SHORT REPORT

Effect of early physical therapy interventions on post-operative ileus following abdominal hysterectomy

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Abstract

This study was conducted to determine the effect of early physical therapy intervention on symptoms of post-operative ileus after abdominal hysterectomy. This randomised control trial was carried out at the Railway General Hospital, Rawalpindi, Pakistan, from February 2021 to July 2021. Participants were randomly allocated to experimental (n=21) and control (n=21) groups using sealed envelope method. The experimental group received an enhanced physiotherapy rehabilitation plan of care consisting of patient education, breathing exercises, early mobilisation, connective tissue manipulation, and transcutaneous electrical nerve stimulation, while the control group only performed ambulation. The intervention was carried out during the first three days after surgery. Subjective measures were used to determine post-operative ileus. The study results conclude that enhanced early post-operative rehabilitation programme following abdominal hysterectomy has the potential to improve symptoms of post-operative ileus.

Keywords: Connective tissue, Early ambulation, Hysterectomy, Ileus, Physical therapy, Rehabilitation.

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Introduction

Hysterectomy, or the removal of uterus, is the second most commonly performed surgical procedure after caesarean section.[1] Around 6.1 to 8.6 per 1,000 women undergo hysterectomy worldwide.[2] Hysterectomy can affect women's psychological, emotional, and physical health; hence, various outcomes are associated with it such as low quality of life, pelvic pain, painful intercourse, urinary incontinence, fatigue, prolonged hospital stay, and increased hospitalisation cost.[3]

Most patients undergoing abdominal surgeries tend to develop postoperative ileus (POI) which is defined as intolerance of oral intake, bowel distention, decreased or absent bowel sounds, flatus, and disturbed bowel movements.[4] Postoperative inhibition of GI motility can lead to debilitating symptoms, such as bloating, nausea, vomiting, delayed time of defecation and flatus, inability to tolerate solid food, increased postoperative pain, and poor wound healing resulting in late mobilisation.[4] POI can extend the hospital stay by five days, increasing the total hospital costs as the rate of readmission was 0.2% in non-POI patients as compared to 3.6% in patients with POI.[5]

Various physical therapy interventions have been significant in improving post-operative recovery following abdominal surgeries.[6] Physical therapy encourages early mobilisation after surgery, in addition to breathing exercises which are reportedly effective in reducing respiratory complications after abdominal surgeries.[7, 8] Connective tissue manipulation (CTM) is a reflex-induced therapy that has been considered effective in multiple domains, including initiating bowel movements to relieve constipation and regulating GIT motility.[9]

It is generally believed that physiotherapy aims to aid recovery and prevent complications in the acute phase after surgery. However, no well-designed randomised control trial has exclusively investigated the effect of early physiotherapy interventions on various health aspects, especially post-operative ileus following abdominal hysterectomy. Hence, the present study aimed to investigate the effect of early physical therapy interventions on symptoms of post-operative ileus.

Patients/Methods and Results

This randomised control trail (registry number: NCT04686032) was conducted at the Railway General Hospital Rawalpindi, Pakistan, from February to July 2021. The study participants, which included 42 females, were randomly divided into two groups: interventional group and control group with 21 patients in each group, using opaque sealed envelope method. The sample size was

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Table-1: Baseline data for both groups

Baseline Characteristics		Experimental Groupn= 21 (%)	Control Groupn=21 (%)	*P* value
Age (years)		56.81 (± 9.95)	56.62 (± 8.65)	0.930
No. of Children		4	4	0.818
Co morbidities	Diabetes Mellitus	4 (19.0%)	2 (9.5%)	0.896
	Hypertension	5 (13.8%)	5 (23.8%)	
	Diabetes & Hypertension	2 (9.5%)	7 (33.3%)	
	Hepatitis	2 (9.5%)	0 (0.0%)	
	None of the above	8 (38.1%)	7 (33.3%)	
Diagnosis	Fibroids	8 (38.1%)	7 (33.3%)	0.698
	Post-menopausal/ Unexplained bleeding	8 (38.1%)	8 (38.1%)	
	Other	5 (23.8%)	6 (28.6%)	
Menopause		14(66.7%)	15(71.4%)	0.742

Table-2: Between group analysis of post-operative ileus

Variables	Group	Mean +SD	Median (IQR)	*p* value
*Time to tolerance of oral diet	Cont.	-	27 (3.5)	= 0.828
	Exp.	-	26 (2.0)	
**Time to passage of stool	Cont.	66.33 (+10.1)	-	= 0.153
	Exp.	60.87 (+ 8.9)	-	
**Time to passage of flatus	Cont.	57.67 (+10.04)	-	= 0.044
	Exp.	49.13 (+11.24)	-	

*Mann Whitney U test was applied for time to tolerance of oral diet as the P value < 0.05
**Independent t-test was applied for variable of time to passage of stool and flatus as the P value > 0.05..

