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Research Article

“SALINE INFUSION SONOHYSTEROGRAPHY VERSUS HYSTEROSCOPY IN EVALUATION OF UTERINE CAVITY FOR PATIENTS OF A.U.B (ABNORMAL UTERINE BLEEDING)”

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ABSTRACT

We studied a population of 50 patients attending the outpatient department of Calcutta National Medical College & Hospital from June 2015 to May 2016. These patients were suffering from abnormal uterine bleeding with undiagnosed causes. We tried to evaluate these patients for the presence of any endometrial pathology. Our main tools for diagnosing uterine cavity anomalies were Saline Infusion Sonohysterography (SIS) and diagnostic Hysteroscopy. Diagnostic hysteroscopy was set as the gold standard investigation and a prospective comparative study was undertaken to compare the findings of SIS with that of hysteroscopy.

Saline infusion sonohysterography was able to detect 76% of these patients to be suffering from endometrial pathology, findings of which were mostly corroborative with hysteroscopy. Polyps and fibroids were equally prevalent in lower age group whilst endometrial hyperplasia dominated the higher age group. Overall endometrial hyperplasia dominated as the most common cause of abnormal uterine bleeding. Regarding menstrual pattern, menorrhagia was seen mostly in women with submucous fibroids whilst other kinds of bleeding like intermenstrual bleeding, amenorrhea, spotting etc was seen mostly in women with endometrial hyperplasia. Menorrhagia dominated in women with normal hysteroscopic findings. Submucosal fibroids were seen mostly in non obese population whilst endometrial hyperplasia was far commoner in the obese population. Endometrial hyperplasia was also more commonly observed in women with history of intake of hormones. Polyps were seen to be presenting with less severe A.U.B. compared to submucous fibroids and endometrial hyperplasia as suggested by their hemoglobin estimation.

Saline infusion sonohysterographic findings were almost statistically significant but the kappa values suggest that their associations with hysteroscopic findings were mostly by chance. It has a high sensitivity and specificity in detection of polyps, submucous fibroids and endometrial hyperplasia with a comparable positive as well as negative predictive value. The rates of detection of polyps, submucous fibroids and endometrial hyperplasia were also quite high. So, saline infusion sonohysterography definitely shows promise in diagnosing uterine cavity anomalies and results can be statistically significant if applied to a larger sample size.

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INTRODUCTION

AUB or Abnormal Uterine Bleeding is a common but complicated clinical presentation, diagnosis of which is often difficult as the cause may be variable from simple Dysfunctional Uterine Bleeding to endometrial carcinoma. AUB is said to occur in 9-14% women between menarche and menopause^[1]. The prevalence varies in each country. In India the reported prevalence of AUB is around 17.9%^[2]. Saline infusion sonohysterography refers to a procedure in which fluid is instilled into the uterine cavity transcervically to provide enhanced endometrial visualization during transvaginal

ultrasound examination. The technique improves sonographic detection of endometrial pathology, such as polyps, hyperplasia, cancer, leiomyomas, and adhesions. In addition, it can help avoid invasive diagnostic procedures in some patients as well as optimize the preoperative triage process for those women who require therapeutic intervention. It is easily and rapidly performed at minimal cost, well-tolerated by patients, and is virtually devoid of complications. The American College of Obstetricians and Gynecologists, in conjunction with the American College of Radiology and the American Institute of Ultrasound in Medicine, developed a technology assessment document for saline infusion sonohysterography. Transvaginal

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ultrasound is used increasingly as an initial triage for patients with abnormal uterine bleeding. Sonohysterography is a subset of transvaginal sonography that is used when it is difficult to visualize the endometrium or the endometrium is thickened. Sonohysterography is particularly useful for finding focal endometrial abnormalities or confirming that a focal abnormality diagnosed by transabdominal or transvaginal ultrasound is present and better defining the nature of the abnormality

Hysteroscopy is the inspection of the uterus by endoscope with access through the cervix. It allows for the diagnosis of intrauterine pathology and serves as a method for surgical intervention (operative hysteroscopy). Hysteroscopy is useful in a number of uterine conditions. Asher man's syndrome (i.e. intrauterine adhesions); Hysteroscopic adhesiolysis is the technique of lysing adhesions in the uterus using either microscissors (recommended) or thermal energy modalities. Hysteroscopy can be used in conjunction with laparoscopy or other methods to reduce the risk of perforation during the procedure.

