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Lashen, H., Jones, G.L., Duru, C. et al. (4 more authors) (2013) Bowel dysfunction after total abdominal hysterectomy for benign conditions: a prospective longitudinal study. European Journal of Gastroenterology and Hepatology, 25 (10). 1217 - 1222. ISSN 0954-691X

https://doi.org/10.1097/MEG.0b013e328362dc5e

Bowel dysfunction after total abdominal hysterectomy for benign conditions: a prospective longitudinal study

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Abstract

Background and aim On the basis of retrospective studies, hysterectomy has been considered a risk factor for functional bowel disorders. The aim of this study was to prospectively evaluate the patients' bowel function and general health-related quality of life (QoL) before and after hysterectomy. Our hypothesis was that hysterectomy in properly selected patients can impact positively on the patients' self-reporting of their general health and bowel function.

Materials and methods A prospective longitudinal observational study was conducted in a university-based teaching hospital. Eighty-five patients who were scheduled for total abdominal hysterectomy for a non-malignant cause completed the study. The main outcome measure was the patient's perception of her bowel function, which was assessed preoperatively and at 6, 12, 26 and 52 weeks postoperatively using the gastrointestinal quality of life questionnaire. The patient's general health was also assessed using a generic general health questionnaire (EQ5D and EQVAS). The effect of time on change in questionnaire score was assessed using mixed model repeated measures at a significance level of 0.05.

Results The scores in the three questionnaires declined significantly at 6 weeks postoperatively as compared with those obtained preoperatively. However, there was a subsequent increase in the scores up to 12 months postoperatively. Smoking and use of laxative were identified as potential confounding variables.

Conclusion Apart from a transient negative effect, total abdominal hysterectomy improves the patient's gastrointestinal-related QoL, probably as part of general improvement in their QoL.

Keywords: bowel, dysfunction, function, hysterectomy

Introduction

As many as 100 000 hysterectomies [1,2] are performed annually in the UK. In the USA it has been estimated that by the age of 60, nearly one in three women would have undergone hysterectomy [3,4]. Common benign indications for hysterectomy include symptomatic fibroids, which are the most common uterine tumour and account for about 30% of all hysterectomies in women over the age of 30 [5,6]. Other causes include menorrhagia, dysmenorrhoea, endometriosis and chronic pelvic pain [5,6].

Over the years, various techniques for hysterectomy have been described reporting different benefits and complications [1,7–9]. Complications of hysterectomy occur in nearly half of the abdominal hysterectomies [10]. The most common reported complications have been infection, haemorrhage, pain, thromboembolic events and unintended surgical procedures [11–13]. Post hysterectomy complications have been related to several risk factors including age (very young or women over 70 years old), obesity, history of pelvic surgery [13,14] and parity [15]. Complications related to bowel, urinary and sexual function have received a great interest because of their impact on the women's quality of life (QoL).

Bowel dysfunction as a post hysterectomy complication was suggested in various retrospective studies in the late 1980s and early 1990s [16–22]. However, the retrospective nature and lack of preoperative bowel function assessment limited the value of such studies. Numerous prospective studies ensued and were often contradictory [12,23–33]. However, the lack of questionnaire validation [12,23,31–33] affected the quality of such studies. Furthermore, none have examined the patients' symptoms in the context of global health or QoL, arguably the most important perspective from which to view symptoms (http://www.nice.org.uk/nicemedia/live/11927/39622/39622.pdf).

The aim of this study was to prospectively assess the short-term and medium-term effect of total abdominal hysterectomy (TAH) on gastrointestinal function and general health-related QoL.

Materials and methods

The study was approved by the Local Research Ethics Committee; it was peer reviewed and met all research governance requirements. In all, 100 women over the age of 18 years who were scheduled for TAH were recruited between March 2008 and April 2009. All patients were identified from their clinical records. Exclusion criteria included malignancy or radical hysterectomy. The operations were carried out at a university-based teaching hospital. Those who agreed to take part gave written consent and completed the first set of questionnaires ~2 weeks before their scheduled surgery, in the preoperative clinic. The operations were performed by an appropriately qualified surgeon.

Patients were assessed symptomatically using validated generic gastrointestinal function and general health-related QoL questionnaires.

Gastrointestinal quality of life index

This is a validated disease-specific QoL questionnaire that was designed to assess gastrointestinal-related QoL [34]. Of the 36 questions, 19 are specific to gut function or the ability to eat and the remainder focussing on the impact of symptoms on social and sexual health and activities of daily living. Patients answer each question on a five-point scale of severity. The overall scores therefore range from 0 to 144; the higher the score, the better the patient's perception of her bowel function [34]. The gastrointestinal quality of life index (GIQLI) has been used in several recent studies [35–39].

