Randomised trial of hysterectomy, endometrial laser ablation, and transcervical endometrial resection for dysfunctional uterine bleeding

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Abstract

***Objective*—To evaluate the effectiveness and safety of endometrial laser ablation and transcervical resection of the endometrium compared with hysterectomy in the surgical treatment of women with dysfunctional uterine bleeding.**

***Design*—Prospective randomised controlled trial.**

***Setting*—Gynaecology department of a large teaching hospital.**

***Subjects*—204 women who would otherwise have been undergoing hysterectomy for menorrhagia were recruited between August 1990 and March 1992 and randomly allocated to hysterectomy (n=99) or conservative (hysteroscopic) surgery (transcervical resection (n=52) and laser ablation (n=53)).**

***Main outcome measures*—Operative complications, postoperative recovery, relief of menstrual and other symptoms, patient satisfaction with treatment after six and 12 months.**

***Results*—Women treated by hysteroscopic surgery had less early morbidity and a significantly shorter recovery period than those treated by hysterectomy (median time to full recovery 2-4 weeks *v* 2-3 months, $P<0.001$). Twelve months later 17 women in the hysteroscopy group had had a hysterectomy, 11 for continuing symptoms; 11 women had had a repeat hysteroscopic procedure; 45 were amenorrhoeic or had only a brown discharge; and 35 had light periods. Dysmenorrhoea and premenstrual symptoms improved in most women in both groups. After 12 months 89% (79/89) in the hysterectomy group and 78% (75/96) in the hysteroscopy group were very satisfied with the effect of surgery ($P<0.05$); 95% (85/89) and 90% (86/96) thought that there had been an acceptable improvement in symptoms, and 72% (64/89) and 71% (68/96) would recommend the same operation to others.**

***Conclusions*—Hysteroscopic endometrial ablation was superior to hysterectomy in terms of operative complications and postoperative recovery. Satisfaction after hysterectomy was significantly higher, but between 70% and 90% of the women were satisfied with the outcome of hysteroscopic surgery. Hysteroscopic surgery can be recommended as an alternative to hysterectomy for dysfunctional uterine bleeding.**

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Introduction

Many women attending hospital gynaecology clinics with menorrhagia eventually undergo hysterectomy.[1] This is one of the most commonly performed major operations in the United Kingdom, where a woman's lifetime risk of hysterectomy is estimated to be 20%.[2,3] In Scotland the rate doubled between 1961 and 1984 mainly because of an increase in operations for menstrual disorders in women aged 35 to 44.[2] Although mortality from hysterectomy is low, postoperative morbidity is common.[4,5]

Hysteroscopic endometrial laser ablation and transcervical endometrial resection are recently introduced options.[6,7] It is important to establish the safety and effectiveness of any new treatment, whether surgical or medical, and this can be properly achieved only in randomised trials. Concern has been expressed about serious complications occurring during hysteroscopic surgery.[8] Many published reports are of small numbers of selected women with limited follow up, and it is therefore impossible to make assumptions about the implications if these operations were to replace hysterectomy, which has a high rate of patient satisfaction.[9,10]

We evaluated hysteroscopic surgery in comparison with hysterectomy in women with dysfunctional uterine bleeding. We compared operative complications, postoperative recovery, clinical outcomes, and patient satisfaction with the two types of procedure. Psychosocial outcomes and a cost-benefit analysis will be described in other papers.

The effectiveness of any new technique increases as experience is gained. If its effectiveness is assessed too soon the new technique will be judged to be inferior to established procedures but if assessment is delayed the new technique may have become too established to carry out randomised studies. To achieve a balance, our trial started six months after the simultaneous introduction of laser ablation and endometrial resection at this hospital.

Patients and methods

Women were eligible to enter the study if they were under 50 years of age, weighed under 100 kg, had a clinical diagnosis of dysfunctional uterine bleeding (uterus less than size of a pregnancy of 10 weeks, and normal endometrial histology), and would otherwise have been undergoing hysterectomy. They were recruited from the general gynaecology clinics of all consultants at this large teaching hospital.