- Endometrial polyp-polypectomy.
- Gynecologic bleeding
- Endometrial ablation.
- Myomectomy for uterine fibroids.
- Evaluation of Congenital malformations.
- Evacuation of retained products of conception in selected cases.
- Removal of embedded IUD.

Hysteroscopy has the benefit of allowing direct visualization of the uterus, thereby avoiding or reducing iatrogenic trauma to delicate reproductive tissue which may result in Asher man's syndrome.

Saline Infusion Sonohysterography versus Hysteroscopy:

Saline infusion sonohysterography is a procedure requiring minimum aids. Although unlike hysteroscopy, it lacks therapeutic advantages, but its use as a diagnostic aid to evaluate uterine pathology cannot be ignored. Whereas hysteroscopy is still considered a costly investigation owing to its requirement of a hysteroscope and anesthetic procedures, SIS is more cost effective and with lesser complications. There is definitely a high false positive rate for SIS owing to blood clots and debris in uterine cavity which may mimic polyp but a simple Doppler can overcome such fallacies. Considering hysteroscopy as a gold standard as it provides direct visualization of uterine cavity and keeping aside its therapeutic advantages, the sensitivity, specificity, positive predictive value and negative predictive value of SIS is definitely comparable. The most frequent procedures performed on women with abnormal uterine bleeding are 2D and 3D Ultrasound. The most common accepted approach for the evaluation of abnormal uterine bleeding is 2D TVS followed by diagnostic / therapeutic hysteroscopy. The purpose of this study is to assess whether saline infusion sonohysterography could replace diagnostic hysteroscopy for the diagnosis of endometrial pathology in patients with abnormal uterine bleeding. We wish to compare the diagnostic accuracy of SIS with those of hysteroscopy beside finding demographic pattern in patients of undiagnosed A.U.B. Demographic patterns studied were age,

body weight, menstrual history, obstetric history, history of hormone replacement, significant investigation and relevant clinical features. SIS and hysteroscopic findings of endometrial polyps, submucous myomas, endometrial hyperplasia etc.were recorded independently and compared subsequently.

Review of Literature

Abnormal uterine bleeding (AUB) is one of the most common reasons for women seeking gynecological advice.¹⁻⁵ Other than dysfunctional uterine bleeding (DUB), intrauterine abnormalities are the leading cause of AUB. More than 40% of affected women with AUB are reported to have intrauterine abnormalities.⁶ The most common anatomical causes of AUB in women are submucosal fibroids, endometrial polyps, and endometrial hyperplasia.⁴ As 10% to 15% of postmenopausal vaginal bleeding is due to endometrial cancer, a thorough investigation should be carried out to evaluate these symptoms.⁷ The most frequent procedure performed on women with abnormal uterine bleeding is 2D and 3D ultrasound.^{1-5,7} For many years the most common accepted approach for the management of abnormal uterine bleeding has been the 2D TV scan followed by therapeutic hysteroscopy combined with a histological examination of the obtained specimen.⁸

Transvaginal sonography (TVS) is used as an initial investigation because it is easy, rapid and cost effective, but it is unable to differentiate intrauterine pathology with complete certainty.⁵ The gold standard for diagnosis of intrauterine abnormalities is diagnostic hysteroscopy combined with a histological examination of endometrial aspiration or biopsy.^{1,5,6,9-12} Hysteroscopy is invasive, reasonably expensive, time consuming, and involves general anesthesia.⁹⁻¹¹ Hysteroscopy is also associated with risks like uterine perforation and ascending genitourinary infection.^{10,13}

