ORIGINAL ARTICLE

An audit on hysterectomy for benign diseases in public hospitals in Hong Kong

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Objective To assess the standard of hysterectomy in public hospitals in Hong Kong, so as to improve the quality of patient care and outcome.

Design Clinical audit.

Setting Twelve Hong Kong Hospital Authority public hospitals.

Patients All patients undergoing hysterectomy for benign gynaecological conditions during the period from 1 July 2002 to 31 December 2002 inclusive.

Results A total of 1330 patients were included for analysis: 934 (70.2%) having abdominal hysterectomies, 184 (13.8%) having laparoscopic hysterectomies, and 212 (15.9%) undergoing vaginal hysterectomies. Uterine fibroids constituted the commonest indication for abdominal (73.7%) and laparoscopic (61.4%) hysterectomies, while genital prolapse was the most common indication (96.2%) for vaginal hysterectomy. The majority of patients undergoing laparoscopic and vaginal hysterectomy (86.3% and 84.8% respectively) were given prophylactic antibiotics, in contrast to only 45.8% of those undergoing abdominal hysterectomy. In all, 85.8% of the abdominal and vaginal hysterectomies performed by trainees were supervised, while for trainees performing laparoscopic hysterectomy, all had specialists as their first assistant. The overall incidence of complications for vaginal hysterectomy was lower than that for both abdominal hysterectomy ($P<0.001$) and laparoscopic hysterectomy ($P<0.05$). Infectious morbidity was significantly higher in patients undergoing abdominal hysterectomy without prophylactic antibiotics.

Conclusion The overall incidence of complications was lower for vaginal hysterectomies, as compared to both abdominal and laparoscopic hysterectomies, whereas the risk of urinary tract injury was significantly higher for laparoscopic hysterectomy. According to our audit, the level of supervision for the trainees was high. However, routine antibiotic prophylaxis should be more consistently used in the territory.

Key words
Audit; Hysterectomy

Hong Kong Med J 2007;13:187-93

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Introduction

Hysterectomy is the most common major gynaecological operation performed in Hong Kong. There are three different approaches: abdominal hysterectomy (AH), vaginal hysterectomy (VH), and laparoscopic hysterectomy (LH). In 1994, a total of 3036 AH and 340 VH procedures were performed for benign gynaecological conditions; the numbers having LH was not captured as laparoscopic surgery was generally not well-established at that time.[1] In 1999, the total number of hysterectomies increased to 4139, of which 3455 (83.5%) were performed abdominally, 451 (10.9%) vaginally, and 233 (5.6%) laparoscopically.[2] The overall complication rate was 7.6% for AH, 8.2% for VH, and 10.3% for LH. The proportion undergoing the abdominal approach was much higher than that in the United Kingdom, although the overall complication rate (for all approaches) was similar.[3] To gain a better understanding of the practice, indications, and complications of the various types of hysterectomies performed for benign gynaecological conditions in local public hospitals, the Hong Kong Hospital Authority Quality Assurance Subcommittee in Obstetrics and Gynaecology initiated this clinical audit.

香港公立醫院因良性婦科病症而進行的子宮切除術的審計

目的 評估香港公立醫院子宮切除術的標準，以改善病人護理及術後結果的質素。

設計 臨床審計。

安排 香港醫院管理局轄下的12間公立醫院。

患者 2002年7月1日至12月31日期間因良性婦科病症接受子宮切除術的病例。

結果 是次審計分析了1330例全子宮切除術，934例(70.2%)屬開腹手術，184例(13.8%)屬腹腔鏡手術，212例(15.9%)屬陰式手術。子宮肌瘤是開腹手術(73.7%)和腹腔鏡手術(61.4%)最常見的適應症，而生殖器脫垂是陰式手術(96.2%)的主要適應症。術前抗生素用於大部份腹腔鏡手術(86.3%)和陰式手術(84.8%)的病例，但只用於45.8%的開腹手術病例。由陪訓醫生進行的開腹手術和陰式手術中，85.8%是在專科醫生監察下進行的；至於由陪訓醫生進行的腹腔鏡手術，全部均有專科醫生作第一副手。陰式手術的整體併發症發生率少於開腹手術(P<0.001)和腹腔鏡手術(P<0.05)。沒有使用術前抗生素的開腹手術病例，術後感染率則較高。