The study aimed at recruiting at least 160 women to give 80% power of detection at the 5% significance level difference of 20% between hysterectomy and hysteroscopic surgery on the basis of reported satisfaction rates of 86% after hysterectomy.[10] Although randomisation was primarily between hysterectomy and conservative surgery, those randomly allocated to conservative surgery were also randomly assigned to laser ablation or endometrial resection. With the anticipated numbers, the study would have had only a power of 50% in detecting a similar difference between these two methods, but we hoped that the women could be included in the analysis of a subsequent trial comparing the two hysteroscopic operations alone. A series of numbered opaque envelopes contained the

treatment options in a random order, with a ratio of two hysterectomies to one laser ablation and one endometrial resection.

A questionnaire on symptoms was completed before randomisation and one, six, and 12 months after treatment. Women were asked to grade heaviness and pain on a scale of five points for each day of their period, and these scores were added to give a total score for each variable. A linear analogue scale (10 cm) was used to measure perceived postoperative pain.

Women randomly allocated to conservative surgery had a vaginal ultrasound scan, but to avoid prerandomisation bias preoperative hysteroscopy was not performed. The gonadotrophin releasing hormone agonist analogue goserelin was given five weeks preoperatively to prepare the endometrium.

Patients undergoing laser ablation were treated by the contact method.[6] The irrigating fluid (0·9% sodium chloride) was infused under gravity. A quartz fibre (600-800 μm) transmitted the laser energy at a power of 80 W from a Sharplan neodymium yttrium aluminium garnet laser. Patients randomly allocated endometrial resection were treated by rollerball coagulation of the cornua with resection of the rest of the cavity with a loop (7 mm in diameter); glycine (1·5%) was the irrigating medium. Patients randomly allocated hysterectomy were treated according to normal practice.

Analysis was by intention to treat using the statistical package for the social sciences (SPSS-PC) with calculation of confidence intervals when appropriate. The Student's t test was used for normally distributed variables, and the Mann-Whitney U test for ordinal or non-normally distributed variables. The standard χ^2 test was used for unpaired categorical data, and McNemar's χ^2 test for paired categorical data arising from comparisons of postoperative and preoperative symptoms in the same woman.

TABLE I—*Preoperative patient characteristics by allocated treatment. Values are numbers (percentages) of women unless stated otherwise*

	Hysterectomy (n=99)	Endometrial laser ablation (n=53)	Transcervical resection of endometrium (n=52)
Mean (SD) age (years)	40·3 (5·2)	39·6 (5·6)	40·5 (4·5)
Social status:			
Married/steady partner	92 (93)	49 (92)	45 (87)
Employed	79 (80)	42 (79)	37 (71)
Mean No (SD) of children	2·3 (0·9)	2·5 (1·0)	2·5 (0·9)
Sterilised or partner with vasectomy	80 (81)	47 (89)	43 (83)
Menstrual symptoms:			
Irregular periods	52 (53)	28 (53)	24 (46)
Regular dysmenorrhoea	68 (69)	40 (75)	39 (75)
Duration more than 2 years	83 (84)	48 (91)	46 (88)
Cycle less than 4 weeks	70 (71)	35 (66)	32 (62)
More than 7 days of bleeding	57 (58)	26 (49)	36 (69)
Mean (SD) score for:			
Bleeding	27·5 (9·2)	26·2 (8·4)	27·5 (9·2)
Pain	10·2 (10·9)	9·5 (8·4)	10·4 (11·1)
Premenstrual symptoms:			
Bloating	92 (93)	47 (89)	50 (96)
Breast discomfort	73 (74)	33 (62)	34 (65)
Irritability	75 (76)	45 (85)	41 (79)
Headaches	53 (54)	27 (51)	30 (58)
Depression	56 (57)	31 (58)	25 (48)
Other symptoms:			
Urological	53 (54)	25 (47)	26 (50)
Bowel	22 (22)	13 (25)	20 (38)
Flushes	46 (46)	25 (47)	25 (48)
Dyspareunia	52 (53)	34 (64)	21 (40)

TABLE II—*Operative details for, early complications of, and postoperative recovery after hysterectomy and conservative surgery*

