

Abnormal Uterine Bleeding: Comparison of Transabdominal and Transvaginal Sonography

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Abstract

Introduction: Transabdominal (TAS) and transvaginal sonography (TVS) are the preferred modalities for initial imaging evaluation of abnormal uterine bleeding (AUB). The main causes of such bleeding in perimenopausal patients are endometrial polyp, adenomyosis, leiomyoma and endometrial hyperplasia. The aim of this study was to evaluate the findings and compare TAS and TVS in perimenopausal and menopausal patients with AUB.

Method: A prospective cohort study was performed and fifty nine perimenopausal and postmenopausal patients with AUB meeting the inclusion criteria were invited to participate in this study. TAS and TVS was done, findings recorded in proforma and analyzed.

Result: Mean endometrial thickness at various uterine levels was more on TVS compared to TAS. Abnormal findings like adenomyosis and nabothian cysts were detected on TVS than TAS. On TAS 41% of patients had bulky uterus while only 2.5 % had bulky uterus on TVS. Diagnosis of intramural fibroid on TVS and TAS was comparable; however, submucosal fibroids were better visualized on TVS.

Conclusion: TVS is better to diagnose endometrial polyps, submucosal fibroids, nabothian cysts and adenomyosis while TAS is superior in cases of bulky uterus. In cases with intramural fibroids and endometrial hyperplasia, both were comparable. TAS should still be used as the initial monitoring method for gynecologic abnormalities due to its greater depth penetration and thus wider field of view and should be followed by TVS.

Keywords: Abnormal uterine bleeding, Transabdominal sonography, Transvaginal sonography.

Introduction

Menstrual disorders like menorrhagia affects up to 30% of women throughout their reproductive lifetime.¹ These complaints affect quality of life, result in time off from work, lead to surgical intervention including hysterectomy and ultimately have a significant impact on the society and the health care system.²

AUB may be acute or chronic and is defined as bleeding from the uterine corpus that is abnormal in regularity, volume, frequency, or duration and occurs in the absence of pregnancy. Post menopausal bleeding is bleeding occurring more than a year after the acknowledged

menopause while bleeding occurring before the age of 9 is called precocious menstruation.³ Amenorrhea means absence of menses, metrorrhagia is irregular bleeding which may be of reduced, normal, or excessive volume, and may occur at intervals of less than 24 days and oligomenorrhoea refers to infrequent menstrual cycles, less than 2 cycles in a 90 day interval. The term dysfunctional uterine bleeding (DUB) classically has been used to describe excessive noncyclic endometrial bleeding unrelated to anatomical lesions of the uterus or to systemic disease.⁴

The etiologies of AUB may be classified based on the PALM-COEIN system: Polyp, Adenomyosis,

Leiomyoma, Malignancy and hyperplasia, Coagulopathy, Ovulatory dysfunction, Endometrial, Iatrogenic, and Not otherwise classified.⁵

TAS or TVS may be the initial imaging modality for patients with AUB. In this study we evaluated the findings of AUB patients on TAS and TVS and compared the two modalities.

Method

This was a prospective descriptive cohort study done in the sonography unit of a tertiary hospital in Kathmandu. Ethical approval was obtained from IRB. Using the formula $n = P \times (100 - P) \times z^2/d^2$ where P is the anticipated prevalence, d is the desired precision z is the appropriate value from the normal distribution for the desired confidence. A study done in India, reported prevalence of AUB to be around 17.9%.⁶ We wished to be 95 percent sure that the estimate will lie within 10 % of the true prevalence, so sample size was: 57.

Females above 40 years, who were referred for pelvic sonography for AUB were included over a period of one year. Patients with pregnancy, intrauterine device in situ, active PID and diagnosed cases of uterine/ endometrial carcinoma were excluded. Non probability sampling was used and all perimenopausal and postmenopausal patients meeting inclusion criteria were invited to participate in this study.

Medison Accuvix A30 ultrasound machine with C1-6 2D (4MHZ) curvilinear probe for TAS and EC 4-9IS 2D (6.5MHZ) vaginal probe for TVS were used. TAS was done in supine position on full bladder and TVS done post void. Uterus was assessed for size (length x depth x width), endometrial thickness, anterior and posterior myometrial thickness, focal lesions of myometrium and cervix uteri. The endometrial thickness was evaluated in sagittal view at proximal, middle and distal uterine levels.