結論 陰式手術併發症的發生率較開腹手術和腹腔鏡手術為低，腹腔鏡手術的膀胱及輸尿管損傷則較開腹手術高。此審計顯示出受訓中的醫生在進行子宮切除術時，有高度的監察。術前抗生素的使用應常規化。

Methods

The audit was conducted between 1 July 2002 and 31 December 2002. All the 12 Hospital Authority hospitals with an in-patient gynaecological service participated. During the relevant period, each hospital was required to complete a specially designed audit forms for all patients undergoing hysterectomy for benign conditions. Hysterectomies performed for pre-malignant condition or suspected malignancy, were included to ensure comprehensive recruitment. A co-ordinator, usually a senior doctor in the department from each hospital, was assigned to ensure completeness and accuracy of the data collection. Emphasis was placed on checking for delayed postoperative complications. However, the actual arrangements and the staff assigned for data entry rested with the individual department and varied from hospital to hospital. There was no random selection of hospital records for verification of data entry. If essential information was missing, such data were requested from the respective hospital.

Preoperative information including patient demographics, major medical history, nature of any previous abdominal operations, haemoglobin level, indications for hysterectomy, and use of prophylactic antibiotics was collected. Operative information included: the qualification of the surgeons, type of hysterectomy, nature of incision, size of uterus, presence of adhesions, performance of prophylactic oophorectomy, operating time, blood loss, intra-operative transfusion, operative complications, and length of hospital stay. The surgeons were classified into: specialists (if they had the Fellowship of the Hong Kong Academy of Medicine in Obstetrics and Gynaecology or its equivalent), or trainees (who were undergoing specialist training, with or without postgraduate qualification such as Membership of the Royal College of Obstetricians and Gynaecologists). For laparoscopic surgery, the levels of competence were classified as intermediate and advanced according to the accreditation system for gynaecological laparoscopic surgery established by the Hong Kong College of Obstetricians and Gynaecologists since 1998. Data pertaining to postoperative complications, transfusions, and pathology of the conditions were also collected for analysis. Definitions of complications were clearly stated on the audit form, and categorised akin to those defined by Dicker et al.[4]

Statistical analyses were performed using the Statistical Package for the Social Sciences (Windows version 2000; SPSS Inc, Chicago [IL], United States). All data were analysed according to the intention-to-treat principle, using the Chi squared test if categorical, one-way analysis of variance for uniformly distributed continuous variables, and the Kruskal Wallis Test for non-parametric data.

Results

A total of 1380 audit forms were returned from the 12 hospitals. After exclusion of 39 patients with malignancies, 10 patients with borderline malignancy, and one who had a postpartum hysterectomy, details pertaining to remaining 1330 individuals were analysed. These patients included: 934 (70.2%) having AH, 212 (15.9%) having VH, and 184 (13.8%) having LH. Conversion to laparotomy was required in eight (4.3%) LH and two (0.9%) VH patients.

Information on age was available in all except one patient. Over three quarters of them were aged between 36 and 55 years. The age distribution among different types of hysterectomy is shown in Figure 1. Respective mean±standard deviation (SD) of patient ages for those undergoing AH and LH were similar (47±7 vs 46±9 years), but the ages of those undergoing VH (65±11) were significantly greater (P<0.001). Most patients undergoing AH and LH had no concurrent medical diseases (79% and 78% respectively), while 52% of those having VH had co-morbidities (most commonly coded as hypertension and diabetes mellitus).

Table 1 summarises the indications for different types of hysterectomy. Uterine fibroid was the most common for AH (73.7%) and LH (61.4%), whilst among those having VH, genital prolapse was the reason in

96.2%. Ten patients had emergency hysterectomy (all in the course of AH)—six were performed for adnexal pathology, two for menorrhagia, one for a pelvic abscess, and one for post-myomectomy haemoperitoneum. All AH and VH procedures were total hysterectomies, whereas 20 (10.9%) LH operations were supracervical (preserving the cervix). Prophylactic antibiotics were used in the majority of the patients undergoing VH (86.3%) and LH (84.8%), but only 45.8% of AH (P<0.001).

