



TO STUDY THE EFFICACY OF SONOHYSTEROGRAPHY IN THE EVALUATION OF ABNORMAL UTERINE BLEEDING.

KEYWORDS

Abnormal Uterine Bleeding, Histopathology, Hysteroscopy, Sonohysterography

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ABSTRACT *Background & objectives:* Abnormal uterine bleeding is commonly encountered gynaecological complaint and an important source of morbidity. This study addresses the accuracy of sonohysterography as baseline investigative modality in evaluation of abnormal uterine bleeding and to assess the necessity and type of further investigation or intervention. the accuracy of sonohysterography in the diagnosis of intracavitary uterine lesions is compared to that of hysteroscopy
Methods: 25 patients presenting with AUB, were subjected to sonohysterography as an out patient procedure followed by hysteroscopy after admission into hospital. The findings of sonohysterography and hysteroscopy were compared with histopathological findings of tissues obtained from hysteroscopy/hysterectomy/ dilatation and curettage. Efficacy of sonohysterography has been compared to that of hysteroscopy in diagnosing intracavitary lesions in patients presenting with abnormal uterine bleeding.
Conclusion: This study concludes that with it's high sensitivity and high negative predictive value, sonohysterography can be used as an initial screening procedure in the evaluation of AUB and to determine the best surgical technique of treating the anatomical cause.

INTRODUCTION

Abnormal uterine bleeding is a commonly encountered gynaecological problem accounting for 15% of office visits & almost 25% of gynaecological operations¹. It occurs in women of all ages. Abnormal uterine bleeding is an overarching term used to describe any departure from normal menstruation or from a normal menstrual cycle pattern and covers the full range of symptoms.²The evaluation of abnormal uterine bleeding is age specific. The traditional blind endometrial curettage, hysteroscopy, transvaginal ultrasonography & sonohysterography are the investigative modalities currently available in the evaluation of abnormal uterine bleeding in the reproductive, peri and post menopausal age groups.

Hysteroscopy allows direct visualization of endometrial cavity and endocervix with an added advantage of guided biopsies.

SALINE SONOHYSTEROGRAPHY entails the distension of the endometrial cavity with saline during standard transvaginal ultrasound, delineating focal endometrial lesions and visualizing abnormalities of the uterine cavity³. It is an out patient procedure, comfortable to the patient & less expensive. Sonohysterography is a less invasive procedure than a surgical technique such as hysteroscopy and it should be the procedure of choice for imaging endometrial cavity in patients with abnormal uterine bleeding⁴.

In developing countries like India, where the luxury of hysteroscopy is not accessible to most of the patients, a simpler, cost effective, safer, investigation like sonohysterography can be very useful in giving proper direction for the evaluation of the common problem – Abnormal uterine bleeding.

AIMS AND OBJECTIVES:

To study the efficacy of Sonohysterography in the evaluation of abnormal uterine bleeding.

The accuracy of Sonohysterography in the diagnosis of intracavitary uterine lesions is compared to that of Hysteroscopy.

The findings of Sonohysterography and Hysteroscopy are correlated with histological findings of tissues obtained from Operative Hysteroscopy/Hysterectomy/Dilatation and Curettage.

To assess Sonohysterography as a primary investigative modality for abnormal uterine bleeding.

MATERIALS AND METHODS:

Patient selection: 25 married women, presenting with abnormal uterine bleeding were enrolled after excluding pregnancy and nongynaecological causes. Unmarried women and women with puberty menorrhagia were excluded from the study. All the patients were explained about the procedures and informed written consent was obtained.

A detailed history was obtained followed by general and pelvic examination. Papsmear was taken at the time of presentation or later in those patients with bleeding per vaginum.

Lab investigations- Haemoglobin, Bleeding time, Clotting time, platelet count and Thyroid profile were done. Prothrombin time, Partial thromboplastin time, Renal parameters, Urine for pregnancy test, Liver function tests were done as and when required.

The findings of sonohysterography and hysteroscopy were compared with histopathological findings of tissues obtained from operative hysteroscopy / hysterectomy / dilatation and curettage.

OBSERVATIONS & ANALYSIS

25 married women, presenting with abnormal uterine bleeding were enrolled for the study. In this study the patients age group was between 21 and 56 years.

AGE (in years)	No. OF PATIENTS	% OF PATIENTS
20 - 29	4	16 %
30 - 39	7	28 %
40 - 49	12	48 %
50 and above	2	8 %

Patients mainly were of age group 40 - 49 yrs. comprising 48% of study population.