Uterus was evaluated for focal lesions like fibroid (intramural, submucosal or subserosal), adenomyosis, nabothian cyst. The perimenopausal uterus was diagnosed as bulky with uterine length more than 8 cm, width 5 cm and depth 3.2 cm.⁷ Thickened endometrium diagnosed in patients with endometrial thickness more than 4 mm.⁸

The collected data was edited, classified, coded and tabulated for organizing the individual piece of information. The data was entered and analyzed in the Statistical Package for Social Sciences (SPSS version

20). For comparing the uterine length, width and depth, on TAS and TVS, Pearson's correlation test was used.

Results

A total of 59 patients were included in the study, mean age of the patients was 46.9 years, minimum and maximum being 40 and 63 years respectively. [Fig.1]

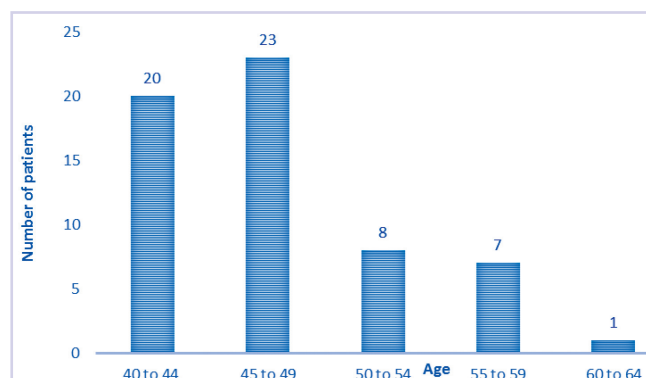


Figure 1 Bar chart showing age distribution of patients

52% of the patients with AUB presented with complain of menorrhagia while 27.1 % presented with PMB and 17.2% had oligomenorrhea. [Fig.2] Similar numbers of abnormal scans were found on both TAS and TVS with 66.1% of the AUB patients having an abnormal scan and 33.9% being normal. However, the number of findings was more on TVS scan than TAS. The findings detected were bulky uterus, endometrial hyperplasia, endometrial polyps, adenomyosis, uterine fibroids, nabothian cysts and uterine collections. [Fig 3]

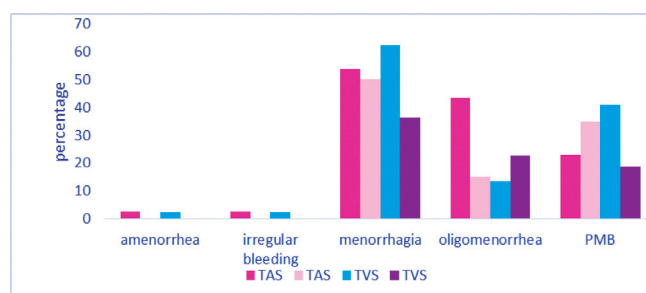


Figure 2 Correlation of the complains of patients with abnormal and normal findings on TAS and TVS

Pearson's correlation coefficient (r) was found to be 0.675 (p <0.01) for uterine length, 0.741 (p <0.01) for width and 0.845 (p <0.01) for height which suggests significant positive correlation on TAS and TVS.

The mean endometrial thickness at proximal, middle and lower uterus were compared and it was found to be slightly higher on TVS and in the group with complaint of menorrhagia, being about 8.9 mm on TAS and 9.8 mm on TVS in the middle third. [Table 1]

Table 1 Endometrial thickness in TAS and TVS

	Endometrial thickness TAS (cm) Mean/Standard Deviation			Endometrial thickness TVS (cm) Mean/standard deviation		
	Proximal	Middle	Lower	Proximal	Middle	Lower
Rest(n 20)	0.36/0.15	0.33/0.08	0.26/0.07	0.36/0.15	0.33/0.08	0.26/0.07
Menorrhagia (n 31)	0.84/1.22	0.89/1.35	0.66/1.11	0.82/1.01	0.98/1.62	0.85/1.57
Oligomenorrhea (n 10)	0.31/0.10	0.28/0.14	0.25/0.10	0.58/0.45	0.55/0.38	0.3/0.15