Table 2 summarises the uterine size and uterine weight among patients undergoing hysterectomy by different routes. Uterine size was significantly larger in those undergoing AH as compared to those having a VH or LH (P<0.001). The majority (88.7%) of VH procedures were performed for patients having a normal- or small-size uterus; only 6.1% were equivalent in size to an 8-week conceptus or larger. Laparoscopic hysterectomy was performed for uterine sizes up to a 16-week conceptus, with only one being equivalent to 18 weeks. Uterine size was larger than a 16-week conceptus in 18.6% of those undergoing AH with 4.1% being equivalent to or greater than a 20-week conceptus. Data on uterine weight were not reported for 380 (28.6%) patients—259 (27.8%) having AH, 59 (32.1%) having LH, and 62 (29.2%) having VH. There was a significant difference in the median uterine weight among the three groups (P<0.001), with the weight being 427 g (interquartile range [IQR], 225-685 g) in the AH group, 248 g (IQR, 154-354 g) in those having LH, and 55 g (IQR, 40-91 g) in those having VH.

The qualifications of the surgeons who performed the hysterectomies (Fig 2) were available for all except one, who was a visiting surgeon that conducted a laparoscopic surgery workshop. The ratio of trainees to qualified specialists were nearly equal for patients having AH or VH; being 49.8% vs 50.2% and 52.4% vs 47.6% respectively. Whereas LH was mostly performed by specialists (92.9%). If the trainee was the chief surgeon, the hysterectomy was supervised by a specialist in 84.1% of AH, 92.8% of VH, and 100% of LH. The operation was performed and assisted by trainees without any postgraduate qualification in 20 (2.1%) patients having AH, two (0.9%) having VH, and none undergoing LH.

For LH, 113 (61.4%) were performed by a surgeon with an advanced level of accreditation for laparoscopic surgery, 54 (29.3%) by one with an intermediate level of competence, and 11 (6.0%) with no accreditation; information was unknown for six operations. For those performed by surgeons with intermediate accreditation, 52 (96.3%) were assisted by specialists, of whom 46 had advanced accreditation, five had intermediate accreditation, and one was without accreditation. Regarding surgeons with no accreditation who performed LH on 11 patients, 10 were assisted by specialists. Among these, eight had advanced accreditation and two had intermediate accreditation. The remaining unaccredited surgeon was assisted by a trainee (with a postgraduate qualification but no accreditation).

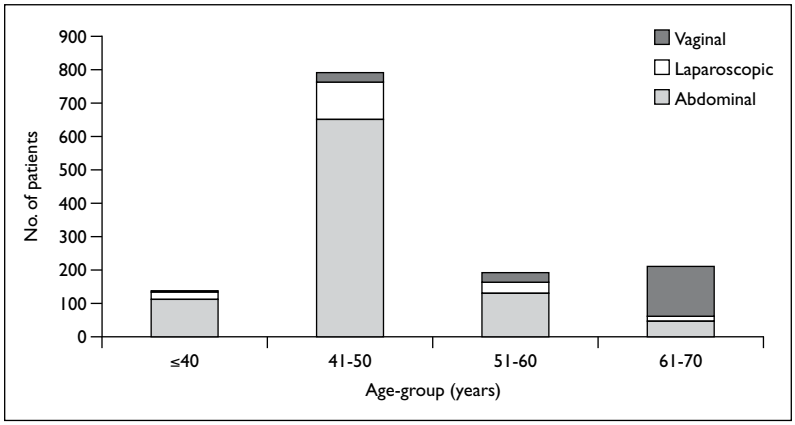

FIG 1. Age distribution among different types of hysterectomy

TABLE 1. Indications of hysterectomy for different types (multiple entries)