	Hysterectomy (n=97)	Conservative (n=105)	P value
Operative details:			
Mean (SD) time of operation (min)	61·4 (21·9)	44·8 (13·7)	<0·001*
Mean No of nights in hospital	7·3	2·5	<0·001
No (%) of women requiring analgesia:			
By injection	86 (89)	28 (27	<0·001
Orally	93 (96)	68 (65)	<0·001
Mean (SD) pain score (cm)	5·2 (3·0)	2·6 (2·9)	<0·001†
No (%) of patients with complications:			
Anaesthetic	2 (2)	0	
Haemorrhage	5 (5)	6 (6)	NS
Blood transfusion	5 (5)	1 (1)	
Vault haematoma	11 (11)		
Wound haematoma	14 (14)		
Infection (all)	46 (47)	16 (15)	<0·001
Chest infection	7 (7)	2 (2)	NS
Pelvic infection	9 (9)	9 (9)	NS
Urine infection	22 (23)	6 (6)	<0·001
Wound infection	13 (13)		
Fluid overload (>1 l)	1 (1)	12 (11)	
Perforation		1 (1)	
Gastrointestinal obstruction/ileus	2 (2)	1 (1)	NS
Laparotomy	3 (3)	1 (1)	NS
Readmission	4 (4)	3 (3)	NS
Postoperative recovery (median time):			
Of vaginal discharge (weeks)	1	2-3	<0·001
Of bleeding	None	<1 Week	<0·001
Of pain duration (weeks)	1-2	<1	<0·001
Till full recovery	2-3 months	2-4 weeks	<0·001
Till return to work	2-3 months	2-4 weeks	<0·001

*Difference 16·6 min (11·6 to 21·6 min). †Difference 2·6 cm (1·8 to 3·4 cm).

Results

Unless stated otherwise, the results are presented as a comparison between hysterectomy and hysteroscopic surgery. The two conservative groups were compared for all variables, and no significant differences were identified. As outlined in the methods, however, the power of the study was not great enough to state conclusively that there were no differences between laser ablation and endometrial resection.

RECRUITMENT AND WITHDRAWALS

Two hundred and four eligible women gave written consent to the trial and were randomly allocated to hysterectomy (99), endometrial resection (52), or laser ablation (53). Two women withdrew before treatment, and four women refused the allocated treatment. The treatments carried out were 99 hysterectomies, 51 laser ablations, and 52 endometrial resections. One woman with unsuspected early endometrial carcinoma was withdrawn after hysterectomy. After one, six, and 12 months 195, 180, and 185 respectively attended for follow up.

PATIENT CHARACTERISTICS

Table I gives the preoperative details of women in the three treatment groups. There were no significant differences for any variables between women in the hysterectomy and hysteroscopy groups or between women in the laser and resection groups. Two hundred women of the 204 women had had medical treatment for menorrhagia.

OPERATIVE DETAILS

In the hysteroscopy group surgery had to be abandoned before completion in eight cases—four were completed as a two stage procedure and three women had a hysterectomy. Seven women were sterilised, one by minilaparotomy. There were no other immediate unplanned procedures (laparoscopy or laparotomy) in this group. Abdominal hysterectomy was performed in 87 women, six of whom had bilateral salpingo-oophorectomy and one a subtotal hysterectomy. Vaginal hysterectomy was performed in 12 women.

Table II shows the mean duration of the operation, the requirements for analgesia, pain scores, and the mean stay in hospital. The only significant differences between laser and resection were the time spent in the operating theatre (mean 50·3 (SD 15·8) min v 39·9 (11·1) min, $P<0·001$) and the amount of fluid absorbed (766 ml v 414 ml, $P=0·02$). Table III shows the pathological findings.

COMPLICATIONS

Five women in the hysterectomy group had major complications. Two of these were from the anaesthetic; one woman had intra-abdominal bleeding and two

women had pelvic abscesses. One woman given laser ablation had a small bowel obstruction, which required laparotomy and was the only serious complication in the hysteroscopy group. One woman had an uncomplicated uterine performance. No patient had symptomatic fluid overload.

