Title Page

"The characteristics of women recommended a laparoscopy for chronic pelvic pain at a tertiary institution"

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ABSTRACT

Background: Clinician and patient factors impact on the management of chronic pelvic pain (CPP) with medical, surgical or combined approaches possible, though none have proven superior.

Aims: To understand the characteristics of women offered laparoscopic pelvic surgery for CPP.

Materials and methods: We performed an observational study of women referred with CPP. They were asked to complete a study questionnaire regarding their symptoms, medical history, quality of life and pain catastrophisation. Examination

and ultrasound findings were collected from patient records.
Gynaecologists who recommended a laparoscopy completed a survey detailing their reasoning at the time of booking.
The outcomes were investigated using a Cox proportional hazard model.

Results: Of 211 participants, 59 (28%) were booked for laparoscopic surgery during the study timeframe. Factors increasing the rate of laparoscopy included severe dysmenorrhoea(Cox HR=1.94; P=0.017), unsuccessful trial of hormonal therapy(Cox HR=1.81; P=0.044), prior abdominal surgery(Cox HR=1.79; P=0.030), prior pelvic laparoscopy(Cox HR=2.00; P=0.007) and past diagnosis of endometriosis(Cox HR=5.44; P=0.010). Abnormal vaginal examination(Cox HR=2.86; P=0.019) and ultrasound probe tenderness(Cox HR=2.52; P<0.001) also increased the likelihood of surgery. Surgical and non-surgical patients did not differ in family history, quality of life or pain catastrophisation.
Of gynaecologists questionnaires, 75% were returned. Results indicated they were most influenced by the severity or duration of pain and least by examination or ultrasound findings.

Conclusions: The characteristics of women booked for surgery were in keeping with the features evidence suggests increases the risk of pathology. There were some discrepancies between patient characteristics elicited in the questionnaires and those indicated by gynaecologists to influence their decision.

INTRODUCTION

Chronic pelvic pain (CPP) is estimated to affect 1 in 5 Australian women, severely impacting on their physical and psychological health, as well as their quality of life (QOL)(1, 2). Despite its prevalence, CPP remains under researched with pathways for optimal care poorly defined. Affected women frequently have their symptoms disregarded or perceived negatively by health professionals(3, 4). This results in years of inaccurate diagnosis and poor management (5).

Medical or surgical approaches, neither of which has proved superior, are the mainstays of treatment and are often used in combination. Medical therapies decrease nociception, suppress menstruation and, in the case of endometriosis prevent the development of new lesions while decreasing the size of existing lesions (6, 7). Formal indications for laparoscopy in pelvic pain, as defined by the Royal College of Obstetricians and Gynaecologists, include situations where “the index of suspicion of adhesive disease or endometriosis requiring surgical intervention is high” or “when the patient has specific concerns which could be addressed by diagnostic laparoscopy such as the existence of endometriosis or adhesions potentially affecting her fertility”(8).

However, there remains discordance and contradiction in the literature as to which patient characteristics, if any, increase the possibility of pathology being found at surgery. Furthermore, it is not known which elements of the literature clinicians incorporate into their practice.

Thus the primary aim of this study was to compare the characteristics of CPP women who were and were not booked for a pelvic laparoscopy, including a time-to-event (decision to operate) approach with censoring at 18 months. Regarding patients booked for surgery, a second aim was to identify why gynaecologists made the decision to proceed with an operative intervention.

In doing so, we hope to further understand and facilitate discussion regarding the place of laparoscopic surgery in CPP patients.

MATERIALS AND METHODS

A prospective, observational study was conducted of CPP patients, with retrospective review of their medical records including outpatient notes and operation reports. A prospectively collected survey was also conducted on gynaecologists who booked patients for surgery.

Recruitment

All referrals to the gynecological outpatient department at The Mercy Hospital for Women between February and December 2015 were reviewed to identify women 18 to 50 years of age presenting with CPP.

Patients who were recognised as potential study participants on the basis of their referral letter were sent a participant information pack consisting of a plain language statement, consent form, study questionnaire and return envelope. Women who failed to return their forms via mail were approached while in the waiting room, prior to their first outpatient appointment and were once more invited to participate.

If informed consent was obtained, review of the completed study questionnaire and the outpatient notes took place following her first appointment. If the patient

conformed to the inclusion and exclusion criteria, the woman was considered part of the study.

To meet the inclusion criteria, patients had to be; aged 18 years or more, premenopausal and experiencing symptoms of pelvic pain, lasting longer than six months. Women were excluded if they had an absolute contraindication to hormonal therapy (HT), if they were seeking pregnancy or treatment for infertility, or if they had undergone a hysterectomy.

Patient questionnaire

A case-report form was designed specifically for this study and was not available to clinicians. The questionnaire included demographic information, symptomatology, previous medical history and family history. The Pain Catastrophising Scale (PCS) and World Health Organisation Quality of Life-Bref (WHOQoL-Bref) questionnaire were also incorporated.

Pain was assessed across five symptoms: dysmenorrhea, pelvic pain, dyspareunia, dyschezia and dysuria. For each symptom patients were asked to specify the worst level of pain experienced over the last 3 months using a 6-point Likert scale, with 0 being no pain and 5 being extreme pain. For the purpose of this study, pain levels were dichotomized with levels 4 and 5 defined as 'severe'. Overall satisfaction with pain control was assessed in a similar manner. Duration of pain was trichotomised into three groups: 6 months to 2 years, 2 years to 5 years and 5 years or more. Age at symptom onset was recorded in ten-year increments between the ages of 10 and 49 years.

Urinary symptoms investigated included nocturia, urgency and frequency. Nocturia was defined according to International Continence Society standardised terminology as the need to urinate two or more times during the night(9). Urinary urgency was recorded if the patient experienced the need to rush to the toilet "most of the time" or "all of the time" and not if they reported "never", "occasionally" or "sometimes". For the purposes of our study, we defined frequency of urination as the need to pass urine every 1 to 2 hours.

