

Hysterosalpingocontrastsonography in Recurrent Miscarriage

Nirmala Kondaveeti, Jane Leavy, Keelin O'Donoghue, Bernard J Stuart, Michael J Turner.
Coombe Women's Hospital, Dublin 8, Ireland.

Objective – To determine the value of hysterosalpingocontrastsonography (HyCoSy) in recurrent miscarriage. **Method** – Prospective evaluation of the first four years of the service in a tertiary university teaching hospital. **Results** – A total of 57 women had a HyCoSy in the investigation of recurrent miscarriage. The age ranged between 20 and 44 years (mean 32.6). The number of previous miscarriages ranged between 2 and 10. Thirty three percent had abnormal findings, for example, endometrial polyps (7%), endometrial fibroids (7%), septate uterus (7%), cervical incompetence (7%), bicornuate uterus (3.5%), intrauterine adhesions (1.7%). Twenty of the 35 women followed up in our hospital have become pregnant to date. Of these, two miscarried and 18 delivered a baby weighing 500 gm or more. **Conclusion** - In women with recurrent miscarriage HyCoSy is well tolerated as an out-patient procedure and provides clinically useful information. We recommend that HyCoSy should replace hysterosalpingograms in the investigation of recurrent miscarriage where a transvaginal ultrasound service is available.

Key words : recurrent miscarriage, hysterosalpingocontrastsonography

Miscarriage is a common clinical problem in reproductive life. Recurrent pregnancy loss must be distinguished from sporadic spontaneous miscarriage. The Royal College of Obstetricians and Gynaecologists defined recurrent pregnancy loss as loss of three or more consecutive pregnancies. There is, however, increased risk of future pregnancy loss after only two consecutive losses.¹ The incidence of recurrent pregnancy loss is estimated at 1%. Despite a wide range of investigations, no apparent cause is found in at least half the cases.²

Some studies have evaluated various aetiological factors in recurrent pregnancy loss.³⁻⁴ The rate of uterine abnormalities has ranged from 15% to 27% in these studies. However, the relationship between uterine abnormalities and recurrent pregnancy loss is uncertain and some authorities do not recommend routinely evaluating the uterine cavity by hysterosalpingography, hysteroscopy, or sonohysteroscopy.⁵ A few retrospective studies suggest that the diagnosis and surgical correction of these defects significantly increases subsequent full term deliveries.⁶⁻⁷ No prospective, controlled trials however have proved that the correction of uterine anatomic abnormalities improves the outcome for the next pregnancy.

Hysterosalpingography is the traditional method of investigation for uterine anomalies and tubal patency. Hysteroscopy and laparoscopy are the definitive diagnostic methods for evaluating intrauterine

abnormalities, structural uterine abnormalities and tubal patency. Hysterosalpingocontrastsonography (HyCoSy) is a combined transvaginal sonography with saline infusion and Echovist infusion into the uterine cavity. This is a recent alternative investigation for examining the uterine cavity and yields additional information about the myometrium, ovaries and tubal patency.⁸ The purpose of this study was to assess the value of HyCoSy in women where the indication for investigation is recurrent miscarriage.

Material and Methods

We reviewed all women who had a HyCoSy for recurrent miscarriage since the introduction of the service in July 1997 until June 2001. Data collected prospectively included age, parity, indication for referral, day of menstrual cycle, findings at baseline transvaginal scan, findings at HyCoSy (both with saline and Echovist), subsequent management and outcome.

Hysterosalpingocontrastsonography was performed between day 5 and 12 of the menstrual cycle. Women were advised to take oral analgesia one hour before the procedure. A preliminary transvaginal ultrasound was performed using a Logic 200 ultrasound system and a 6.5 –MHz endovaginal probe. The uterus and ovaries were assessed in longitudinal and coronal axis. A Cusco's speculum was inserted and the cervix was cleansed with saline. A size 5 French double lumen intrauterine catheter (Schering AG, Berlin) was inserted through the cervix into the uterine cavity. The balloon was inflated with 1-2 ml of air and gently withdrawn to the level of internal cervical os. The speculum was removed and the vaginal ultrasound probe was reintroduced. Negative hysterosonography using 5-10 ml of instilled saline was initially performed

Paper received on 1.2.02 ; accepted on 27/6/02

Correspondence :
Dr. Nirmala Kondaveeti
13, Charnwood Meadows, Clonsilla,
Dublin - 15, Ireland

and the uterine cavity viewed for intrauterine contour and intrauterine lesions (such as polyps, fibroids and septum) both in longitudinal and transverse axis.