Other complications were minor and significantly more common in the hysterectomy group (table II). In particular, infectious morbidity was significantly reduced in the hysteroscopic surgery group (difference −32% (95% confidence interval −20% to −40%, $P<0.001$). One woman had symptomatic haematometra. Another was 12 weeks pregnant when seen six months after resection; she opted for termination.

TABLE III—*Pathological findings at laparotomy or hysteroscopy and on histology of uterine and endometrial specimens*

	Hysterectomy	Conservative
	Clinical findings	
No of women	97	104
None	62 (64)	74 (71)
Fibroids	11 (11)	21 (20)
Endometriosis	8 (8)	1 (1)
Adhesions	8 (8)	1 (1)
Ovarian cyst	7 (7)	
Polyps		6 (6)
Other	1 (1)	1 (1)
	Histological findings	
No of women	93	55*
None	31 (33)	38 (69)
Fibroids	36 (39)	7 (13)
Endometriosis	4 (4)	
Adenomyosis	16 (17)	8 (15)
Ovarian cyst	2 (2)†	
Endometrial cancer	1 (1)	
Other	3 (3)	2 (4)

*Transcervical endometrial resection only.
†Simple cysts only.

TABLE IV—*Menstrual symptoms preoperatively and six and 12 months after conservative surgery. Values are numbers or proportions* (percentages) of women unless stated otherwise*

	Preoperative (n=105)	After 6 months (n=96)	After 12 months (n=96)
Menstrual status:			
Amenorrhoea		19 (20)	21 (22)
Hypomenorrhoea		58 (60)	59 (62)
Same		13 (14)	3 (3)
Heavier		1 (1)	
Hysterectomy		5 (5)	13 (14)
Cycle length (weeks):			
>3	82 (78)	58/72 (82)	60/62 (95)
≤3	23 (22)	13/72 (18)	3/62 (5)
Duration of bleeding (days):			
<5	5 (5)	37/72 (51)	44/61 (72)
5 to 7	38 (36)	27/72 (38)	13/61 (21)
>7	62 (59)	8/72 (11)	4/61 (7)
Regularity of periods:			
Regular	53 (50)		52/67 (78)
Irregular	52 (50)		15/67 (22)
Dysmenorrhoea:			
None	14 (13)	21/78 (27)	33/79 (42)
Less		25/78 (32)	34/79 (43)
Same		19/78 (24)	4/79 (5)
Worse		13/78 (17)	8/79 (10)
Mean score (95% confidence interval):			
Bleeding	26·8 (25·2 to 28·5)	9·1 (6·4 to 11·8)	4·5 (3·2 to 5·7)
Pain	10·0 (8·1 to 11·8)	7·2 (4·7 to 9·7)	3·6 (2·4 to 4·7)

*Of those responding in self report questionnaires at follow up.

RECOVERY AFTER SURGERY

The median duration of vaginal discharge, bleeding, and postoperative pain and the median time to full recovery are shown in table II. By four weeks 10 (11%) of the hysterectomy group and 61 (68%) of the hysteroscopy group had resumed intercourse; 14 (15%) of the hysterectomy group and 83 (80%) of the hysteroscopy group felt fully recovered (difference 65% (54% to 76%) $P<0.001$) and 59 (42% of those who worked) had returned to work (only three after hysterectomy; $P<0.001$). After six months seven women in the hysteroscopy group and 10 in the hysterectomy group said that they had not yet recovered. All but one of those who worked were back at work.

RESULTS OF SURGERY

Menstrual and other symptoms

Six women randomly assigned to conservative treatment had had a hysterectomy within six months. When we reviewed the case notes 17 women in the conservative group had had a hysterectomy within 12 months, 11 for continuing menstrual symptoms. Of these 11 women who had had a hysterectomy for failure of conservative surgery, four had no histological evidence of disease, three had fibroids, and four had adenomyosis. Eleven women had undergone repeat hysteroscopic surgery for continuing symptoms between six and 12 months later.

Table IV shows the menstrual status of the conservative group at follow up. Although amenorrhoeic, 13 women in the hysterectomy arm experienced regular abdominal pain at 12 months. Four women in the conservative arm also had pain after hysterectomy.