Indication	No. (%)		
	Abdominal hysterectomy, n=934	Laparoscopic hysterectomy, n=184	Vaginal hysterectomy, n=212
Fibroid	688 (73.7)	113 (61.4)	7 (3.3)
Menorrhagia	270 (28.9)	82 (44.6)	2 (0.9)
Adnexal pathology	150 (16.1)	14 (7.6)	2 (0.9)
Pelvic endometriosis	50 (5.4)	7 (3.8)	0
Adenomyosis	44 (4.7)	14 (7.6)	0
Endometrial hyperplasia	41 (4.4)	2 (1.1)	2 (0.9)
Cervical intra-epithelial neoplasia	27 (2.9)	11 (6.0)	0
Genital prolapse	4 (0.4)	18 (9.8)	204 (96.2)
Genuine stress incontinence	7 (0.7)	6 (3.3)	21 (9.9)
Cystocele	1 (0.1)	1 (0.5)	13 (6.1)
Others	84 (9.0)	26 (14.1)	4 (1.9)
Suspected malignancy	3 (0.3)	0	1 (0.5)

Concurrent oophorectomy (unilateral/bilateral) was performed significantly less frequently in those having VH as opposed to AH (3.3 vs 59.0%; odds ratio [OR]=0.02; 95% confidence interval [CI], 0.01-0.05) and LH (3.3 vs 42.9%; OR=0.05; 95% CI, 0.02-0.10). The procedure was performed significantly more often in those having AH than LH (OR=1.91; 95% CI, 1.39-2.63). Similarly, prophylactic oophorectomy was undertaken significantly less often in those having VH as opposed to AH (1.4% vs 35.3%; OR=0.04; 95% CI, 0.01-0.13) and LH (26.6%, OR=0.05; 95% CI, 0.02-0.17). However, there was no statistically significant difference in the frequency of prophylactic oophorectomy between patients having AH as opposed to LH (OR=1.33; 95% CI, 0.95-1.86). The procedure was increasingly undertaken with increasing age in both AH and LH patients. For women aged 41 to 45 years having AH and LH, 12.9%

TABLE 2. Uterine sizes/weights, and operating time/blood loss noted with different types of hysterectomy

	No. (%)			
	Abdominal hysterectomy, n=934	Laparoscopic hysterectomy, n=184	Vaginal hysterectomy, n=212	Total, n=1330
Uterine size				
Normal	168 (18.0)	45 (24.5)	188 (88.7)	401 (30.2)
≤12 weeks	289 (30.9)	117 (63.6)	24 (11.3)	430 (32.3)
12-16 weeks	303 (32.4)	21 (11.4)	0	324 (24.4)
>16 weeks	174 (18.6)	1 (0.5)	0	175 (13.2)
Uterine weight				
No. of cases	675	125	150	950
Median (IQR*) [g]	427 (225-685)	248 (154-354)	55 (40-91)	320 (126-567)
Operating time (min)				
Mean±SD	89±36	127±50	88±36	94±40
≤60	230 (24.6%)	7 (3.8%)	55 (25.9%)	292 (22.0%)
61-120	589 (63.1%)	101 (54.9%)	128 (60.4%)	818 (61.5%)
121-180	94 (10.1%)	49 (26.6%)	25 (11.8%)	168 (12.6%)
>180	21 (2.2%)	27 (14.7%)	4 (1.9%)	52 (3.9%)
Blood loss (mL)				
Median (IQR)	320 (200-600)	200 (100-400)†	200 (100-338)	300 (200-500)
Range	5-6600	5-1800	20-3000	5-6600
≤500	683 (73.1%)	163 (89.1%)	194 (91.5%)	1040 (78.3%)
501-1000	181 (19.4%)	16 (8.7%)	14 (6.6%)	211 (15.9%)
1001-2000	56 (6.0%)	4 (2.2%)	3 (1.4%)	63 (4.7%)
>2000	14 (1.5%)	0	1 (0.5%)	15 (1.1%)