General menstrual history included age at menarche, regularity and length of cycles. Given the difficulty in accurately assessing heavy menstrual bleeding (HMB) four questions were asked to ensure the condition was not overlooked. They included patient-reported HMB and the regular occurrence of accidents or flooding. Both questions were designed to elicit the condition as defined by the International Federation of Gynaecology and Obstetrics (FIGO) who stipulate HMB cannot be determined unless the excess menstrual loss interferes with a woman's QOL(10). To obtain an objective measure of flow, patients were asked to detail the frequency of sanitary protection changes, with changes less than 2 hourly considered abnormal. Finally, patients were asked to record the average number of bleeding days per cycle. In line with FIGO guidelines, 8 or more days was defined as prolonged menstrual bleeding(10).

Current medical treatments, previous medical treatments, past surgery, past obstetric history and family history were recorded using tick box and free hand answers.

The PCS, also included in the questionnaire, was designed to examine a patients "negative mental set brought to bear during actual or anticipated painful experience"(11). A score of greater than 30 is defined as clinically significant(12).

Finally, patients were asked to complete the WHOQoL-Bref survey, a validated method for determining QOL(13).

Gynaecologists survey

Immediately following the conclusion of a womans' outpatient appointment her gynaecologist was asked if they intended to book the patient for a pelvic laparoscopy. If they answered in the affirmative they were immediately presented with a survey inquiring about which variables, if any, impacted on their decision to operate. Gynaecologists were able to select more than one option and add in other reasons not included in the form or, decline to complete the survey.

Retrospective review of patient records

Examination findings were recorded by retrospectively reviewing the documentation in the participant medical records, following their outpatient consultation. A normal

examination was considered one in which pain was not elicited and where no pathology was found. An abnormal vaginal examination was determined when the patient experienced pain or when the clinician identified decreased pelvic organ movement or palpable endometriotic nodules.

Ultrasound (US) results were also collected from patient records. An US was considered 'normal' if it did not identify pain-causing pathology nor decreased mobility or tenderness of pelvic organs.

Surgery

Patients were identified as having been booked for surgery if they were formally scheduled for a pelvic laparoscopy. Patient characteristics measured included a time-to-decision to operate with a follow up period of 6 to 18 months.

Evidence of pathology found at surgery was obtained from operative notes and when biopsies had been taken, confirmed by reviewing the histopathology reports.

Data Analysis

All statistical tests were performed using SPSS version 13 (SPSS, Inc. Chicago, IL) with statistical significance defined as a P value ≤ 0.05. No explicit correction for multiple testing was performed due to the exploratory nature of this study.
The association between patient characteristics and outcomes (booked or not booked for surgery) were investigated using univariant Cox proportional hazard models. The results were summarised using hazard ratios (HR) with corresponding 95% confidence intervals (CI). Figures were created using Prism 7.0 GraphPad software (La Jolla, CA, USA).

Ethics

Approval for this study was obtained from the Mercy Hospital for Women human research ethics committee (Ethics ID: R14/31).

RESULTS

Three-hundred and six new referrals were identified as potential study participants and sent a study pack. Of these, 211 patients were recruited with 59 (28%) booked for laparoscopic surgery. Five of these patients were booked for surgery at their first outpatient appointment and the remainder at a subsequent visit. The median number of months to booking surgery was 4 (IQR: 0-7) and the median number of months to surgery from the initial outpatient appointment was 5 (IQR: 3-7). The median age for women booked for laparoscopy was 29 (IQR: 24-35) and 28 (IQR: 23-37) for women who were not booked.

Patient characteristics

The presentation of women booked for surgery was associated with age (20-29 years), severe dysmenorrhoea, failed trial of hormonal treatment, a previous diagnosis of endometriosis and previous abdominal or pelvic surgery. Figure 1 summarises these results.

Figure 1: Summary of significant findings

An abnormal vaginal examination, as well as ultrasound findings of tenderness to probe and deep infiltrating endometriosis (DIE) was also more common among these women.

Women with a normal physical examination were less likely to be booked for surgery.

Table 1 details these results.

Gynecologists' Survey

Forty-four of 59 (75%) questionnaires were returned. Severity and the duration of pain, as well as failed trial of HT, were among the most cited indications for booking surgery. Less common reasons included examination findings, and a family history of endometriosis. These results are described further in Table 2.

Surgical findings

Forty-two out of 59 patients (71%) booked for laparoscopy underwent the procedure at our institution. In 26 of these cases endometriosis was visually diagnosed, with severity ranging from minimal to mild according to the revised American Fertility Society (rAFS) classification. There were no cases of moderate or severe endometriosis. Of the 21 samples of suspected endometriosis sent for histological confirmation, 18 were confirmed. This corresponds to a prevalence rate of 39% for histologically proven endometriosis in women with CPP undergoing laparoscopy. The surgical findings are summarised in Figure 2.

DISCUSSION

Our study demonstrates differences in the characteristics of women with CPP for whom a pelvic laparoscopy was and was not booked with the variable of time controlled for using a survival analysis to reduce bias. The characteristics of women elicited from our patient questionnaire differed somewhat to the variables identified by gynaecologists as influencing their decision to operate.

Chronic pelvic pain is a diagnostic and management dilemma, with over 70 possible aetiologies spread across multiple organ systems.

In patients where the cause is thought to be specific to the female reproductive system, surgery offers a chance of a definitive diagnosis, some prognostic information, particularly with regard to future fecundity(14) and, in some cases, immediate treatment. It is also associated with greater mortality and cost when compared with medical management(8, 15) and should thus be reserved for women suspected of having a physical pathology, such as, endometriosis or adhesions(8). Unfortunately identifying these women remains difficult, ultimately relying on clinician's gestalt, which combines history, examination and investigative findings.

In our study, severe dysmenorrhoea was the only symptom to impact on the likelihood of surgery and is also the symptom with the best associative evidence for

endometriosis(16, 17). The presence of non-cyclic pelvic pain did not influence clinician decision-making, despite evidence suggesting an association between both endometriosis and adhesions(16, 18, 19). Similarly, prolonged menstruation, which has been found to double the risk of endometriosis in two studies, had no influence on the likelihood of surgery(20, 21).

In contravention to a recent study demonstrating histologically-proven endometriosis could not be predicted by the effectiveness or ineffectiveness of HT(22), unsuccessful trial of HT resulted in more women being booked for surgery. However, given the complex nature of CPP, it is too simplistic to state that failed HT always negates the need for surgery.