EQ5D

Formerly called the EuroQoL, the EQ5D is a generic, well-validated preference-based tool [40,41] that is used to measure patients' self-reported health-related QoL. It is a short and simple to use questionnaire, which is made up of two parts one of which is a visual analogue scale [42]. The EQ5D has also been used by other studies [43,44] to assess the QoL of patients before and after hysterectomy.

The questionnaires were administered ~2 weeks before surgery at the preoperative clinic, and postoperatively at ~6, 12, 24 and 52 weeks. Reminders were sent to patients if no

response was obtained to the first questionnaire after 14 days. Demographic information was obtained from the patient's medical notes postoperatively for statistical analysis.

Statistical and data analysis

The statistical package for social sciences for Windows, version 19 (SPSS Inc., Chicago, Illinois, USA) was used throughout the data analysis and significance was set at a level of 5% except where otherwise stated. A sample size of 53 and 85 achieves a 90% power to detect a difference of 10 and 5 points, respectively, at a significance level of 0.05 in the GIQLI scores from baseline, based on an estimated SD of 22 and 14, respectively. The questionnaires were scored according to their appropriate scoring algorithms and then summarized using descriptive statistics for each time point. The effect of time on the change in score from preoperative to 6 weeks postoperative and 12 months postoperative was assessed using mixed model repeated measures. Multiple linear regression was used to examine the effect of age, parity, BMI preoperative pelvic pain as an indication, duration of surgery, in-patient stay duration, use of laxatives postoperatively and oophorectomy on the outcome at 12 months postoperative. For each questionnaire, models were fitted with the change in score from preoperative to 12 months postoperative as the dependent variable and the possible confounding variable and the preoperative score as the independent variables.

Results

A total of 100 patients were recruited at the baseline. However, 15 were excluded by the end of the study in July 2010 for the following reasons: one operation was cancelled, four patients had subtotal hysterectomy and 10 had dropped out. Dropouts were defined as those who did not respond or returned at least one of the postoperative questionnaires blank. Figure 1 is a flow diagram of the patients who approached, recruited and completed the study. Demographic information was obtained from the patient's medical notes before and after surgery. Mean (SD) age and BMI were 46.5 (5.6) years and 28.2 (5.4) kg/m^2, respectively. The median parity was 2.

Indications

The most common indications for surgery were menorrhagia (69.4%), fibroids (55%), dysmenorrhoea and pelvic pain (29.6%), endometriosis (14%), abnormal uterine bleeding (11%) and ovarian mass (12%). Some women had more than one symptomatic indication hence the total exceeds 100%.

Intraoperative and postoperative events and complications of total abdominal hysterectomy

The duration of the operation ranged from 30 to 180 min, with an average of 95 min. The range of hospital stay was between 3 and 11 days; one patient's stay duration lasted for 11 days because she had to be taken back to theatre for another surgical procedure. All other patients were admitted for a duration ranging between 3 and 6 days. Intraoperative blood loss was visually estimated from the swabs used during the operation and the contents of the suction apparatus receiver (Table 1).

Changes in quality of life measures

Examination of the mean [95% confidence interval (CI)] of the questionnaire scores in Table 2 and Fig. 2 shows a decline in the scores of the three questionnaires at 6 weeks postoperative compared with the preoperative scores. The longitudinal model shows that this change was statistically significant for the EQ5D (– 0.07, 95% CI: – 0.12 to – 0.29, P=0.001) but not statistically significant for the GIQLI (– 6.6, 95% CI: – 13.2 to 0.1, P=0.055) nor the EQVAS (– 0.4, 95% CI: – 9.9 to 1.9, P=0.184). However, there were overall increases in the scores of the three questionnaires at 12 months postoperative compared with the preoperative scores. The longitudinal model shows that these changes are statistically significant for the GIQLI (13.1, 95% CI: 6.2–20.1, P<0.001), the EQ5D (0.05, 95% CI: 0.004–0.09, P=0.031) and the EQVAS (7.1, 95% CI: 1.2–13.1, P=0.019).

The analysis of the confounding variables found a statistically significant difference in the 12-month change of GIQLI scores between smokers compared with non-smokers (– 14.4, 95% CI: – 24.8 to – 3.9, P=0.008) and a statistically significant difference in the 12-month change of EQ5D scores between those who used laxatives postoperatively compared with those who did not (0.05, 95% CI: 0.001–0.10, P=0.048). None of the other potential

confounding variables made a statistically significant difference to the 12-month change in scores.

Discussion

The study prospectively assessed the self-reported bowel function and general health status of women undergoing TAH for benign conditions preoperatively and up to a year postoperatively and showed no overall detrimental short-term and medium-term effects of TAH on bowel function. All the patients were treated in the same centre, assessed before and after hysterectomy, and were seen more frequently in the first year than any previous study.