Table-3: Frequency of passage of flatus and stool among participants

Groups	Passage of first stool		Passage of first flatuse	
	Yes N (%)	No N (%)	Yes N (%)	No N (%)
Control (N=21)	12 (57.14%)	9 (42.85%)	19 (90.5%)	2 (9.5%)
Experimental (N=21)	16 (76.19%)	5 (23.80%)	20 (95.2%)	1 (4.8%)

calculated through OpenEpi[10] and variable used from a study was defecation, with the mean and standard deviation of the experimental and control group being 42:42 (±15:52) and 57:16 (±18:11), respectively (CI=95% Power=80%).[11] Non-probability consecutive sampling was used and informed consent was obtained from each patient prior to participation. Females who underwent open abdominal hysterectomy, were vitally stable, and responsive and had no limitation on physical activities due to any medical problem were included in the study. Females who had undergone laparoscopic or vaginal hysterectomy, or had metastatic cancer, any neurological or cognitive deficit, respiratory diseases, intestinal problems, or had frequent constipation in general or/and had been recommended on medical grounds not to participate in early physical activity were excluded from the study. Effect on post-operative ileus was monitored by time to tolerance of oral diet (solid food) (hours:min), time to passage of stool (first defecation) (hours:min), and time to first passage of flatus (hours:min).[12]

Supervised rehabilitation protocol was followed on first three post-operative days. On postoperative day one, participants in the experimental group performed 30 minutes of activity involving bed mobility training, transfer, and huffing techniques, ambulation with assistance, in bed exercises such as plantarflexion/dorsiflexion, stretching of neck and upper extremity, and active exercises of lower limb (1 set x 10 rep), deep breathing exercises (5 rep x 3 set), connective tissue manipulation for intestinal motility (5 min), and TENS (120 Hz and pulse width of 60 micro second) for incisional pain (30 min). On post-op day two, the participants ambulated for 15 minutes with minimum assistance, performed in bed exercises (10 rep x 1 set) such as resisted plantarflexion/dorsiflexion, active resisted lower limb, and resisted upper extremity exercises, pelvic tilting/rolling, and stretching (neck and upper extremity), deep breathing with forced expiratory technique (5 rep x 3set), connective tissue manipulation (5 min), and TENS for 30 minutes. On day three, the participants ambulated independently under supervision, performed in bed exercises (10 rep x 1 set) such as resisted upper and lower limb exercises, pelvic tilting/rolling and active stretching, deep breathing with forced expiratory technique (5 rep x 3set), and connective tissue manipulation (5 min) and TENS (30 min).

The control group participants were provided basic education on bed mobility and transfer techniques on day one, along with 15 minutes of ambulation. On postoperative day two, they performed assisted ambulation for 15 minutes and sitting in chair or bedside for 15 minutes, while on postoperative day three they performed ambulation for 30 minutes under supervision.

Shapiro Wilk test was applied to check normality of data. For between group analysis of post-operative ileus; Mann Whitney U test (comparing Median- IQR) was applied for analysing time to tolerance of oral diet as the P value < 0.05, while independent t-test (comparing Mean + SD) was applied for variable of time to passage of stool and flatus as the P value > 0.05. The data was analysed using

SPSS Version 21.

The mean age of the participants was 56.81± 9.95 years and 56.62±8.65 years in experimental and control groups, respectively. The baseline characteristics for both groups were similar with p value >0.05.

There was no statistically significant difference between experimental and control groups for both time to tolerance of oral diet and passage of stool as reflected by their P values 0.828 and 0.153, respectively. However, there was statistically significant difference in time to passage of flatus with P value 0.044 between groups as well as clinically significant difference in the time to passage of stool with mean time of 60.87 + 8.9 for experimental group as compared to 66.33+10.1 for the control group.

Another important component worth mentioning is that 9(42.8%) patients from the control group did not pass stool during the first three post-operative days as compared to 5 (23.8%) patients from the experimental group.

Discussion

The study showed statistically significant difference in time to passage of first flatus between groups in addition to participants in the experimental group passing stool earlier than participants from the control group as reflected from their mean time. A study, published in 2019, exploring the acute effects of CTM used similar technique as the present study and observed that when autonomic nerve endings located in the tissue interface are stimulated by specific stroking of the skin, it results in a reduction of sympathetic vasoconstrictor tone leading to vasodilatation.[13] A similar study supported the results of the present study stating that CTM can help in improving constipation and regulating bowel movements by increasing blood flow to the region.[9] Passive exercise of the lower limbs and trunk facilitates intestinal motility by stretching the intestinal tract and enhancing parasympathetic nerve activity, which physiologically facilitates the smooth muscle activity within intestines thus regulating bowel movements.[14]

Conclusion

From results of the current study, it is concluded that an enhanced early post-operative rehabilitation programme following abdominal hysterectomy has the potential to improve symptoms of post-operative ileus.

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Conflict of Interest: None.

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