A previous diagnosis of endometriosis was the variable most likely to increase the probability of surgery, however, only 20% of clinicians cited this as contributing to their decision to operate. Of interest, Jarrell et al found the only predictor of time to second laparoscopy, in women with a previous diagnosis of endometriosis, was the severity of pain prior to the first surgery and not the stage of endometriosis(23).

Of the women in our study who had been diagnosed with endometriosis at a previous surgery and went on to have another pelvic laparoscopy during our follow up period (n=18), 7 were found to have recurrence of the disease. No patient with a previously endometriosis-negative laparoscopy (n=11) was subsequently found to have disease. As endometriosis is a dynamic condition, with spontaneously progressive and regressive properties(24), a past diagnosis of endometriosis may not be seen as a singular reason for surgery, even when the patients' symptoms have returned. Similarly a previously negative laparoscopy may negate the need for repeat operations.

Past abdominal surgery, along with past pelvic laparoscopy, was significantly associated with an increased risk of further surgery. Specifically regarding past pelvic laparoscopy, it is unclear whether the association reflects clinician concern that endometriosis was; initially overlooked, incompletely excised, had returned, or that adhesion formation had occurred as a consequence of the surgery. Concerning the later, in our study sample, the rate of adhesions among women who had a previous

operation of any kind was 42% compared with 38% with those who had never had surgery. Previous studies have indicated that the frequency of peritoneal adhesions in patients with no prior surgery is approximately 10%(25). Our significantly higher figure is likely because the majority of these cases had concomitant endometriosis. The number of patients with no prior surgical history and no endometriosis was two (9%).

A physical examination was documented as having been performed in approximately half of patients (56% of those booked for surgery and 65% of those not booked). There were a number of stated reasons for this paucity, the most common being current menstruation, recent examination by the patient's primary care physician and patient refusal. It is also possible the decision to book or not book surgery was made based on the history alone, with the clinician feeling an examination would not alter management decision and only add to the woman's discomfort. It is also possible clinicians felt information obtained from ultrasound adequately informed the likelihood of identifying clinically significant findings.
Ultimately, it is a surprising and disappointing finding, especially given that an abnormal clinical examination, in the setting of CPP, has been reported to increase the chance of endometriosis being discovered at surgery by 70-90%(26, 27).

An emerging area of research into CPP is that exploring the influence of pain sensitisation. Given this, we also reviewed records to see if clinician's investigated for this as part of their clinical workup. Unfortunately we found it was seldom considered, despite evidence suggesting central sensitisation may influence the effects of treatment including surgery(28).

Imaging modalities such as US and magnetic resonance have proven superior to physical examination with regards to sensitivity, specificity, negative and positive predictive value(29). In our study, ninety-five percent of patients booked for laparoscopic surgery had a documented US investigation compared with 80% of those who were not recommended surgery. The majority of US were performed transvaginally (95%) with fewer performed transabdominally (5%). Site-specific

tenderness showed a definite increase in the likelihood of surgery while decreased adnexal motion moved towards significance. In a study of 120 consecutive women, the presence of these 'soft markers' was associated with a 90% increased likelihood of pathology found at surgery, compared with a normal US decreasing the likelihood by 82%(30).

As indicated by our survey, a patient's anxiety and need for reassurance was a factor contributing to the clinicians' decision to operate. Indeed patients who have a laparoscopy negative for pathology still find some short term pain relief and improvement in their QOL(31).

This study is part of the larger "Persistent Pelvic Pain Study" which investigates the factors influencing the outcomes in women presenting with persistent pelvic pain.

Limitations

Our study was performed at a single centre with a relatively short duration of follow up. There may be some selection bias in our results given not all patients were examined, underwent US imaging and not all gynaecologists completed surveys. Furthermore, gynaecologists only completed surveys on patients booked for surgery, preventing comparison with those who were not.

Our study did not contain any women who had moderate or severe rAFS classifications of endometriosis. This is likely secondary to the small number of study participants who underwent surgery, the even smaller number who had histologically proven endometriosis and the likelihood many of the women were concurrently taking HT. In addition, the score was calculated retrospectively based on operative reports, which poorly recorded the details of adhesive disease and may have under represented the extent of endometrial disease.

Being an exploratory study, each association was tested for individually, with none corrected for multiplicity.

Conclusion

The characteristics of women booked for surgery, according to our patient questionnaire, were in keeping with those the literature suggests are more likely to

have pathology, especially endometriosis. However, the patient factors that gynaecologists believe influenced their decision did not necessarily correlate with the characteristics revealed in our patient survey and, in some cases did not reflect the current evidence base.

Further studies are needed to identify and assess appropriate clinical decision making for CPP, and may aid in the development of guidelines for its investigative algorithm.

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TABLES

Table 1: The relationship of patient characteristics, examination and ultrasound findings with booking for laparoscopy				
Characteristics	**Number of subjects and frequency %**		**HR (95% CI)**	***P*Value**
	Not booked for laparoscopy	Booked for laparoscopy		
Patient characteristics				
Age at Symptom Onset				
10-19 years	70 (74.5)	24 (25.5)	1	-
20-29 years	31 (57.4)	23 (42.6)	1.79 (1.01-3.18)	**0.046**
30-39 years	32 (86.5)	5 (13.5)	0.48 (0.18-1.26)	0.138
40-49 years	4 (80.0)	1 (20.0)	0.86 (0.12-6.36)	0.883
Duration of Symptoms				
6 months to 2 years	9 (81.8)	2 (18.2)	1	-
2 years to 5 years	10 (55.6)	8 (44.4)	3.07 (0.65-14.54)	0.158
5 years or more	37 (68.5)	17 (31.5)	1.91 (0.44-8.30)	0.387
Pain Symptoms				
Severe dysmenorrhoea				
Not present	73 (80.2)	18 (19.8)		
Present	79 (65.8)	41 (34.2)	1.94 (1.11-3.37)	**0.020**
Severe pelvic pain				
Not present	80 (76.2)	25 (23.8)		
Present	72 (67.9)	34 (32.1)	1.41 (0.84-2.37)	0.190
Severe dyspareunia				
Not present	116 (75.3)	38 (24.7)		
Present	36 (63.2)	21 (36.8)	1.60 (0.94-2.72)	0.086
Severe dyschezia				
Not present	119 (74.8)	40 (25.2)		
Present	33 (63.5)	19 (36.5)	1.55 (0.90-2.67)	0.118
Severe dysuria				
Not present	134 (73.2)	49 (26.8)		
Present	18 (64.3)	10 (35.7)	1.38 (0.70-2.72)	0.356
Satisfaction with pain control				
No	131 (71.6)	52 (28.4)		
Yes	21 (75.0)	7 (25.0)	0.84 (0.38-1.84)	0.658
Heavy Menstrual Bleeding				
Patient Reported				
Not present	53 (72.6)	20 (27.4)		
Present	89 (74.2)	31 (25.8)	0.95 (0.54-1.67)	0.864
Sanitary change <2 hourly				
Not present	73 (73.0)	27 (27.0)		
Present	73 (73.0)	27 (27.0)	0.99 (0.58-1.69)	0.980