Three-dimensional saline infusion sonography (3D SIS) in comparison to hysteroscopy is less invasive, cheaper, and does not require general anesthesia.^{9,10} 3D SIS reliably evaluates uterine contour, adhesions, and focal pathologies.⁸ Furthermore, in 3D SIS, after distending the cavity with saline, there is clear visualization of the inner surface of both sides of the endometrium.^{8,13} Focal and diffuse abnormalities can be distinguished, and in most cases an endometrial polyp can be differentiated from the submucous fibroid based on the imaging characteristics.^{8,9} The polyps are typically round in shape, smooth in outline, and are generally echogenic, compared to the endometrium or are isoechoic to it. The underlying endometrial-myometrial interface is preserved.^{2,8} The presence of a vascular pedicle has a positive predictive value of up to 81.3%.⁸ Fibroids are more inhomogeneous, hypoechoic, and there is a loss of endometrial-myometrial interface. The percentage of the intracavitary portions of the submucous fibroids can be assessed by 3D SIS. In addition, the submucous fibroids can be differentiated from the intramural fibroids that are distorting the cavity. Thus by distending the inner walls of the endometrium, focal and diffuse lesions can be identified, along with the location and size of the pathology, with reasonable accuracy.^{2,8,10,13}

Aims and Objectives

Aims

To find out diagnostic efficacy of Saline Infusion Sonohysterography in cases of abnormal uterine bleeding for diagnosing endometrial pathologies.

General Objective

To compare diagnostic accuracy of SIS with that of hysteroscopy in diagnosing uterine pathology for patients of abnormal uterine bleeding.

Specific Objective

To find out the rate of detection of the following by SIS

- Polyp
- Submucous fibroids
- Endometrial hyperplasia

MATERIALS AND METHODS

Study Location

Department of Obstetrics and Gynecology and Department of Radiology of Calcutta National Medical College and Hospital.

Study Population

Women admitted in OBGYN dept. and the patients attending Outpatient Department in Obstetrics and Gynecology department with Abnormal Uterine Bleeding examined clinically and selected for SIS and Diagnostic Hysteroscopy

Study Period

One year (June 2015-May 2016)

Sample Size

50 (fifty) cases.

Inclusion Criteria

A.U.B. diagnosed in GOPD clinically and by commonly available diagnostic and ancillary aids

Exclusion Criteria

1. Pregnancy
2. Virgin women
3. Pelvic inflammatory disease
4. Morbid medical illness
5. Any diagnosed cause of menstrual abnormality by clinical or diagnostic aids.
6. Patients whose uterine cavity could not be distended by saline infusion or SIS could not be performed due to other causes.

Study Design

Prospective comparative study for assessing the demographic pattern of undiagnosed Abnormal Uterine Bleeding and the efficacy of Saline Infusion Hysterography in such cases for diagnosing abnormalities of uterine cavity as compared to hysteroscopy.

Parameters to Be Studied

1. Endometrial thickness, uterine cavity contour, polyps and synechia seen by SIS

2. Hysteroscopic findings of uterine cavity including polyps, endometrium, etc.

Study Tools

1. Saline infusion sonohysterography (TVS probe, standard HD7 Philips USG machine, SIS cannula, vaginal speculum and other minor aids)
2. Hysteroscopy (standard tools).

Analysis of Data

The data collected was tabulated, compared and analyzed by standard statistical methods in consultation with statistician, department of community medicine..

RESULTS AND ANALYSIS

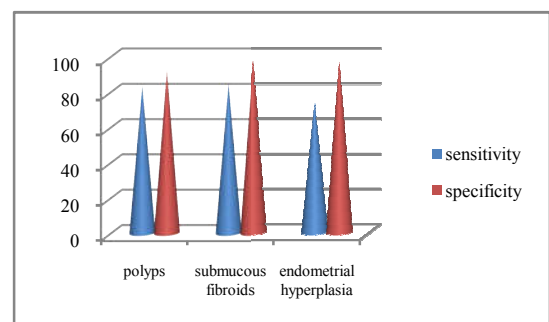
Saline Infusion Sonohysterography Vs Hysteroscopy