Table V shows the prevalence of postoperative urological and gastrointestinal symptoms, dyspareunia, premenstrual symptoms, and flushes compared with preoperative values. Premenstrual-type symptoms improved after both hysterectomy and hysteroscopic surgery.

Patient satisfaction

Table VI shows a significant preference of hysterec-

TABLE V—*Urinary, bowel, premenstrual, and menopausal symptoms and dyspareunia preoperatively and six and 12 months after hysterectomy or conservative surgery. Values are numbers (percentages) of women unless stated otherwise*

		After 6 months		After 12 months		Pooled difference (%) between preoperative and 12 months*	
	Preoperative (both groups) (n=204)	Hysterectomy (n=84)	Conservative surgery (n=96)	Hysterectomy (n=89)	Conservative surgery (n=96)	95% Confidence interval	P value
Urinary symptoms	104 (51)	57 (68)	67 (70)	70 (79)	67 (70)	17 to 30	<0·001†
Incontinence:							
Stress	81 (40)	17 (20)	31 (32)	26 (29)	31 (32)	−14 to 1	NS
Urge	21 (10)	16 (19)	14 (15)	21 (24)	11 (11)‡	NA	<0·05
Bowel symptoms	55 (27)	29 (34)	25 (26)	34 (38)	35 (36)	3 to 17	<0·01
Dyspareunia (proportion (%) of those sexually active)	85/182 (47)	41/78 (53)	54/90 (60)	35/80 (44)	36/85 (42)	−10 to 9	NS
Premenstrual symptoms:							
Breast discomfort	140 (69)	37 (44)	61 (64)‖	46 (52)	57 (59)	−18 to −3	<0·01
Bloating	189 (93)	36 (43)	66 (69)¶	45 (51)	60 (62)	−37 to −31	<0·001
Irritability	161 (79)	33 (39)	59 (61)**	40 (45)	57 (59)	−31 to −20	<0·001
Headaches	110 (54)	28 (33)	45 (47)	29 (33)	38 (40)	−23 to −6	<0·001
Depression	112 (55)	22 (26)	32 (33)	23 (26)	28 (29)	−33 to −17	<0·001
Flushes	96 (47)	47 (56)	51 (53)	49 (55)	55 (57)	−1 to 16	NS

*With the exception of urge incontinence, no variables were significantly different between hysterectomy and conservative surgery so confidence intervals for changes between preoperative and postoperative symptoms at 12 months are based on data pooled across both types of operation.
†Women tended to overreport nocturia in self report questionnaires, which accounts for increase in overall urinary symptoms.
‡$P<0.05$, odds ratio 2·39 (95% confidence interval 1·01 to 5·71); ‖$P<0.05$, odds ration 2·21 (1·17 to 4·22); ¶$P<0.001$, odds ratio 2·93 (1·52 to 5·67); **$P<0.01$, odds ratio 2·46 (1·29 to 4·71).

TABLE VI—*Patient satisfaction six and 12 months after hysterectomy or conservative surgery*

	After 6 months		After 12 months	
	Hysterectomy (n=84)	Conservative (n=96)	Hysterectomy (n=89)	Conservative (n=96)
How does your general health compare with that a year ago?:				
Much better			65 (73)	46 (48)
Better			20 (23)	32 (33)
Same			2 (2)	16 (17)
Worse			1 (1)	2 (2)
Much worse			1 (1)	0
P value			<0·001	
What effect has the operation had on symptoms?:				
No effect	2 (2)	9 (9)		4 (4)
Insufficient improvement	4 (5)	22 (23)	4 (5)	6 (6)
Acceptable improvement	28 (34)	41 (43)	26 (29)	53 (55)
Cured	49 (59)	24 (25)	59 (66)	33 (34)
P value	<0·001		<0·001	
How satisfied are you with the effect of treatment?				
Very satisfied			79 (89)	75 (78)
Moderately satisfied			9 (10)	17 (18)
Dissatisfied				4 (4)
Very dissatisfied			1 (1)	
P value			<0·05	

tomy, judged by all three criteria. When asked which operation they would recommend to others, women tended towards hysteroscopy at one month ($P < 0.001$), but there were no significant differences six and 12 months later, with 71% (68/96) of the conservative group recommending the same procedure compared with 72% (64/89) of the hysterectomy group.