Flooding				
Not present	50 (67.6)	24 (32.4)		
Present	93 (77.5)	27 (22.5)	0.68 (0.39-1.18)	0.171
Prolonged bleeding				
Not present	130 (73.4)	47 (26.6)		
Present	22 (64.7)	12 (35.3)	1.39 (0.74-2.63)	0.306
Gastrointestinal Symptoms				
Constipation				
Not present	85 (69.7)	37 (30.3)		
Present	67 (75.3)	22 (24.7)	0.82 (0.48-1.38)	0.452
Haematochezia				
Not present	141 (71.9)	55 (28.1)		
Present	11 (73.3)	4 (26.7)	0.97 (0.35-2.97)	0.949
Bowel Upset				
Not present	55 (67.9)	26 (32.1)		
Present	97 (74.6)	33 (25.4)	0.79 (0.48-1.33)	0.380
Urinary Symptoms				
Nocturia				
Not present	102 (71.3)	41 (28.7)		
Present	49 (73.1)	18 (26.9)	0.89 (0.51-1.55)	0.686
Frequency				
Not present	88 (58.3)	63 (41.7)		
Present	39 (66.1)	20 (33.9)	0.74 (0.43-1.27)	0.276
Urgency				
Not present	117 (70.1)	50 (29.9)		
Present	34 (79.1)	9 (20.9)	0.63 (0.31-1.28)	0.201
Other Symptoms				
Mood changes				
Not present	39 (70.9)	16 (29.1)		
Present	114 (72.6)	43 (27.4)	0.96 (0.54-1.70)	0.887
Medical Treatments for CPP				
Current medical treatment				
No	61 (78.2)	17 (21.8)		
Yes	91 (68.4)	42 (31.6)	1.49 (0.85-2.62)	0.166
Previous medical treatment				
No	63 (79.7)	16 (20.3)		
Yes	89 (67.4)	43 (32.6)	1.69 (0.95-3.00)	0.073
Failed hormonal treatment				
No	62 (80.5)	15 (19.5)		
Yes	90 (67.2)	44 (32.8)	1.81 (1.01-3.25)	**0.048**
Surgical History				
Past abdominal surgery				
No	83 (78.3)	23 (21.7)		
Yes	57 (63.3)	33 (36.7)	1.79 (1.05-3.05)	**0.032**

Past pelvic laparoscopy				
No	112 (77.8)	32 (22.2)		
Yes	40 (59.7)	27 (40.3)	2.00 (1.20-3.33)	**0.008**
Previous endometriosis				
No	15 (88.2)	2 (11.8)		
Yes	25 (50.0)	25 (50.0)	5.44 (1.29-23.02)	**0.021**
Obstetric History				
Previous infertility				
No	139 (72.8)	52 (27.2)		
Yes	13 (65.0)	7 (35.0)	1.28 (0.58-2.81)	0.547
Previous miscarriage				
No	103 (73.0)	38 (27.0)		
Yes	40 (67.8)	19 (32.2)	1.29 (0.74-2.24)	0.367
Previous pregnancy				
No	75 (75.0)	25 (25.0)		
Yes	68 (68.0)	32 (32.0)	1.34 (0.79-.2.26)	0.274
Previous vaginal delivery				
No	93 (68.9)	42 (31.1)		
Yes	50 (76.9)	15 (23.1)	0.70 (0.39-1.26)	0.233
Previous caesarean section				
No	123 (71.9)	48 (28.1)		
Yes	20 (69.0)	9 (31.0)	1.09 (0.53-2.22)	0.817
Desire for more children				
No	66 (68.7)	30 (31.3)		
Yes	63 (75.9)	20 (24.1)	0.73 (0.41-1.28)	0.265
Family History				
Pelvic Pain				
No	44 (74.6)	15 (25.4)		
Yes	94 (71.8)	37 (28.2)	1.13 (0.62-2.05)	0.696
Endometriosis				
No	90 (76.9)	27 (23.1)		
Yes	49 (65.3)	26 (34.7)	1.62 (0.94-2.78)	0.081
Heavy menstrual bleeding				
No	60 (75.9)	19 (24.1)		
Yes	78 (70.3)	33 (29.7)	1.29 (0.73-2.27)	0.380
Examination Findings				
General				
Normal examination				
No	42 (64.6)	23 (35.4)		
Yes	52 (83.9)	10 (16.1)	0.44 (0.21-0.92)	**0.030**
Abdominal tenderness				
No	46 (78.0)	13 (22.0)		
Yes	24 (75.0)	8 (25.0)	1.07 (0.44-2.59)	0.880
Vaginal Examination				