* **IQR denotes interquartile range**

† **Data on blood loss were missing in one case of the laparoscopic hysterectomy group**

and 7.4% respectively had the procedure, whereas in women aged 46 years or older, the corresponding figures increased to 55.3% (OR=4.33; 95% CI, 2.98-6.30) and 48.9% (OR=5.25; 95% CI, 1.81-15.27). By the age of 50 years, 92.5% and 88.2% of the patients undergoing AH and LH respectively had bilateral oophorectomies, for indicated or prophylactic reasons. In contrast, despite their older ages, prophylactic oophorectomy was uncommonly performed in patients having VH. As expected, salpingo-oophorectomy was performed more often in patients who had any adnexal pathology (87.3% vs 43.0%; OR=2.03; 95% CI, 1.57-2.63).

The mean±SD of operating times for LH and AH were 127±50 versus 89±36 minutes (P<0.001). The corresponding figures for those having VH were 88±36 minutes, which also resulted in a statistically significant difference in comparison to patients having LH (P<0.001). Operating time was over 180 minutes in 14.7% of those having LH compared to only 2.2% in patients having AH and 1.9% in those having VH. Operative blood loss data were available in all except one patient undergoing LH, and was significantly greater in the AH group (P<0.001), with a median blood loss of 320 mL (IQR, 200-600; range, 5-6600 mL) whilst it was 200 mL in both the LH (IQR, 100-400; range, 5-1800 mL) and VH (IQR, 100-338; range, 20-3000 mL) groups. Blood loss was over 1000 mL in 7.5% in AH patients compared to 2.2% in LH and 1.9% in VH patients (P=0.001) [Table 2].

Operative and postoperative complications are summarised in Table 3. The overall complication rate, defined as the number of women with one or more categorical complications per 100 women, was significantly higher for AH than that for VH (26.4% vs 17.0%, P<0.001); the rate for LH (23.9%) was similar to that for AH. The crude total incidence of complications was lower among patients having VH, than those having either AH (P<0.001) or LH (P<0.05). Irrespective of the route of hysterectomy, the complication rate was not affected by the size of the uterus, the presence of adhesions or endometriosis. The incidence of peri-operative transfusion was lower in VH than LH and AH (P<0.05) patients. Bladder injury occurred with all types of hysterectomy; the risk being doubled after LH compared to AH and VH, although the difference was not statistically significant. Ureteric injury only occurred after AH and LH; the risk being significantly higher after the latter (P<0.01). Overall, the risk of urinary tract injury was significantly higher for LH

than AH patients (OR=4.46; 95% CI, 1.48-13.44) but no significant difference was demonstrated between LH and VH groups (OR=7.11; 95% CI, 0.85-59.63). Only one patient suffered bowel injury, which occurred after AH. Patients having an AH had a significantly higher chance of urinary tract infection, compared to those having an LH (OR=2.49; 95% CI, 1.19-5.22) and VH (OR=1.89; 95% CI, 1.02-3.51). Table 4 shows the incidence of infectious morbidities, defined as the presence of any type of infection-related complication, irrespective of prophylactic antibiotic use. Infectious morbidity was significantly greater in patients undergoing AH without prophylactic antibiotics (OR=2.27; 95% CI, 1.58-3.28).

Irrespective of the type of hysterectomy, there was no difference in the complication rates for procedures performed by specialists and by trainees. There was also no difference in the complication rates between LH procedures performed by surgeons with or without advanced level accreditation. Regarding the 113 LHs performed by advanced-level accredited surgeons, 88 (77.9%) were uncomplicated. Correspondingly 38 (70.4%) of the 54 LHs performed by intermediate level accredited surgeons and eight (72.7%) of the 11 procedures performed by surgeons with no accreditation were uncomplicated.

There were five unintended early re-laparotomies among AH patients, all due to major immediate postoperative complications (four haemorrhages and one burst abdomen). There was another late re-laparotomy for repair of an intestine-cutaneous fistula after AH. Laparoscopic hysterectomy was also associated with four delayed re-laparotomies for repair of ureteric injury. The overall unintended major re-operation rates for AH and LH were 0.6% and 1.1% respectively.