2. Distribution of patients according to the parity is shown below.

PARITY	No. OF PATIENTS	% OF PATIENTS
Primi	5	20 %
Multi	20	80 %

3. In our study 3 patients accounting for 12% complained of dysmenorrhoea in addition to bleeding abnormalities.

DYSMENORRHOEA	No. OF PATIENTS	% OF PATIENTS
Present	3	12 %
Absent	22	88%

4. Bleeding patterns of the patients on presentation is as follows

BLEEDING PATTERNS	No. OF PATIENTS	% OF PATIENTS
Menorrhagia	9	36 %
Polymenorrhagia	6	24 %
Metrorrhagia	2	8 %
Post partum bleeding	1	4 %
Post abortal bleeding	2	8 %
Oligomenorrhagia	3	12 %
Post menopausal bleeding	2	8 %

The most common bleeding pattern at presentation was menorrhagia which accounted for 36%. The 2 patients who presented with post menopausal bleeding are known cases of Carcinoma Breast and were on tamoxifen therapy.

5. 16 women accounting for 64% were anaemic at the time of presentation. Haemoglobin less than 11gm% was considered as anaemia in our study.

ANAEMIA	No. OF PATIENTS	% OF PATIENTS
Present	16	64 %
Absent	9	36 %

COMPARATIVE ANALYSIS OF SONOHYSTEROGRAPHY VERSUS HYSTEROSCOPY IN DIAGNOSING INTRACAVITARY UTERINE LESIONS.

(As hysteroscopy aids in direct visualization of uterine cavity, assuming it as gold standard, the efficacy of sonohysterography for diagnosing intracavitary lesions was evaluated)

	Hysteroscopy	Sonohysterography	Accuracy in %
1 NORMAL	7	5	71%
2 ABNORMAL	17	19	*
Endometrial Hyperplasia	3	5	*
Focal	2	4	
Diffuse	1	1	
Submucous leiomyoma	6	6	100%
Endometrial Polyp	5	5	100%
Atrophic Endometrium	1	1	100%
Retained products of conception	2	2	100%
Endometrial carcinoma	0	0	0
3 PROCEDURE FAILURE	0	1	*

(No intracavitary uterine pathology is considered normal.)

The efficacy of sonohysterography was same as hysteroscopy in diagnosing intracavitary uterine lesions – submucous leiomyoma, endometrial polyps, atrophic endometrium and retained products of conception.

The efficacy of sonohysterography in diagnosing normal endometrial cavity is only 71% when compared to hysteroscopy.

Two cases of focal endometrial hyperplasia on sonohysterography were diagnosed as normal intrauterine cavities on hysteroscopy.

Of 25 patients who enrolled for the study, sonohysterography could not be done on 1 patient because she had vasovagal syncope after insertion of intrauterine catheter. Hence data from only 24 patients is analysed for positive and negative predictive values of sonohysterography in comparison with hysteroscopy for diagnosing intracavitary uterine lesions. (Assuming hysteroscopy as standard)

		Hysteroscopy Findings	
		Disease present	Disease absent
Sonohysterography Findings	Positive findings	17	2
	Negative findings (normal)	0	05

POSITIVE PREDICTIVE VALUE OF SONOHYSTEROGRAPHY = $17/17+2 = 17/19=89.47\%$

NEGATIVE PREDICTIVE VALUE OF SONOHYSTEROGRAPHY = $5/5+0 = 5/5 = 100\%$

COMPARATIVE ANALYSIS OF SONOHYSTEROGRAPHY VERSUS HISTOPATHOLOGY (Histopathological findings of tissues obtained by operative hysteroscopy/ hysterectomy/ dilatation and curettage is the gold standard.)

	Histopathology	Sonohysterography	Accuracy in %
1 NORMAL	7	5	71%
2 ABNORMAL	17	19	*
Endometrial Hyperplasia	4	5	*
Submucous leiomyoma	6	6	100%
Endometrial Polyp	4	5	*
Atrophic endometrium	1	1	100%
Retained products of conception	2	2	100%
Endometrial carcinoma	0	0	
3 PROCEDURE FAILURE	0	1	*

(Proliferative and secretory endometrium are considered normal in this study)

The efficacy of sonohysterography in diagnosing normal endometrial cavity is only 71% when compared to histopathological findings.

One case of cystoglandular hyperplasia gave an impression of endometrial polyp on sonohysterography.

Two cases of focal endometrial hyperplasia on sonohysterography were diagnosed as normal endometrium on histology.