Sis & hysteroscopy cross tabulation						
		Count				Total (TS)
		Hysteroscopy				
		A	B	C	D	
SIS	A	10	0	0	3	13
	B	0	11	1	0	12
	C	0	1	11	1	13
	D	2	1	3	6	12
Total (TH)		12	13	15	10	50

Polyps				
Sis(a)	Hyst (a)		Total	
	Yes	No		
YES	10	3	13	
NO	2	35	37	
TOTAL	12	38	50	
sensitivity	specificity	Positive predictive value	Negative predictive value	Percentage agreement
83.3	92.1	76.9	94.6	90

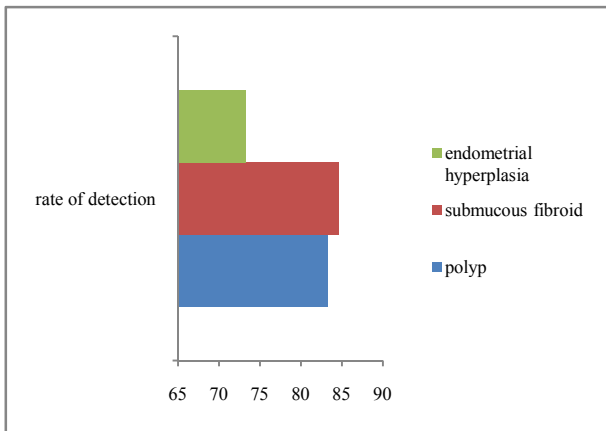
Submucous Fibroids				
Sis(b)	Hyst (b)		Total	
	Yes	No		
YES	11	1	12	
NO	2	36	38	
TOTAL	13	37	50	
sensitivity	specificity	Positive predictive value	Negative predictive value	Percentage agreement
84.6	97.3	91.2	94.7	94

Endometrial Hyperplasia				
Sis(c)	Hyst (c)		Total	
	Yes	No		
YES	11	1	12	
NO	4	34	38	
TOTAL	15	35	50	
sensitivity	specificity	Positive predictive value	Negative predictive value	Percentage agreement
73.33	97.14	91.7	89.7	90



Rate of Detection

Pathology	Rate of detection
polyps	83.3%
Submucous fibroids	84.6%
Endometrial hyperplasia	73.3%



Significance

SIS			
	Observed N	Expected N	Residual
A	13	12.5	.5
B	12	12.5	-.5
C	13	12.5	.5
D	12	12.5	-.5
Total	50		

Hysteroscopy			
	Observed N	Expected N	Residual
A	12	12.5	-.5
B	13	12.5	.5
C	16	12.5	3.5
D	9	12.5	-3.5
Total	50		

Test Statistics		
	SONOHYS	HYSTERO
Chi-Square	.080 ^a	2.000 ^a
df	3	3
Asymp. Sig.	.994	.572

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 12.5.

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	75.488 ^a	9	.000

Symmetric Measures				
	Value	Asymp. Std. Error ^a	Approx. T ^b	Approx. Sig.
Measure of Agreement				
Kappa	.680	.080	8.337	.000
N of Valid Cases	50			

a. Not assuming the null hypothesis.

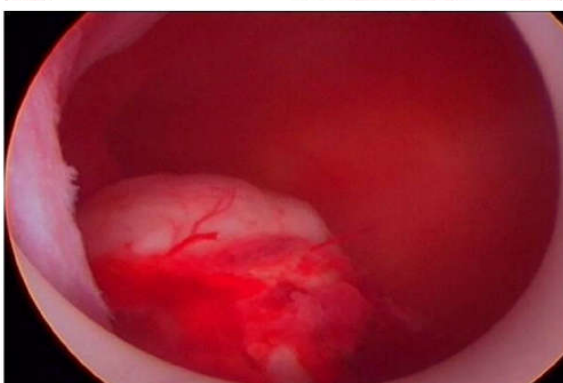
b. Using the asymptotic standard error assuming the null hypothesis.