The mean±SD duration of postoperative hospital stay for those having an AH was 6.7±2.5 days, which was significantly longer than for those having an LH (4.2±3.4 days, P<0.001) or a VH (4.9±2.4 days, P<0.001).

Discussion

This 6-month audit exercise covered only those hysterectomies performed in gynaecological units of hospitals under the Hospital Authority. Extrapolating from findings of the previous territory-wide audit conducted by the Hong Kong College of Obstetricians and Gynaecologists, they probably represent two thirds of all hysterectomies performed in the territory during that period; assuming one third were performed in private hospitals.[2]

In this audit the proportion having VH was higher than that reported in the territory-wide audit report in 1999 (16.0% vs 10.9%); but lower than in the United Kingdom (30.0%).[3] The discrepancy between our figure and that from the United Kingdom is excessive, not withstanding differences in uptake rates for LH over recent years. Many studies in the literature indicate that VH is

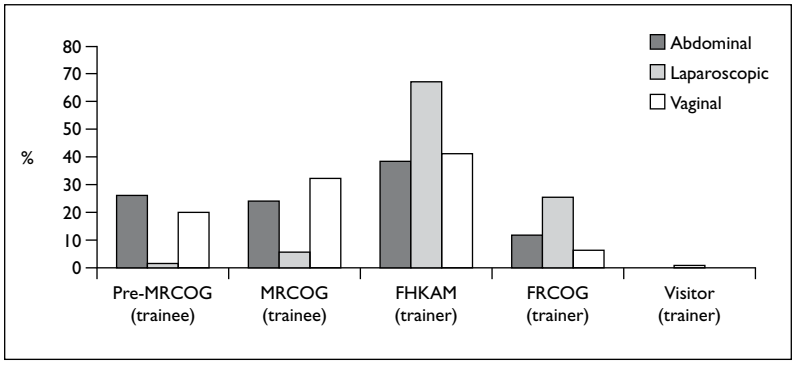

FIG 2. The qualification of chief surgeon who performed the hysterectomy*

* FHKAM denotes Follow of the Hong Kong Academy of Medicine (Obstetrics and Gynaecology), and FRCOG Fellow of Royal College of Obstetricians and Gynaecology

TABLE 3. Complications noted with different types of hysterectomy (multiple entries)

Complications	No. (%)		
	Abdominal hysterectomy (AH), n=934	Laparoscopic hysterectomy (LH), n=184	Vaginal hysterectomy (VH), n=212
Febrile morbidity*			
Unidentified cause	48 (5.1)	6 (3.3)	5 (2.4)
Urinary tract infection	95 (10.2)†	8 (3.8)	12 (5.7)
Pelvic/vault haematoma	53 (5.7)	12 (6.5)	8 (3.8)
Wound infection	25 (2.7)	1 (0.5)	0
Haemorrhage requiring transfusion	40 (4.3)	2 (1.1)	1 (0.5)‡
Unintended major re-operation			
Re-laparotomy	5 (0.5)	0	0
Re-operation for bladder injury	5 (0.5)	2 (1.1)	1 (0.5)
Re-operation for ureteric injury	2 (0.2)	4 (2.2)§	0
Re-operation for bowel injury	1 (0.1)	0	0
Others			
Urinary retention	7 (0.7)	1 (0.5)	4 (1.9)
Vault haemorrhage	4 (0.4)	3 (1.6)	1 (0.5)
Subcutaneous haemorrhage	3 (0.3)	0	0
Significant emphysema	N/A	1 (0.5)	N/A
Deep vein thrombosis	1 (0.1)	1 (0.5)	1 (0.5)
Other wound problems	4 (0.4)	0	0
Others	7 (0.7)	4 (1.1)	2 (0.5)
Re-admission	10 (1.1)	9 (3.8)	3 (1.4)
Crude total	310 (33.2)‖	62 (33.7)¶	40 (18.9)
One or more categorical complications	287 (26.4)‖	44 (23.9)	36 (17.0)