Of 25 patients who enrolled for the study, 1 patient did not complete sonohysterography because she had vasovagal syncope after insertion of intrauterine catheter. Hence data from only 24 patients who completed the study is analysed for sensitivity, specificity, positive and negative predictive values of sonohysterography in comparison with histopathological findings of tissues obtained by operative hysteroscopy/ hysterectomy/ dilatation and curettage.

		Histopathology Findings	
		Disease present	Disease absent
sonohysterography Findings	Positive findings	17	2
	Negative findings (normal)	0	05

SENSITIVITY OF SONOHYSTEROGRAPHY
 $= 17/17+0 = 17/17=100\%$

SPECIFICITY OF SONOHYSTEROGRAPHY
 $= 5/5+2 = 5/7 =71\%$

POSITIVE PREDICTIVE VALUE OF SONOHYSTEROGRAPHY
 $= 17/17+2 = 17/19=89.47\%$

NEGATIVE PREDICTIVE VALUE OF SONOHYSTEROGRAPHY
 $= 5/5+0 = 5/5 =100\%$

COMPARATIVE ANALYSIS OF HYSTEROSCOPY VERSUS HISTOPATHOLOGY (Histopathological findings of tissues obtained by operative hysteroscopy/hysterectomy/dilatation and curettage is the gold standard)

		Histopathology	Hysteroscopy	Accuracy in %
1	NORMAL	7	7	100%
2	ABNORMAL	18	18	100%
	Endometrial Hyperplasia	5	4	80%
	Submucous leiomyoma	6	6	100%
	Endometrial Polyp	4	5	*
	Atrophic Endometrium	1	1	100%
	Retained products of conception	2	2	100%
	Endometrial carcinoma	0	0	0
3	PROCEDURE FAILURE	0	0	0

(proliferative and secretory endometrium are considered normal in this study)

All 25 patients successfully completed the procedures.

The efficacy of hysteroscopy was 100% in diagnosing normal endometrium in comparison with histological findings

One case of cystoglandular hyperplasia presented as endometrial polyp on Hysteroscopy.

Data from 25 patients who completed the study is analysed for sensitivity, specificity, positive and negative predictive values of hysteroscopy in comparison with histopathological findings of tissues obtained by operative hysteroscopy/ hysterectomy/ dilatation and curettage.

		Histopathology Findings	
		Disease present	Disease absent
Hysteroscopy Findings	Positive findings	17	1
	Negative findings (normal)	1	06

SENSITIVITY OF HYSTEROSCOPY
 $= 17/17+1 = 17/18 =94.4\%$

SPECIFICITY OF HYSTEROSCOPY
 $= 6/6+1 = 6/7 =86\%$

POSITIVE PREDICTIVE VALUE OF HYSTEROSCOPY
 $= 17/17+1 = 17/18=94.4\%$

NEGATIVE PREDICTIVE VALUE OF HYSTEROSCOPY
 $= 6/6+1 = 6/7 =86\%$

Submucous leiomyoma was found to be **most common intra cavity** lesion in patients presenting with abnormal uterine bleeding.

Sonohysterography could not be proceeded on one patient as the patient had vasovagal syncope after insertion of catheter

through the cervix. All the 25 patients completed hysteroscopic procedure with no complications.

All the patients were sent home after undergoing sonohysterography except for one patient who had post procedure pain. She was treated Inj. Hyosine butyl bromide & was sent home after 2 hrs. With hysteroscopy the mean duration of hospital stay was 10 hours.

Sonohysterography was done as an out patient procedure without anaesthesia. While undergoing hysteroscopy 4 patients (16%) were given paracervical block with 2% xylocaine. The rest 21 patients (64%) underwent hysteroscopy under intravenous general anaesthesia - Ketamine.

Sonohysterography also diagnosed one adenexal lesion (Endometriotic cyst) and uterine myometrial lesions of intramural leiomyomas in 2 (8%) and adenomyosis in 1(4%) patient.

16 (64%) patients underwent hysterectomy which included all the patients with submucous leiomyoma and polyps. Operative Hysteroscopy (polypectomy/guided biopsy) was done in 3 (12%) patients. In 9 patients (36%), findings of sonohysterography and diagnostic hysteroscopy were compared with histological findings of the tissues obtained by dilatation and curettage.