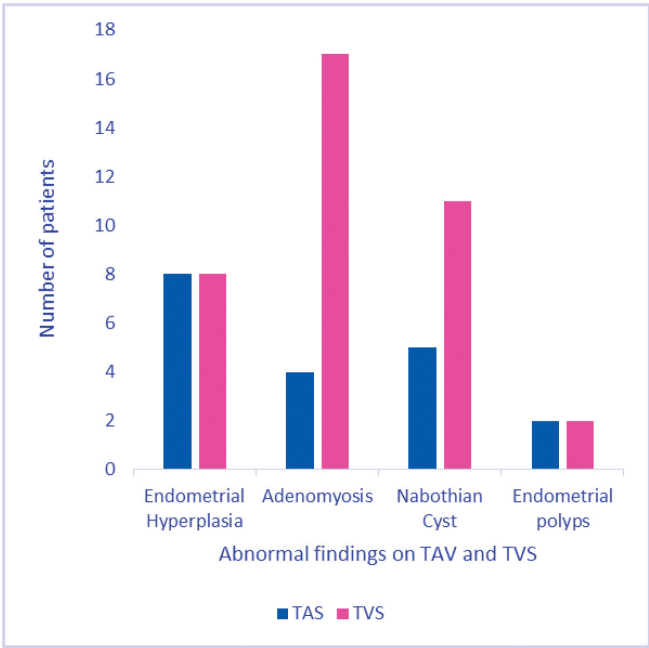


Figure 3: Comparison of various sonographic findings on TAS and TVS.

41% of the patients had bulky uterus on TAS and only 2.5 % had bulky uterus on TVS. 17 patients had fibroid seen on TAS and 18 on TVS, of which 13 were intramural, two subserosal and two submucosal fibroids. A submucosal fibroid on TVS was seen as an endometrial polyp on TAS. Out of the 13 intramural fibroids, 8 (61.5%) were seen in anterior myometrium and 5 (38.5%) in the posterior myometrium. 12 (70%) fibroids were hypoechoic, 4 (23.5%) isoechoic and only 1 (5.5 %) hyperechoic. [Fig 4 a and b]

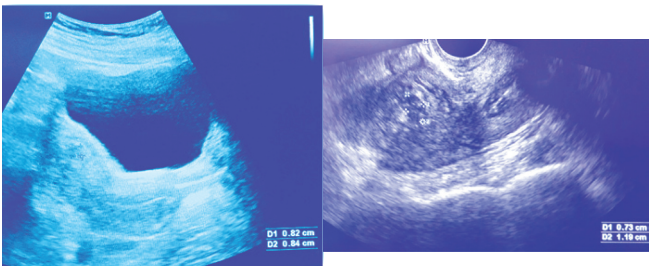


Figure 4 a and b: Small anterior wall intramural fibroid in TAS and TVS. Note the more clear delineation on TVS.

17 (28.8%) patients had adenomyosis on TVS, of which only three were diagnosed on TAS. [Fig 5] There were three endometrial polyps detected on TAS of which one was found to be a submucosal fibroid on TVS. [Fig. 6 and 7] 11 patients had nabothian cyst on TVS while only 5 of these patients shows nabothian cysts on TAS. Eight patients had endometrial hyperplasia seen in both TAS and TVS.



Figure 5 – Multiple tiny anechoic cystic areas anterior and posterior uterine wall in a patient with Adenomyosis.

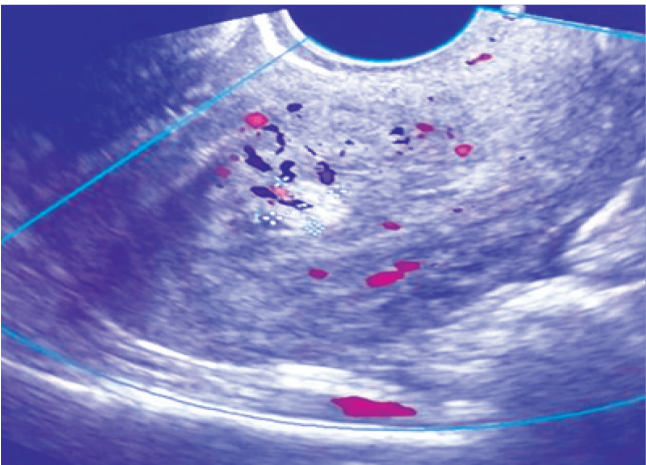


Figure 6 Hyperechoic lesion in uterine cavity suggestive of endometrial polyp.