Discussion

The main objective of this pragmatic trial was to compare the effectiveness of hysteroscopic procedures with hysterectomy for treatment of dysfunctional uterine bleeding using the clinical outcome measures of patient satisfaction and women's perception of the treatment. To our knowledge, only two randomised trials, both comparing endometrial resection with hysterectomy, have previously been reported.[11 12] A group having no treatment or medical treatment alone was not feasible as most of the women had already been dissatisfied with medical treatment. Blood loss was not measured objectively, as this is not usually clinical practice, which might have produced a biased study population.

We have shown that in experienced hands or when performed under supervision endometrial laser ablation and transcervical endometrial resection are superior to hysterectomy in terms of intraoperative and postoperative morbidity, the one serious complication being bowel damage similar to that described previously.[13] The rate of uterine perforation was low, in contrast with most other reports of endometrial resection,[8 12 14 15] which can perhaps be explained by the good uterine preparation achieved by treatment with an analogue of gonadotrophin releasing hormone or by the use of a small diameter loop. The high incidence of minor morbidity, principally infection, in the hysterectomy group is similar to that previously reported.[4 5 12]

Although hysteroscopic operations were significantly shorter than hysterectomy, the times entailed are of doubtful clinical significance. Of more relevance are the stay in hospital and postoperative recovery period, which were significantly reduced in the conservative group. This is perhaps the greatest benefit of hysteroscopic surgery. For geographical reasons few women were treated as day cases.

RELIEF OF SYMPTOMS

The most important consideration, however, is relief of the symptoms that prompted surgical treatment. Hysterectomy guarantees amenorrhoea and has a high rate of satisfaction.[9 10 12] By comparison, only 22% of those treated by hysteroscopic surgery were amenorrhoeic at 12 months, although a further 62% were hypomenorrhoeic. The rate of amenorrhoea is similar to that in some reports of women followed up for 12 months or more[14 16] but is less than that in others.[17 18] When we included only women with brown discharge the rate increased to 47%, which may explain the differences. The overall success rate is similar to that in many reports,[11 14 15] though not as good as some,[12 17 18] but these included varying definitions of success and follow up intervals.

Most women also had dysmenorrhoea, which usually improved postoperatively. However, 15% continued to have abdominal pain after hysterectomy, and 10% of the conservative group at 12 months had increased pain. Anecdotal evidence suggesting that hysteroscopic ablation is less suitable for women with dysmenorrhoea is not borne out in our trial, and women can be reassured that menstrual pain will probably improve. Premenstrual-type symptoms were also relieved in many women, with significant differences in favour of hysterectomy at six months but no difference at 12 months between the two groups. Improvement in premenstrual symptoms after hysterectomy[19] and laser ablation[20] has previously been noted.

An association has been made between hysterectomy and urinary problems, although there have been few prospective studies.[21] Women in this study had a high incidence of urinary and bowel symptoms preoperatively, but except for the symptom of urge incontinence at 12 months, there were no significant differences between the two groups postoperatively.

SATISFACTION WITH AND EFFICACY OF TREATMENTS

When asked to assess overall satisfaction with treatment, a significantly greater proportion of women in the hysterectomy group thought that they had been cured, though this may be related to complete resolution of bleeding. We found a high efficacy of endometrial ablation in treating menstrual problems, with satisfaction rates of 70-90% even though an appreciable proportion of women required a second procedure. Women with irregular menstrual cycles, fibroids, adenomyosis, pain, or premenstrual symptoms were just as likely to have a successful outcome after hysteroscopic surgery as women without these conditions, making it a useful alternative to hysterectomy.