* **Fever >38°C on two occasions 4 hours apart excluding the first 24 hours**
† **P<0.05, vs LH**
‡ **P<0.05, vs AH**
§ **P<0.01, vs AH or VH**
‖ **P<0.001, vs VH**
¶ **P<0.05, vs VH**

TABLE 4. Infectious morbidities in patients with and without prophylactic antibiotics among different types of hysterectomy

Type of hysterectomy	With prophylactic antibiotics*	Without prophylactic antibiotics
Abdominal (n=932)	45/427 (10.5%)	121/505 (24.0%)†
Laparoscopic (n=184)	14/156 (9.0%)	2/28 (7.1%)
Vaginal (n=210)	14/184 (7.6%)	4/27 (14.8%)
Overall	**73/767 (9.5%)**	**127/560 (22.7%)†**

* **Information on the use of prophylactic antibiotics was missing in 2 abdominal and 1 vaginal hysterectomies**

† **P<0.001**

associated with a decreased incidence of complications, shorter hospital stay and convalescence, reduced hospital charges, better quality-of-life outcomes, and decreased mortality.[4-10] Findings from our audit also revealed that the overall incidence of complications was lower for patients having VH, rather than AH and LH. However, this could be due to difference in pathology apart from the surgical approach; most AH and LH procedures being performed for fibroids, while VH was only for prolapse. The two conditions are not comparable—the former operation could be more difficult owing to co-existing pathology like endometriosis and pelvic adhesions. To get a better understanding, comparison of the procedures is needed in the presence of similar pathology. Be that as it may, AH continues to be the operation favoured by many gynaecologists, although it is now acknowledged to be preferable only when there is a serious underlying pathological condition. For less serious diseases, the vaginal route is appropriate. A study evaluating guidelines for determining the route of hysterectomy showed that implementation of practice guidelines reduced the ratio of AH to VH procedures from 3:1 to 1:11.[11]

From our data, if VH was to be performed in patients with a mobile disease–free uterus and size equivalent to 12 weeks of gestation or smaller, 270 other patients could have undergone VH instead of AH. Moreover, if patients with intra-operative adhesions were not excluded, a further 190 VH operations could have been performed, increasing the proportion of such hysterectomies to 28.1%.

The incidences of peri-operative complications after all types of hysterectomy were much higher in our audit than reported from the territory-wide audit in 1999 (AH 7.58%, LH 10.3%, VH 8.2%).[2] This was very likely due to underreporting of less severe complications in the old territory-wide audit, which collected data from all routine gynaecological admissions. It did not entail a specifically designed audit tool to investigate hysterectomy. Indeed, routinely collected administrative data have been shown to have limitations with respect to risk adjustment for the complications of hysterectomy.[12] Nevertheless, the incidences of major visceral damages reported in the current study were similar to findings reported in the literature and various international databases.[13] The risk of urinary tract injury was significantly higher after LH than AH. However there was no such difference demonstrable in patients having LH versus VH (probably due to the small sample size). A recently published systematic review concluded that VH should be preferred over AH whenever possible, because of significantly better outcomes.[13] Where VH is not possible, LH may avoid the need for AH. The benefits of LH versus AH were: less intra-operative blood loss and drop in haemoglobin level, shorter hospital stays, speedier return to normal activities, fewer wound or abdominal wall infections, fewer unspecified infections and febrile episodes, but at a cost of longer operating times and more urinary tract (bladder or ureter) injuries. It was therefore suggested that after discussion with his/her surgeon, the approach to hysterectomy should be decided by the patient himself/herself in light of the above-mentioned benefits and hazards.[13]

As shown in this audit, the level of supervision for local trainees was high, even compared with that in the United Kingdom.[3] In the VALUE national hysterectomy study,[3] of the hysterectomies attributed to non-consultants, 34% were supervised. In our audit, most AH and VH procedures performed by our trainees were supervised, while for LH, they were assisted by specialists.

Antibiotic prophylaxis for hysterectomy has been extensively studied and believed to more than halve the rate of postoperative infections, which otherwise affected about 40 to 50% of women having a VH and more than 20% having an AH. The practice is now recommended in national guidelines for all types of hysterectomy,[14] but this audit showed it was by no means applied to all patients. Notably, our patients undergoing AH without chemoprophylaxis manifested a significantly higher incidence of infectious morbidity.