Abnormal vaginal examination				
No	33 (84.6)	6 (15.4)		
Yes	28 (58.3)	20 (41.7)	2.86 (1.15-7.12)	**0.024**
Deep tenderness				
No	1 (33.3)	2 (66.7)		
Yes	8 (61.5)	5 (38.5)	0.50 (0.10-2.58)	0.406
Uterine motion tenderness				
No	29 (67.4)	14 (32.6)		
Yes	4 (66.7)	2 (33.3)	0.72 (0.16-3.20)	0.665
Adnexal tenderness				
No	33 (82.5)	7 (17.5)		
Yes	13 (54.2)	11 (45.8)	2.87 (1.11-7.42)	**0.030**
Ultrasound Findings				
General				
Ultrasound findings				
Normal	64 (75.3)	21 (24.7)		
Abnormal	58 (62.4)	35 (37.6)	0.61 (0.36-1.10)	0.075
Uterine position				
Anteverted	84 (64.6)	46 (35.4)		
Retroverted	19 (76.0)	6 (24.0)	0.67 (0.34-1.32)	0.242
Fluid in POD or adnexae				
Not present	101 (66.9)	50 (33.1)		
Present	21 (77.8)	6 (22.2)	0.67 (0.29-1.56)	0.347
Endometriosis				
Endometrioma				
Not present	117 (70.5)	49 (29.5)		
Present	5 (41.7)	7 (58.3)	2.13 (0.96-4.70)	0.062
Low echogenic foci				
Not present	119 (69.6)	52 (30.4)		
Present	3 (42.9)	4 (57.1)	1.83 (0.66-5.10)	0.244
Deep infiltrating endometriosis				
Not present	121 (69.9)	52 (30.1)		
Present	1 (20.0)	4 (80.0)	2.64 (0.95-7.29)	0.062
Any endometriosis				
Not present	114 (70.8)	47 (29.2)		
Present	8 (47.1)	9 (52.9)	1.76 (0.86-3.61)	0.110
Obliterated pouch of Douglas				
Not present	118 (68.6)	54 (31.4)		
Present	4 (66.7)	2 (33.3)	0.92 (0.23-3.79)	0.912
Soft signs				
Tenderness to probe				
No	113 (70.6)	47 (29.4)		

Yes	6 (46.2)	7 (53.8)	2.52 (1.48-4.33)	**0.000**
Decreased adnexal motion				
Not present	109 (71.7)	43 (28.3)		
Present	10 (47.6)	11 (52.4)	1.86 (0.96-3.60)	0.067

P value derived by univariant Cox-regression analysis

Table 2: Factors contributing to a gynaecologists decision to book surgery[a]

	n	%[b]
Severity of patients pain	39	89%
Duration of patients symptoms	32	73%
Failure of medical treatment	20	45%
Ultrasound findings	15	34%
Previous operation findings	9	20%
Level of patients anxiety or need for reassurance	9	20%
Examination findings	7	16%
Family history of endometriosis	5	11%
Other[c]	4	8%

[a]Forty-four of a possible 59 surveys for patients booked for surgery completed.

[b]Percentages total to more than 100% because all gynaecologists stipulated more than one factor.

[c]Fertility investigation (n=2) and anatomical abnormality requiring surgical intervention (n=2).

