB	20.58	21
c)	HPMB	32.35	33
d)	HMB	35.29	36

**Table 2: Complaints of the study subjects with AUB**

S. No	Parameter	Percentage (%)	Number (n)
<b>1.</b>	<b>Anemia</b>		
a)	No Anaemia ( $\geq 11$ gm/dL)	37.25	38
b)	Mild Anaemia (9.5 - 11 gm/dL)	33.33	34
c)	Moderate Anaemia (8 - 9.5 gm/dL)	20.58	21
d)	Severe Anaemia (< 8 gm/dL)	8.82	9
<b>2.</b>	<b>Others</b>		
a)	Pressure Symptoms	9.80	10

<b>b)</b>	Dysmenorrhea	15.68	16
<b>c)</b>	Dyspareunia	10.78	11
<b>d)</b>	Discharge per Vaginum	14.70	15
<b>e)</b>	Heaviness in lower Abdomen	12.74	13
<b>f)</b>	Pain in lower Abdomen	19.60	20
<b>g)</b>	No Complaints	4.90	5

**Table 3: Associated complaints in the study subjects with AUB**