DISCUSSION

Saline Infusion Sonohysterography was able to detect 78% of patients with undiagnosed abnormal uterine bleeding to be suffering from uterine pathologies (38 out of 50). Polyps and submucous fibroids were equally prevalent in lower age group (28.57%) whilst endometrial hyperplasia dominated in the higher age group (40%). The incidence of polyps and submucous fibroids showed an increase with age as suggested

by other studies, but few distortions were noted due to unequal distribution of age groups in the study population. The frequency of polyp in the three age groups in ascending order were 28.5% (age less than 45 years), 15% (age 45-55 years) and 31% (age more than 55 years) respectively. The prevalence of submucous fibroids were ranged from 18%-30%. The prevalence of endometrial hyperplasia dominated in perimenopausal and post menopausal age group ranging from 31% to 40% as evidenced by other studies. The overall findings suggest that endometrial hyperplasia dominated as a cause of abnormal uterine bleeding amounting to 30% of study subjects compared to 24% and 26% for polyps and submucous fibroids respectively. Significant endometrial pathology was seen in women with higher parity compared to women with lower parity which may be confounded due to more participation of women with higher parity in my study.





As stated earlier, menometrorrhagia was the most common menstrual pattern noted in women with significant endometrial pathology while menorrhagia was complained by women with normal findings on hysteroscopy. Menometrorrhagia dominated mostly in submucous fibroids (10 out of 13) in polyps (6 out of 12) and endometrial hyperplasia (6 out of 15). Other kinds of abnormal bleeding mostly like intermenstrual bleeding, spotting, etc. were seen with cases of endometrial hyperplasia (6 out of 12 cases). Since non obese population dominated our study (32 out of 50) endometrial pathology was more common in them compared to obese population. Prevalence of submucosal fibroids (31.2%) was more common in the non obese age group whilst endometrial hyperplasia was far more common in the obese counterpart 38.9%. this is a definite significant finding as obesity is a known risk factor of corpus cancer syndrome. Family history was mostly negative in most women which can be partially attributed to recall bias. Endometrial hyperplasia was most commonly noted in women with history of hormone replacement (8 out of 23) while polyps and fibroids were more common in women having no such history (8 out of 27). This finding again enlightens the fact that unopposed estrogens therapy is associated with varying pathologic conditions of endometrium ranging from cystic glandular hyperplasia to invasive carcinoma. Submucous fibroids and endometrial hyperplasia dominated in women having history of uterine surgeries (28% each). On the other hand endometrial hyperplasia dominated in the group of women not having any history of uterine surgeries (32%).

Hemoglobin percentage indicating the severity of A.U.B was low in women with submucous fibroid and endometrial hyperplasia who mostly suffered from menometrorrhagia. Twelve out of 17 women with low hemoglobin% suffered with endometrial hyperplasia and submucous fibroids (6 in each group). Polyps were seen to be presenting with less severe A.U.B as 11 out of 33 women with higher hemoglobin percentage were diagnosed with polyps. Strangely, in our study 34.8% of women suffering from polyps had an abnormal uterine size compared to 26.0% of women with submucous polyps. Also in the normal uterine size group endometrial hyperplasia dominated (10 out of 27). Hence most of the findings are corroborative with previous studies although a few distortions can be attributed to smaller sample size and inhomogeneity of the study population.

Saline Infusion Sonohysterography Vs Hysteroscopy

Saline sonography performed well in our study for detecting endometrial pathology with a chi square value of 0.08. Its sensitivity in detecting polyps, submucous fibroids and endometrial hyperplasia was 83.3%, 84.6% and 73.3% respectively. Its specificity in detecting the same pathology in the same order was 92.1%, 97.3% and 97.1% respectively. Apart from these, its positive predictive value and negative predictive value were comparable to the study done by bingo et al in 2011.