FIGURES

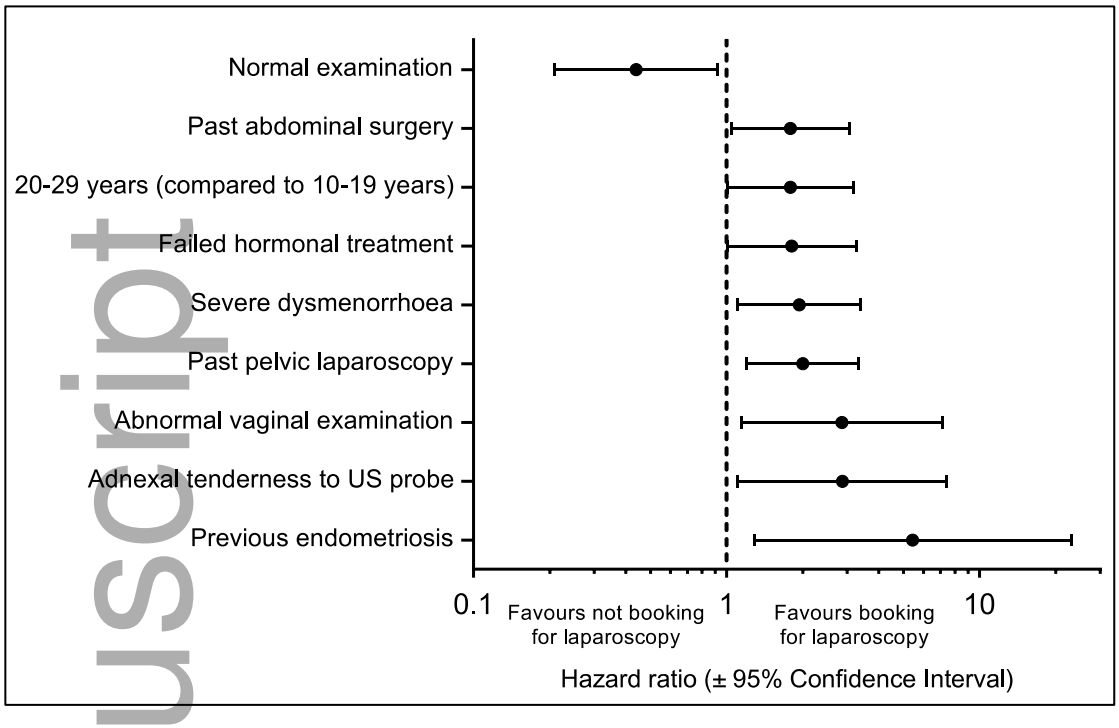

Figure 1: Summary of significant findings

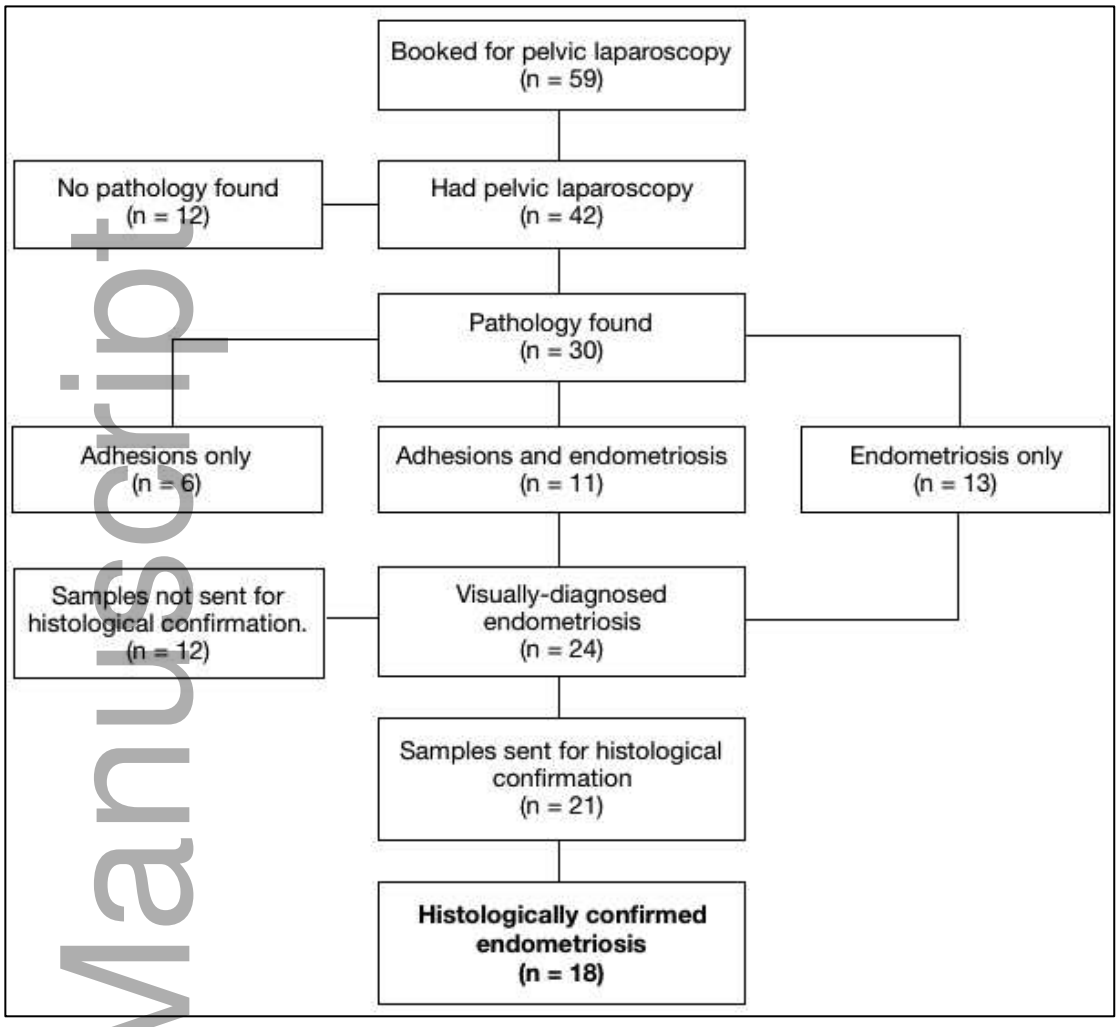

Figure 2: Summary of surgical findings

TABLES

Table 1: The relationship of patient characteristics, examination and ultrasound findings with booking for laparoscopy

Characteristics	Number of subjects and frequency %		HR (95% CI)	*P* Value
	Not booked for laparoscopy	Booked for laparoscopy		
Patient characteristics				
Age at Symptom Onset				
10-19 years	70 (74.5)	24 (25.5)	1	-
20-29 years	31 (57.4)	23 (42.6)	1.79 (1.01-3.18)	**0.046**
30-39 years	32 (86.5)	5 (13.5)	0.48 (0.18-1.26)	0.138
40-49 years	4 (80.0)	1 (20.0)	0.86 (0.12-6.36)	0.883
Duration of Symptoms				
6 months to 2 years	9 (81.8)	2 (18.2)	1	-
2 years to 5 years	10 (55.6)	8 (44.4)	3.07 (0.65-14.54)	0.158
5 years or more	37 (68.5)	17 (31.5)	1.91 (0.44-8.30)	0.387
Pain Symptoms				
Severe dysmenorrhoea				
Not present	73 (80.2)	18 (19.8)		
Present	79 (65.8)	41 (34.2)	1.94 (1.11-3.37)	**0.020**
Severe pelvic pain				
Not present	80 (76.2)	25 (23.8)		
Present	72 (67.9)	34 (32.1)	1.41 (0.84-2.37)	0.190
Severe dyspareunia				
Not present	116 (75.3)	38 (24.7)		
Present	36 (63.2)	21 (36.8)	1.60 (0.94-2.72)	0.086
Severe dyschezia				
Not present	119 (74.8)	40 (25.2)		
Present	33 (63.5)	19 (36.5)	1.55 (0.90-2.67)	0.118
Severe dysuria				
Not present	134 (73.2)	49 (26.8)		
Present	18 (64.3)	10 (35.7)	1.38 (0.70-2.72)	0.356
Satisfaction with pain control				
No	131 (71.6)	52 (28.4)		
Yes	21 (75.0)	7 (25.0)	0.84 (0.38-1.84)	0.658
Heavy Menstrual Bleeding				
Patient Reported				
Not present	53 (72.6)	20 (27.4)		
Present	89 (74.2)	31 (25.8)	0.95 (0.54-1.67)	0.864
Sanitary change <2 hourly				
Not present	73 (73.0)	27 (27.0)		
Present	73 (73.0)	27 (27.0)	0.99 (0.58-1.69)	0.980
Flooding				
Not present	50 (67.6)	24 (32.4)		
Present	93 (77.5)	27 (22.5)	0.68 (0.39-1.18)	0.171
Prolonged bleeding				
Not present	130 (73.4)	47 (26.6)		
Present	22 (64.7)	12 (35.3)	1.39 (0.74-2.63)	0.306
Gastrointestinal Symptoms				
Constipation				
Not present	85 (69.7)	37 (30.3)		
Present	67 (75.3)	22 (24.7)	0.82 (0.48-1.38)	0.452
Haematochezia				
Not present	141 (71.9)	55 (28.1)		
Present	11 (73.3)	4 (26.7)	0.97 (0.35-2.97)	0.949
Bowel Upset				
Not present	55 (67.9)	26 (32.1)		
Present	97 (74.6)	33 (25.4)	0.79 (0.48-1.33)	0.380
Urinary Symptoms				
Nocturia				
Not present	102 (71.3)	41 (28.7)		
Present	49 (73.1)	18 (26.9)	0.89 (0.51-1.55)	0.686
Frequency				