After a critical evaluation it was found that,

- Histologically normal cases (proliferative or secretory endometrium) are comparable better with hysteroscopy than with sonohysterography. Sonohysterography gives false positive findings for focal endometrial hyperplasia.
- In detecting intracavitary uterine lesions both the procedures, sonohysterography and hysteroscopy have the same accuracy.
- **Whenever Sonohysterography indicated a normal intrauterine cavity, cavity was confirmed normal by hysteroscopy and or with hysterectomy specimen cut section.**

RESULTS

Of the 25 patients who enrolled for the study 1 patient did not complete the sonohysterography because the patient had vaso vagal syncope after insertion of catheter into the cervix.

There was **100%** agreement between sonohysterography and diagnostic hysteroscopy in the **diagnosis of intra cavity uterine lesions.**

Positive and negative predictive values of sonohysterography are 89.47% and 100% respectively when compared to diagnostic hysteroscopy in diagnosing intracavitary lesions.

SONOHYSTEROGRAPHY AS A DIAGNOSTIC PROCEDURE IN EVALUATION OF ABNORMAL UTERINE BLEEDING

In our study, considering histopathological findings of tissue biopsies obtained by operative hysteroscopy/ hysterectomy/ dilatation and curettage as the gold standard.

Sensitivity and specificity of sonohysterography was found to be 100% and 71% respectively.

The positive and negative predictive values were 89.4% and 100% respectively.

HYSTEROSCOPY AS A DIAGNOSTIC PROCEDURE IN EVALUATION OF ABNORMAL UTERINE BLEEDING

In our study, considering histopathological findings of tissue biopsies obtained by operative hysteroscopy/ hysterectomy/ dilatation and curettage as the gold standard.

Hysteroscopy was found to be having 94.4% Sensitivity, 86% specificity, 94.4% positive predictive value and 86% negative predictive value in the evaluation of abnormal uterine bleeding.

DISCUSSION

Abnormal uterine bleeding constitutes a major gynaecological problem. Its evaluation is important for effective management. In our study, evaluation by sonohysterography and hysteroscopy is analysed and has the following results.

In our study, sonohysterography gave abnormal anatomical findings which were not confirmed by direct visualization. It is consistent with false positive findings of sonohysterography in the studies by Lindheim SR et al and Williams CD et al.

In our study both the procedures sonohysterography and hysteroscopy are found to have similar accuracy in detecting intracavitary uterine lesions. Similar results are shown by Kramp E, Bourne T et al.

In our study whenever sonohysterography indicated a normal uterine cavity, cavity was confirmed normal by hysteroscopy and or with hysterectomy specimen cut section, which is also shown by William CD, Marshurm PB.

Sensitivity and specificity of **sonohysterography** was found to be 100% and 71% respectively in comparison with histopathological findings of tissue biopsies obtained by operative hysteroscopy/hysterectomy/dilatation and curettage.

In our study Sensitivity and specificity of **hysteroscopy** was found to be 94.4% and 86% respectively in comparison with histopathological findings of tissue biopsies obtained by operative hysteroscopy/hysterectomy/dilatation and curettage.

Sonohysterography has a high sensitivity and negative predictive value in the evaluation of abnormal uterine bleeding in relation to histopathology. It has a good negative predictive value in picking up intracavitary lesions. This makes it a good baseline investigative modality to assess the necessity and type of further investigation or intervention. Moreover evaluation with sonohysterography may help in deciding the treatment modality such as dilatation and curettage for diffuse endometrial hyperplasia, hysteroscopic guided biopsy for focal hyperplasia or hysteroscopic resection of a submucous leiomyoma extending into endometrial cavity.

In our study of 25 patients, 2 patients with abnormal endometrium at sonohysterography were found to be normal by direct visualization and by histopathology. This could be due to endometrial fragments giving a false positive picture of anatomic abnormality. In such instances, patients may undergo unnecessary surgical procedures due to false abnormal findings of sonohysterography. But since the study population is small, this needs to be further followed up on a large scale study to establish it and if proved, the precautions necessary to avoid them are to be studied.

CONCLUSION

Sonohysterography is a cost effective, easily available, less invasive procedure not requiring anaesthesia.

On the strength of evidence pertaining to sonohysterography, the procedure should be considered in the evaluation of abnormal uterine bleeding after routine transvaginal ultrasonogram.

With its high sensitivity and high negative predictive value, sonohysterography can be an initial screening procedure in the evaluation of abnormal uterine bleeding. With a normal sonohysterography, further diagnostic evaluation by invasive hysteroscopy can be avoided as the latter is associated with significant financial costs and limited availability.

The findings of sonohysterography can be used to determine the next step in the evaluation of abnormal uterine bleeding. Sonohysterography can be used as an investigation to determine the best surgical technique of treating the anatomical cause of uterine bleeding.

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