The Echovist® (Schering AG, Berlin), which contains galactose micro-bubbles in solution was injected in 1-2 ml boluses. Patency of the fallopian tubes was ascertained by streaming of the contrast agent along its entire length or by streaming at the cornual end for at least 10 seconds with spill into the peritoneal cavity. The uterine cavity was assessed for filling defects. All women were discharged home within 30 minutes of the procedure. Women were advised to take oral analgesia if required over the next 12 hours.

Results

A total of 57 women had a HyCoSy for recurrent miscarriage. Of the 57, 22 were referred from other hospital and 35 from a general gynecology clinic and specialized infertility clinics. The age ranged between 20 and 44 years (mean 32.6). The number of previous miscarriages ranged between 2 and 10. The abnormalities following HyCoSy are shown in Table I. Associated polycystic ovarian disease was also observed in five women. The tubal patency was checked by an Echovist infusion. Fifty-two women showed bilateral patent tubes and one woman showed bilateral hydrosalpinges with block. Three women showed unilateral block. Tubal patency was inconclusive in two women in whom the catheter

Table I : Abnormal findings with HYCOSY for recurrent miscarriage

Abnormalities	(n=57)	%
Endometrial polyp	4	7%
Endometrial fibroid	4	7%
Bicornuate uterus	2	3.5%
Septum	4	7%
Adhesions	1	1.8%
Cervical incompetence	4	7%
Total	19	33%

Table II : Findings at HyCoSy for recurrent miscarriage in parous women compared to nulliparous women.

Findings	Women with living children (n=23)		Women with out living children (n=34)	
Polyp	3	13%	2	2.9%
Fibroid	1	4.3%	3	8.8%
Bicornuate uterus	1	4.3%	1	2.9%
Septum	1	4.3%	3	8.8%
Cervical incompetence	1	4.3%	3	8.8%
Adhesions	1	4.3%	0	-
Total	8	34.8%	11	32.4%

Table III : Findings at HyCoSy analysed by the number of previous miscarriages.

Findings	Miscarriage = 2 (n=25)		Miscarriage >2 (n=32)	
Polyp	1	4%	3	9.4%
Fibroid	1	4%	3	9.4%
Bicornuate uterus	1	4%	1	3.1%
Cervical incompetence	3	12%	1	3.1%
Septum	1	4%	3	9.4%
Adhesions	0	-	1	3.1%
Total	7	28%	12	37.5%

slipped out with inflated balloon (indicating cervical incompetence). The women with living children and the women with no living children are compared in Table II. The results showed no significant difference. The results were also analysed separately and compared in women with two previous miscarriages and those with more than two. The findings showed increased incidence of abnormalities in women with more miscarriages (Table III).

Following HyCoSy, six women had a hysteroscopic myomectomy, polypectomy and, two had a hysteroscopic septal resection. Twenty of the 35 women who were followed up in our hospital have become pregnant to date. Of these 20 women, two miscarried and 18 delivered a baby weighing 500 gm or more. Fifteen women had a full term live born baby. One woman had premature rupture of membranes, followed by preterm delivery at 24 weeks gestation and a neonatal death. This woman had three previous full term deliveries followed by four miscarriages and a partial septum was diagnosed at HyCoSy. Two other women had an intrauterine death with a stillbirth one of an Edward's syndrome baby and the other of an anencephalic baby. Among 15 live born deliveries three women had conceived after hysteroscopic fibroid resection. One woman (para 0¹⁰) delivered at term after a cervical suture.

Discussion

HyCoSy is a new procedure for examining the uterine cavity and determining the tubal patency. The present study confirms that in women with history of recurrent miscarriage, HyCoSy is well-tolerated as an outpatient procedure and provides clinically useful information in over one third of patients. The purpose of investigation in recurrent miscarriage is to evaluate the uterine cavity for distortion with fibroids or polyps, and to detect congenital abnormalities of müllerian tract and problems with cervical competence. In our study, the overall incidence of abnormal findings is 33%, which is similar to the 15% to 25% incidence of previous studies evaluating the aetiological factors of recurrent miscarriage using HSGs.²⁴ In one recent study however this incidence is 50%.¹⁰ The reasons for high rate of abnormalities were attributed to advanced maternal age of patients with increased acquired defects such as polyps, myomas and increased sensitivity of sonohysterography in detecting uterine abnormalities. Also selection bias introduced by subjects referred to tertiary center focused on recurrent miscarriage. The same reasons may apply to our study as we also have similar study setting.