Not present	88 (58.3)	63 (41.7)		
Present	39 (66.1)	20 (33.9)	0.74 (0.43-1.27)	0.276
Urgency				
Not present	117 (70.1)	50 (29.9)		
Present	34 (79.1)	9 (20.9)	0.63 (0.31-1.28)	0.201
Other Symptoms				
Mood changes				
Not present	39 (70.9)	16 (29.1)		
Present	114 (72.6)	43 (27.4)	0.96 (0.54-1.70)	0.887
Medical Treatments for CPP				
Current medical treatment				
No	61 (78.2)	17 (21.8)		
Yes	91 (68.4)	42 (31.6)	1.49 (0.85-2.62)	0.166
Previous medical treatment				
No	63 (79.7)	16 (20.3)		
Yes	89 (67.4)	43 (32.6)	1.69 (0.95-3.00)	0.073
Failed hormonal treatment				
No	62 (80.5)	15 (19.5)		
Yes	90 (67.2)	44 (32.8)	1.81 (1.01-3.25)	**0.048**
Surgical History				
Past abdominal surgery				
No	83 (78.3)	23 (21.7)		
Yes	57 (63.3)	33 (36.7)	1.79 (1.05-3.05)	**0.032**
Past pelvic laparoscopy				
No	112 (77.8)	32 (22.2)		
Yes	40 (59.7)	27 (40.3)	2.00 (1.20-3.33)	**0.008**
Previous endometriosis				
No	15 (88.2)	2 (11.8)		
Yes	25 (50.0)	25 (50.0)	5.44 (1.29-23.02)	**0.021**
Obstetric History				
Previous infertility				
No	139 (72.8)	52 (27.2)		
Yes	13 (65.0)	7 (35.0)	1.28 (0.58-2.81)	0.547
Previous miscarriage				
No	103 (73.0)	38 (27.0)		
Yes	40 (67.8)	19 (32.2)	1.29 (0.74-2.24)	0.367
Previous pregnancy				
No	75 (75.0)	25 (25.0)		
Yes	68 (68.0)	32 (32.0)	1.34 (0.79-.2.26)	0.274
Previous vaginal delivery				
No	93 (68.9)	42 (31.1)		
Yes	50 (76.9)	15 (23.1)	0.70 (0.39-1.26)	0.233
Previous caesarean section				
No	123 (71.9)	48 (28.1)		
Yes	20 (69.0)	9 (31.0)	1.09 (0.53-2.22)	0.817
Desire for more children				
No	66 (68.7)	30 (31.3)		
Yes	63 (75.9)	20 (24.1)	0.73 (0.41-1.28)	0.265
Family History				
Pelvic Pain				
No	44 (74.6)	15 (25.4)		
Yes	94 (71.8)	37 (28.2)	1.13 (0.62-2.05)	0.696
Endometriosis				
No	90 (76.9)	27 (23.1)		
Yes	49 (65.3)	26 (34.7)	1.62 (0.94-2.78)	0.081
Heavy menstrual bleeding				
No	60 (75.9)	19 (24.1)		
Yes	78 (70.3)	33 (29.7)	1.29 (0.73-2.27)	0.380
Examination Findings				
General				
Normal examination				
No	42 (64.6)	23 (35.4)		
Yes	52 (83.9)	10 (16.1)	0.44 (0.21-0.92)	**0.030**
Abdominal tenderness				
No	46 (78.0)	13 (22.0)		
Yes	24 (75.0)	8 (25.0)	1.07 (0.44-2.59)	0.880

Vaginal Examination				
Abnormal vaginal examination				
No	33 (84.6)	6 (15.4)		
Yes	28 (58.3)	20 (41.7)	2.86 (1.15-7.12)	**0.024**
Deep tenderness				
No	1 (33.3)	2 (66.7)		
Yes	8 (61.5)	5 (38.5)	0.50 (0.10-2.58)	0.406
Uterine motion tenderness				
No	29 (67.4)	14 (32.6)		
Yes	4 (66.7)	2 (33.3)	0.72 (0.16-3.20)	0.665
Adnexal tenderness				
No	33 (82.5)	7 (17.5)		
Yes	13 (54.2)	11 (45.8)	2.87 (1.11-7.42)	**0.030**
Ultrasound Findings				
General				
Ultrasound findings				
Normal	64 (75.3)	21 (24.7)		
Abnormal	58 (62.4)	35 (37.6)	0.61 (0.36-1.10)	0.075
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Anteverted	84 (64.6)	46 (35.4)		
Retroverted	19 (76.0)	6 (24.0)	0.67 (0.34-1.32)	0.242
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Not present	121 (69.9)	52 (30.1)		
Present	1 (20.0)	4 (80.0)	2.64 (0.95-7.29)	0.062
Any endometriosis				
Not present	114 (70.8)	47 (29.2)		
Present	8 (47.1)	9 (52.9)	1.76 (0.86-3.61)	0.110
Obliterated pouch of Douglas				
Not present	118 (68.6)	54 (31.4)		
Present	4 (66.7)	2 (33.3)	0.92 (0.23-3.79)	0.912
Soft signs				
Tenderness to probe				
No	113 (70.6)	47 (29.4)		
Yes	6 (46.2)	7 (53.8)	2.52 (1.48-4.33)	**0.000**
Decreased adnexal motion				
Not present	109 (71.7)	43 (28.3)		
Present	10 (47.6)	11 (52.4)	1.86 (0.96-3.60)	0.067

P value derived by univariant Cox-regression analysis

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	n	**%[b]**

Severity of patients pain	39	89%
Duration of patients symptoms	32	73%
Failure of medical treatment	20	45%
Ultrasound findings	15	34%
Previous operation findings	9	20%
Level of patients anxiety or need for reassurance	9	20%
Examination findings	7	16%
Family history of endometriosis	5	11%
Other[c]	4	8%

[a]Forty-four of a possible 59 surveys for patients booked for surgery completed.
[b]Percentages total to more than 100% because all gynaecologists stipulated more than one factor.
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FIGURES