Conclusion

The overall incidence of complications was lower after VH, than both AH and LH. Our incidences of major visceral damage were similar to those reported in the literature and in international databases. The risk of urinary tract injury was significantly higher for patients having LH rather than AH. The level of supervision for the trainees as shown in this audit was high. However, more training is required to improve uptake of the vaginal approach and routine antibiotic chemoprophylaxis should be used irrespective of the type of hysterectomy.

Acknowledgements

The authors would like to thank members of the Quality Assurance (O&G) Subcommittee of the Hospital Authority of Hong Kong for their support and the following hospitals in their participation in the audit exercise: Alice Ho Miu Ling Nethersole Hospital, Caritas Medical Centre,

Kwong Wah Hospital, Our Lady of Maryknoll Hospital, Pamela Youde Nethersole Eastern Hospital, Prince of Wales Hospital, Princess Margaret Hospital, Queen Elizabeth Hospital, Queen Mary Hospital, Tseung Kwan O Hospital, Tuen Mun Hospital, and United Christian Hospital.

References

1. Territory-wide audit in Obstetrics and Gynaecology, Hong Kong 1994. Hong Kong: Hong Kong College of Obstetricians and Gynaecologists; 1994.
2. Territory-wide audit in Obstetrics and Gynaecology, Hong Kong 1999. Hong Kong: Hong Kong College of Obstetricians and Gynaecologists; 1999.
3. Maresh MJ, Metcalfe MA, McPherson K, et al. The VALUE national hysterectomy study: description of the patients and their surgery. BJOG 2002;109:302-12.
4. Dicker RC, Greenspan JR, Strauss LT, et al. Complications of abdominal and vaginal hysterectomy among women of reproductive age in the United States. The Collaborative Review of Sterilization. Am J Obstet Gynecol 1982;144:841-8.
5. Wingo PA, Huezo CM, Rubin GL, Ory HW, Peterson HB. The mortality risk associated with hysterectomy. Am J Obstet Gynecol 1985;152:803-8.
6. Kovac SR. Guidelines to determine the route of hysterectomy. Obstet Gynecol 1995;85:18-23.
7. Dorsey JH, Steinberg EP, Holtz PM. Clinical indications for hysterectomy route: patient characteristics or physician preference? Am J Obstet Gynecol 1995;173:1452-60.
8. van den Eeden SK, Glasser M, Mathias SD, Colwell HH, Pasta DJ, Kunz K. Quality of life, health care utilization, and costs among women undergoing hysterectomy in a managed-care setting. Am J Obstet Gynecol 1998;178:91-100.
9. Summitt RL Jr, Stovall TG, Steege JF, Lipscomb GH. A multicenter randomized comparison of laparoscopically assisted vaginal hysterectomy and abdominal hysterectomy in abdominal hysterectomy candidates. Obstet Gynecol 1998;92:321-6.
10. Kovac SR. Hysterectomy outcomes in patients with similar indications. Obstet Gynecol 2000;95:787-93.
11. Kovac SR, Barhan S, Lister M, Tucker L, Bishop M, Das A. Guidelines for the selection of the route of hysterectomy: application in a resident clinic population. Am J Obstet Gynecol 2002;187:1521-7.
12. Myers ER, Steege JF. Risk adjustment for complications of hysterectomy: limitations of routinely collected administrative data. Am J Obstet Gynecol 1999;181:567-75.
13. Johnson N, Barlow D, Lethaby A, Tevendar E, Curr L, Garry R. Surgical approach to hysterectomy for benign gynaecological disease. Cochrane Database Syst Rev 2006;2.
14. Marjoribanks J, Jordan V, Calis K. Antibiotic prophylaxis for elective hysterectomy. (Protocol) Cochrane Database Syst Rev 2004, Issue 1. Art. No.: CD004637. DOI: 10.1002/14651858.CD004637.