The advantages of HyCoSy over conventional hysterosalpingography (HSG) are the absence of radiation and greater versatility than HSG because the uterus can be scanned in various projections at the same time as the tubes are being examined. Further advantages are the simultaneous assessment of the ovaries and the entire pelvis. Several studies compared the efficacy of HyCoSy with that of the conventional HSG and concluded that HyCoSy is superior in delineation of the uterine cavity with less discomfort.

The advantages of HyCoSy over hysteroscopy are the avoidance of general anaesthesia, lesser cost and non-invasiveness. Moreover HyCoSy is able to delineate the intramural extension of myomas, and can also differentiate between polyps and myomas with simultaneous assessment of the ovaries. By providing information about depth of myomas, it facilitates a plan for preoperative treatment with GnRH analogue before hysteroscopic resection of fibroid. Few studies have evaluated and compared the sensitivity of HyCoSy with that of hysteroscopy and concluded that HyCoSy has the same efficacy rate with minimal discomfort.¹¹⁻¹³ For HyCoSy anaesthesia is not required but to avoid discomfort during the procedure patients should be advised to take mild analgesics one hour before the procedure. A few patients may experience a vaso-vagal response during the inflation of the balloon.

Inability to insert the catheter can occur in a few women but as we used flexible catheter we did not encounter this problem. We do not usually use a tenaculum to stabilise the cervix. Inadequate distention of the cavity can occur while using the catheter without a balloon. By inflating the balloon, we not only prevent slipping of catheter but also inject minimal amount of fluid which causes less discomfort to the patient.

The decision whether to screen for chlamydial and gonococcal infections or use prophylactic antibiotics depends on the patient's history. In our study we used prophylactic antibiotics only for those women who had a history of suspected pelvic infection.

References

1. Knudsen UB, Hansen V, Juul S. Prognosis of a new pregnancy following previous spontaneous abortions. *Int J Obstet Gynecol Reprod Biol* 1991; 39: 31-5.
2. Stirrat GM. Recurrent Miscarriage, I; Definition and Epidemiology. *Lancet* 1990; 336: 673-5.

3. Stray Pedersen B, Stray Pederson S. Etiologic factors and subsequent reproductive performances in 195 couples with a prior history of habitual abortion. *Am J Obstet Gynecol.* 1984; 148: 140 - 6.
4. Tho PT, Byrd JR, McDonough PG. Etiologies and subsequent reproductive performance of 100 couples with recurrent abortion. *Fertil Steril* 1979; 32:389 -95.
5. Royal College of Obstetrician & Gynecologists. The management of recurrent miscarriage. *RCOG Guideline 17. London; RCOG, 1998 (level III).*
6. March CM, Israel R. Hysteroscopic management of recurrent abortion caused by septate uterus. *Am J Obstet Gynecol* 1987; 156 : 834 - 42.
7. Valle RF, Sciana JJ. Intrauterine adhesions: hysteroscopic diagnosis, classification, treatment and reproductive out-come. *Am J Obstet Gynecol* 1998; 158: 1459 - 70.
8. Corsen S, Brooks PG. Resectoscopic myomectomy. *Fertil Steril* 1991; 55: 1041 - 4.
9. Skinner J, Leavy J, Stuart BJ et al. Hysterosalpingocontratsonography in clinical practice. *J Obstetrics and Gynecology*, 2000, 20:171 - 4.
10. Keltz M, Olive D, Kim A, Aydin A. Sonohysterography for screening in recurrent pregnancy loss. *Fertil Steril.* 1997; 67: 670 - 4.
11. F Degenhardt. S Jibril. B Eisenhauer. Hysterosalpingo-contrast sonography (HyCoSy) for examining tubal patency. *Clinical Radiol* 1996; 51: 15 - 8.
12. JM Goldberg, T Falcome, M Attaran. Sonohysterography evaluation of uterine abnormalities noted on hysterosalpingography. *Human Reprod* 1997; 12: 2151 - 3.
13. T Widrich, D Bradley, R Michinson et al. Comparison of saline infusion sonography with office hysteroscopy for the evaluation of the endometrium. *Am J Obstet Gynecol* 1996; 174: 1327 - 34.
14. G Ayida, P Chamberlain, D Barlow et al. Uterine cavity assessment prior to in vitro fertilization : comparison of transvaginal scanning, saline contrast hystero-graphy and hysteroscopy. *Ultrasound Obstet Gynecol* 1997; 10:59 - 62.
15. Gronlund L. Heltz J, Helm P et al. Transvaginal sonohysterography and hysteroscopy in the evaluation of female infertility, habitual abortion or menorrhagia. Comparative study. *Acta Obstet Gynecol Scand* 1999; 78:415 - 8.