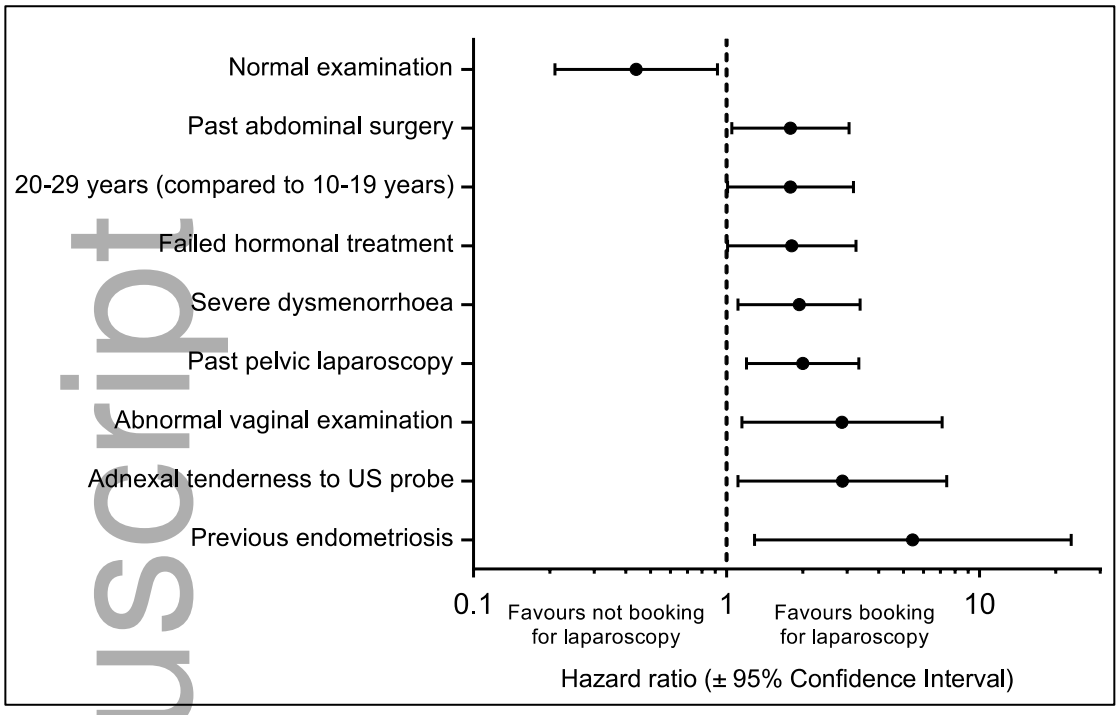

Figure 1: Summary of significant findings

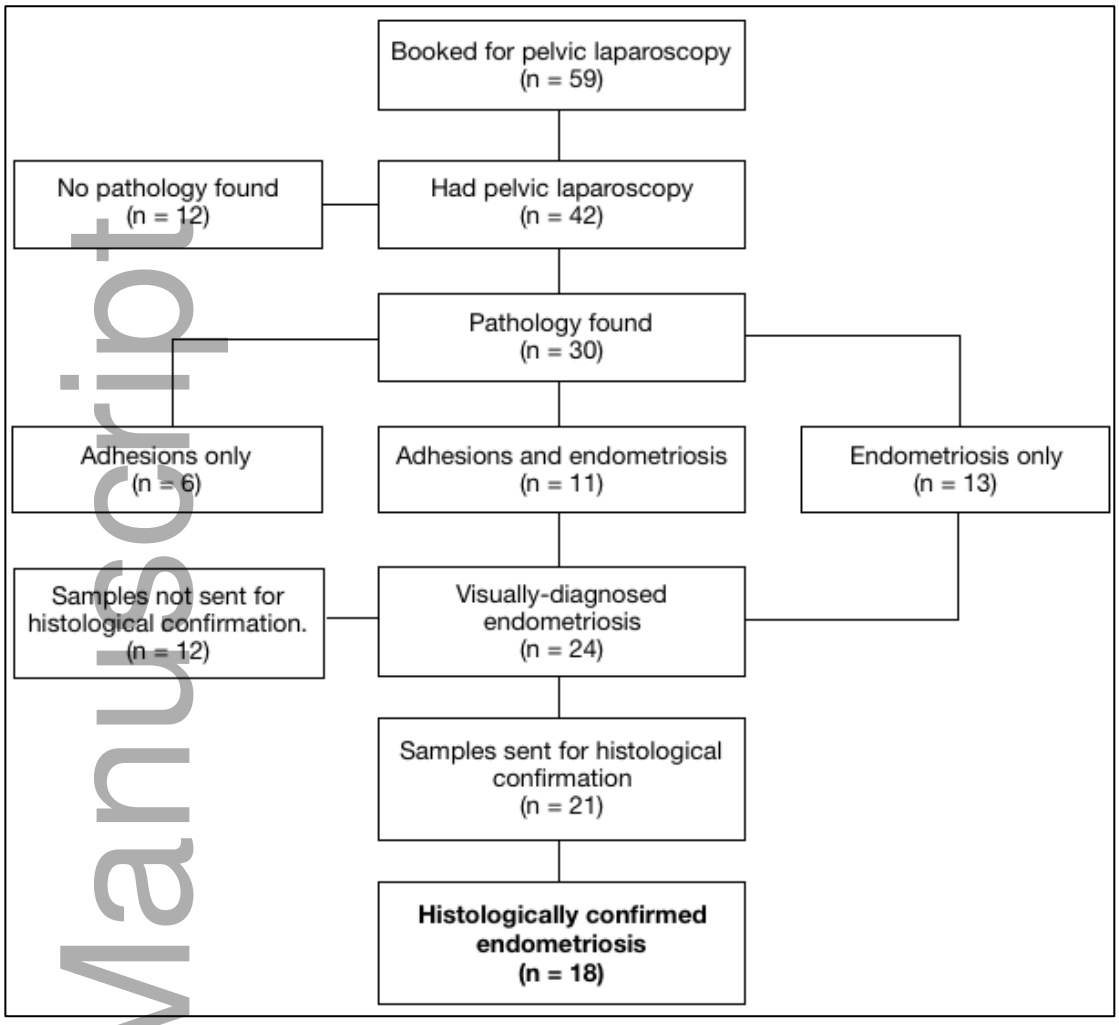

Figure 2: Summary of surgical findings