Further follow up of these women will enable us to confirm or refute some of the long term sequelae of hysterectomy for menstrual problems, such as premature ovarian failure[22] and an increased risk of cardiovascular disease,[23] since no previous studies have had a control group of women with dysfunctional bleeding randomised to an alternative treatment. It may also detect any possible long term complications of hysteroscopic surgery and determine whether adenomyosis is an important cause of failure of treatment. A second phase study, currently in progress, randomising solely between endometrial resection and laser ablation will allow valid comparisons to be made between the two methods.

There is a risk that the minimally invasive nature of hysteroscopic surgery will result in a considerable number of procedures being performed as an alternative to initial medical treatment. These operations, however, are not minor and have resulted in perioperative deaths,[8] so this intervention needs to be justified. Its effectiveness in our trial and its reduced morbidity, stay in hospital, and recovery period give it an advantage over hysterectomy.

CONCLUSION

In conclusion, endometrial ablation compares favourably with hysterectomy in the treatment of dysfunctional uterine bleeding. Although hysterectomy is superior in terms of overall satisfaction,

Clinical implications

- Hysteroscopic surgery for dysfunctional uterine bleeding has significantly less morbidity and a significantly reduced hospital stay and recovery period compared with hysterectomy
- This randomised trial of hysterectomy and hysteroscopic surgery found that 12 months after the conservative surgery around 80% of women were amenorrhoeic or hypomenorrhoeic
- Dysmenorrhoea and premenstrual symptoms also improved in most women after operative treatment for dysfunctional uterine bleeding
- Although satisfaction with hysterectomy was significantly higher, around 80% of the women who would currently have been treated by hysterectomy were entirely satisfied with the effect of hysteroscopic surgery
- Gynaecologists should be encouraged to offer hysteroscopic surgery as first line surgical treatment for dysfunctional uterine bleeding

it is associated with greater morbidity. Hysteroscopic surgery can be recommended and should be encouraged as an alternative for the majority of women when more conservative treatment has failed.

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Glycated haemoglobin values: problems in assessing blood glucose control in diabetes mellitus

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Abstract

***Objective*—To see whether two measures of glycated haemoglobin concentration—the haemoglobin A_1 (HbA_1) value and the haemoglobin A1c (HbA_{1c}) value—assess blood glucose control differently in diabetes.**

***Design*—Diabetic patients had glycaemic control assessed on the basis of HbA_1 and HbA_{1c} values measured by the same high performance liquid chromatography instrument and on the basis of HbA_1 measured by electrophoresis.**

***Setting*—A diabetic outpatient clinic.**

***Subjects*—208 diabetic patients and 106 non-diabetic controls.**

***Main outcome measures*—Glycated haemoglobin concentrations classified according to European guidelines as representing good, borderline, or poor glycaemic control by using standard deviations from a reference mean.**

***Results*—Fewer patients were in good control (25;12%) and more poorly controlled (157;75%) as assessed by the HbA_{1c} value compared with both HbA_1 assays (39 (19%) and 130 (63%) respectively when using high performance liquid chromatography; 63 (30%) and 74 (36%) when using electrophoresis). The median patient value was 8·0 SD from the reference mean when using HbA_{1c}, 5·9 when using HbA_1 measured by the same high performance liquid chromatography method, and 4·1 when using HbA_1 measured by electrophoresis.**

***Conclusions*—Large differences exist between HbA_1 and HbA_{1c} in the classification of glycaemic control in diabetic patients. The HbA_{1c} value may suggest a patient is at a high risk of long term diabetic complications when the HbA_1 value may not. Better standardisation of glycated haemoglobin measurements is advisable.**

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Introduction

Over the past decade measurement of glycated haemoglobin concentration has brought a major advance in the assessment of glycaemic control in diabetes mellitus by providing an objective indication of a patient's overall blood glucose control for the preceding six to eight weeks.[1] The term glycated haemoglobin encompasses both haemoglobin A_1 (HbA_1) and haemoglobin A_{1c} (HbA_{1c}). HbA_1 refers to the non-enzymatic binding of several species of carbohydrate to haemoglobin, whereas in HbA_{1c} the carbohydrate is specifically glucose.[2]

The desirability of good glycaemic control in insulin dependent diabetes mellitus has been reinforced by the diabetes control and complications trial, which showed