Concerns about the possibility of adverse effects of hysterectomy on bowel function are well founded. Surgical injury to the inferior hypogastric plexus, intimately related to the cervix, cardinal and uterosacral ligaments might affect the autonomic innervation of the distal colon [22,45,46]. Damage to the fibromuscular pelvic floor and traction injury to the pudendal nerve could lead to abnormalities of pelvic descent during defecation [47,48] and the development of enterocele or rectocele giving rise to symptoms of obstructed defecation or incontinence [47,48].

Accordingly, it has been commonly thought that women with gynaecological symptoms concomitantly suffer from bowel dysfunction, particularly those with a previous history of gynaecological surgery based on retrospective evidence [23,49,50].

Our study shows that after a transient deterioration in QoL and bowel function postoperatively, both gastrointestinal-specific and general QoL indices improved at 12 weeks and were sustained at 6 and 12 months. The 6-week deterioration is likely to reflect incomplete resolution of symptoms occurring as a consequence of surgery. Subsequent sustained improvement suggests that hysterectomy per se is not associated with a long-term detrimental effect on gut function when patients are carefully selected for surgery.

It is interesting to speculate why this study demonstrates a more favourable outcome than some previously published studies. More conservative treatment modalities for the management of menorrhagia, a common indication for hysterectomy, have emerged in the last two decades, and this might indicate that surgeons are selecting more appropriate patients to offer hysterectomy, thus resulting in a better outcome.

It is possible that further change in bowel function might occur beyond the 1-year follow-up period used in this study. Previous prospective studies on posthysterectomy patients have performed reassessments after as little as 16 weeks [25] and as long as 3 years, but the majority of the studies have been up to a maximum of 1 year postoperatively [8,26,27,30–33]. Furthermore, one study that assessed patients at both 1 and 3 years postoperatively [28] showed an increased risk of anal incontinence after hysterectomy, but this was evident at 1 year and persisted at 3 years and there were no other differences in bowel function preoperatively and postoperatively or between the two time periods. Nonetheless, it remains possible that further changes may manifest in time.

It has been reported that young age at hysterectomy impacts psychological well-being [51], which was not observed in this study. The GIQLI and EQ5D are not specific measures of psychological well-being; however, both contain specific domains containing questions about mental well-being that contribute to the overall scores.

Conclusion

TAH has a transient negative effect on patients' gastrointestinal QoL, which gradually resolves. Patient selection and preoperative assessment may explain previous reports of hysterectomy having an adverse effect on bowel function.

Acknowledgements

The study was funded by a small grant from Sheffield Teaching Hospital NHS Trust (the host institution).

Conflicts of interest

There are no conflicts of interest.

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Table 1: Operative and postoperative data

Variables	
Duration of surgery (minutes)	
Mean ± SD	95.48 ± 31.172
Median	95
Range	30 – 180
Duration of hospital stay (days) – including days of admission and discharge	
Mean ± SD	4.83 **±** 1.316
Median	5
Range	3 – 11
Estimated blood loss (mls)	
Mean ± SD	393.59 ± 303.803
Median	300
Range	100 – 2500
Concomitant procedures	**Total number (%)**
Adhesiolysis	6 (7.1)
Omentectomy	3 (3.6)
Cystoscopy	2 (2.4)
Ureteral stenting	1 (1.2)
Colpo-suspension	1 (1.2)
Postoperative events:	
Use of laxatives	28 (33.3)
Pyrexia (both explained and unexplained)	15 (17.9)
Wind pain	12 (14.3)
Haematuria	10 (11.9)
UTI	3 (3.6)
Wound haematoma	3 (3.6)
Faecal incontinence	1 (1.2)
2ry Haemorrhage	1 (1.2)
Re-admission to hospital	1 (1.2)
Wound dehiscence	1 (1.2)
Ovary status	
Bilateral oopherectomy	45 (52.9)
Unilateral oopherectomy	9 (10.5)
No oopherectomy	31 (36.5)

Table 2: Summary statistics of questionnaire scores

	N	Mean	SD	Median	95% CI Confidence Interval
GIQLI scores					
GIQLI scores at preop	77	105.6	20.4	109.0	100.9 - 110.2
GIQLI score at 6 wks	67	99.0	20.2	106.0	94.1 – 103.9
GIQLI score at 12wks	74	110.3	20.5	116.5	105.6 – 115.1
GIQLI score at 24wks	63	117.4	19.1	125.0	112.6 – 122.2
GIQLI score at 52wks	62	118.7	20.8	126.0	113.4 – 124.0
EQ-5D					
EQ-5D at preop	84	0.87	0.13	0.84	0.84 – 0.90
EQ-5D at 6wks	72	0.80	0.14	0.82	0.76 – 0.83
EQ-5D at 12wks	75	0.88	0.12	0.84	0.85 – 0.90
EQ-5D at 24wks	65	0.89	0.14	1.00	0.86 – 0.93
EQ-5D at 52wks	65	0.92	0.13	1.00	0.88 – 0.95
EQ-VAS					
EQ-VAS score at preop	77	76.3	18.6	80.0	72.0 – 80.5
EQ-VAS score at 6wks	66	72.3	17.0	78.0	68.1 – 76.5
EQ-VAS score at 12wks	68	78.4	19.5	84.5	73.7 – 83.1
EQ-VAS score at 24wks	61	84.6	13.0	90.0	81.3 – 78.9
EQ-VAS score at 52wks	57	83.4	16.1	89.0	79.1 – 87.7