CONCLUSION

Undiagnosed A.U.B. constitutes a large burden to gynecological OPD in all hospitals. The socio demographic characteristics of such undiagnosed abnormal uterine bleeding have a variable pattern. Some of these undiagnosed cases are often stamped as dysfunctional uterine bleeding without assessing endometrial pathology. After thorough investigations to rule out endometrial pathology, most of these patients present with intra- cavity anomalies like polyp and submucous fibroid, the diagnosis of which is often missed by commonly available investigative tools. Saline infusion sonohysterography is an effective method to diagnose uterine cavity abnormalities. Compared to hysteroscopy it is cost effective, involves minimal aids and has lesser inter observer variability. It has some technical difficulties like stenosed internal os which may lead to inability to pass catheter or blood clots which may mimic polyp. The sensitivity and specificity of Saline infusion Sonohysterography are comparable to hysteroscopy in evaluating uterine cavity as demonstrated by our study and corroborated by other studies. Its use as a pre operative evaluation shows promise as it may help avoid major surgical interventions and its associated morbidities. Upon accurate diagnosis of endometrial pathology by SIS, Most of these abnormalities can be managed by minor procedures, thus avoiding complications of major gynaecological interventions and leading to better management of hospital resources.

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Bibliography

1. Moschos E, Ashfaq R, McIntire DD, Liriano B, Twickler DM. Saline infusion sonography endometrial sampling compared with endometrial biopsy in diagnosing endometrial pathology. *Obstet Gynecol.* 2009;113:881–7.
2. Li Ong C. Saline infusion sonohysterography. *Ultrasound Clin.* 2007;2:121–3.
3. Susanna I. An imaging algorithm for evaluation of abnormal uterine bleeding: Does sonohysterography play a role? *Menopause.* 2007;14:823–5.
4. Farquhar C, Ekeroma A, Furness S, Arroll B. A systematic review of transvaginal ultrasonography, sonohysterography and hysteroscopy for the investigation of abnormal uterine bleeding in premenopausal women. *Acta Obstet Gynecol Scand.* 2003;82:493–504.
5. Bonnamy L, Marret H, Perrotin F, Body G, Berger C, Lansac J. Sonohysterography: A prospective survey of results and complications in 81 patients. *Eur J Obstet Gynecol Reprod Bio.* 2002;102:42–7.
6. de Kroon CD, Jansen FW. Saline infusion sonography in women with abnormal uterine bleeding: An update of recent findings. *Curr Opin Obstet Gynecol.* 2006;18:653–7.
7. Ryu J, Kim B, Lee J, Kim S, Lee S. Comparison of transvaginal ultrasonography with hysterosonography as a screening method in patients with abnormal uterine bleeding. *Korean J Radiol.* 2004;5:39–46.
8. Glanc P, Betel C, LevToaff A. Sonohysterography: Technique and clinical applications. *Ultrasound Clin.* 2008;3:427–31.
9. Alfhaily F, Ewies A. The first-line investigation of postmenopausal bleeding: Transvaginal ultrasound scanning and endometrial biopsy may be enough. *Int J Gynecol Cancer.* 2009;19:892–5.
10. Erdem M, Bilgin U, Bozkurt N, Erdem A. Comparison of transvaginal ultrasound and saline infusion sonohysterography in evaluating the endometrial cavity in pre- and postmenopausal women with abnormal uterine bleeding. *Menopause.* 2007;14:846–52.
11. De Kroon CD, De Bock GH, Dieben SW, Jansen FW. Saline contrast hysterosonography in abnormal uterine bleeding: A systematic review and meta- analysis. *Obstet Gynecol Survey.* 2004;59:265–6.
12. Hamilton JA, Larson AJ, Lower AM, Hasnain S, Grudzinskas JG. Routine use of saline hysterosonography in 500 consecutive, unselected, infertile women. *Hum Reprod.* 1998;13:2463–73.
13. Salim R, Lee C, Davies B, Jolaoso E, Ofuasia E, Jurkovic D. A comparative study of three-dimensional saline infusion sonohysterography and diagnostic hysteroscopy for the classification of submucous fibroids. *Hum Reprod.* 2005;20:253–7