Figure 7 TVS showing heterogeneously hypoechoic lesion in uterine cavity without any vascular pedicle, suggestive of submucosal fibroid.

Discussion

Both TAS and TVS are cheap, easily available, quick and reliable method for evaluation of uterus and adnexa. The proximity of the transducer to the uterus in TVS allows the use of higher-frequency transducers, producing much better resolution, which provides better image quality and anatomic details, however, is limited by the field of view. In our set up TAS is used more commonly than TVS is more cost effective, needs less trained manpower and is less time consuming. However, we found good patient compliance and acceptance of TVS as it eliminates the need for a full bladder, saving time and the embarrassment any incontinence. Also, artifact due to the obesity was not a problem with TVS.

A study on prevalence of different menstrual irregularities in women with AUB performed by Tabassum et al stated that 33% of AUB manifested as menorrhagia and only 11.8% had hypomenorrhea while we found about 52% cases to be menorrhagia.⁹ This is similar to our results where majority of patients with AUB presented with complain of menorrhagia, 27.1 % with PMB and 17.2% oligomenorrhea.

Of total 59 patients 20 (33.9%) had normal scan and 39 (66.1%) had abnormal findings on both TAS and TVS. There was significant positive correlation between uterine length, width and depth in TAS and TVS.

On comparing the endometrial thickness in patients with oligomenorrhea and menorrhagia, similar results were appreciated. The endometrial thickness was slightly more on TVS which is similar to the study by Tsuda H et al. where the mean endometrial thickness estimated by TVS was higher than that obtained by TAS.¹⁰

Slightly more number of fibroids were diagnosed on TAS than TVS in our study. One lesion appearing as a polyp on TAS later confirmed as submucosal fibroid on TVS. Our study is consistent with that by Dipi et al. which concluded TVS to be slightly more sensitive, specific and accurate for diagnosing leiomyoma than TAS for uterine masses.¹¹ Majority (64 %) of fibroids appeared hypoechoic on both TAS and TVS, 29% were isoechoic followed by 5.8% hyperechoic to surrounding myometrium which is similar to findings of Tamura-sadamori et al.¹²

6% of AUB patients had an unexpected finding of an intrauterine collection which was evident in the 46-50 age groups mostly. The most probable cause of this observation was due to stasis of blood clots for a long duration of time. Only 3 patients had adenomyosis on both TAS and TVS. However, 14 patients on TVS seen as adenomyosis were not diagnosed on TAS. All 14 patients who had adenomyosis were in the age group of 42- 50 years in our study which is similar to multiple other studies which have adenomyosis is common in parous women around the age of 40. Most often adenomyosis is seen on TVS as bulky uterus with heterogenous myometrium.¹³ There were five nabothian cysts seen on TAS and 11 on TVS, implying a more conspicuous visualization on TVS.

A study by Kavitha Kothapally et al. concluded that TVS was superior to TAS in most cases of pelvic pathology. In cases of ovarian follicle monitoring, suspected polycystic ovaries, endometrial pathology and suspected ectopic pregnancy, TVS may be used as the initial sonographic technique and can even replace TAS.¹⁴

The limitation of our study was the sample size. Our study was not large enough to detect significant differences between TAS and TVS in AUB patients. In patients with a thick endometrium, saline infusion sonohysterography (SIS) can determine whether the endometrium is diffusely thick, has focal areas of thickening or luminal lesion. We recommend further studies to compare diagnostic accuracy of TVS and SIS for AUB patients with larger sample size.

Conclusion

A meticulous sonographic evaluation of uterine cavity is needed in patients with various gynecologic disorders including AUB. Our study showed that number of abnormal findings were more on TVS compared to TAS

particularly with adenomyosis. However, TAS was superior to TVS in cases of bulky uterus. Disadvantage of TVS was its limited field of view.

We conclude that TVS is better and more accurate than TAS in evaluation of AUB, allowing more conspicuous visualization of the focal lesions. However, TAS should still be used for initial survey to rule out the possibility of overlooking a mass lying outside the field of view of the TVS transducer.

Conflict of Interest: None Declare

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