N = the number of patients who completed the questionnaires at all time periods

Figure 1: Patients' responses to questionnaires

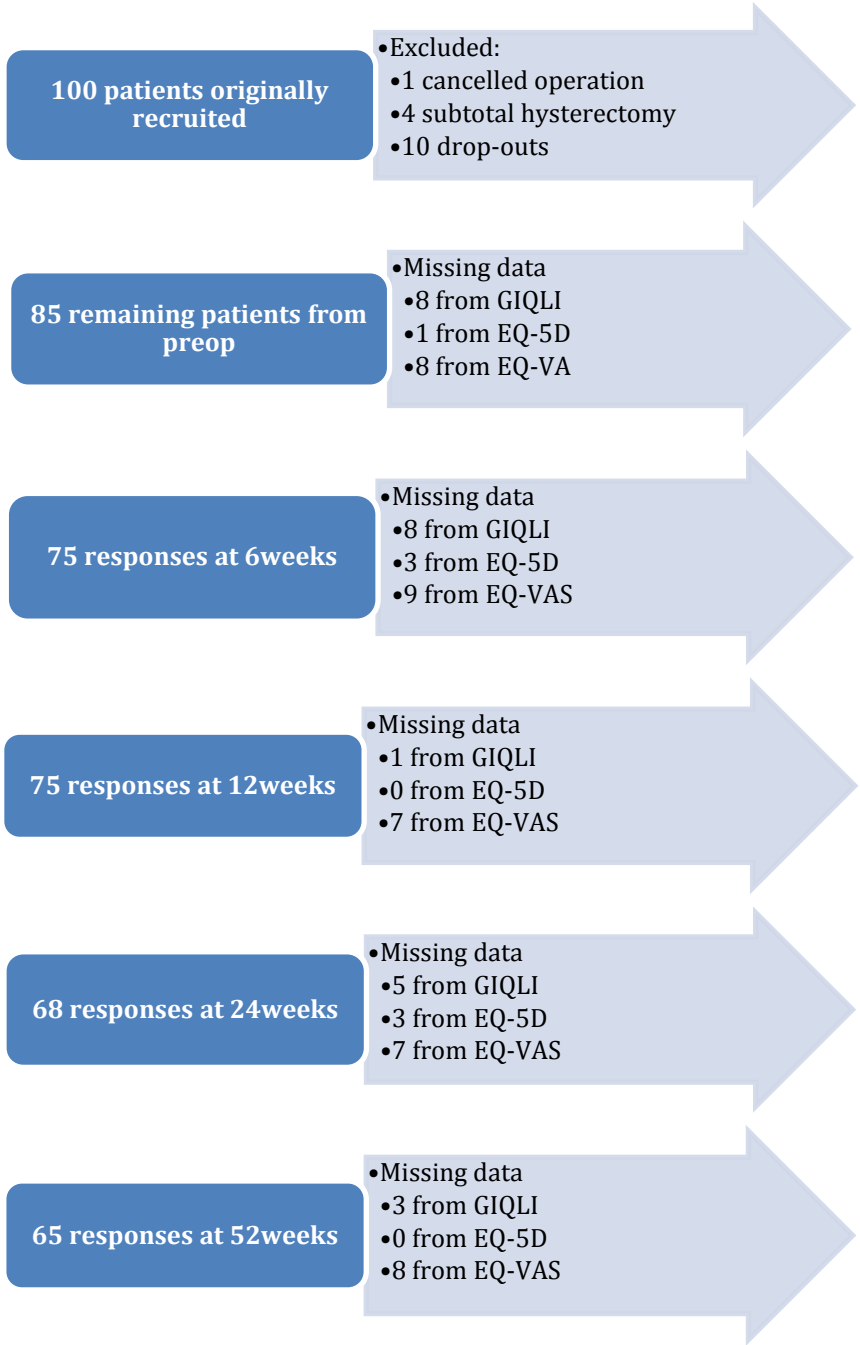

Figure 2: Mean questionnaire scores and 95% confidence intervals. (a) GIQLI, gastrointestinal quality of life index; (b) EQ5D; and (c) EQVAS