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ENCHANCED RECOVERY AFTER SURGERY IN PATIENTS UNDERGOING TOTAL ABDOMINAL HYSTERECTOMY

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ABSTRACT

BACKGROUND: In order to lessen the duration of hospital stay, improve the patient outcomes, standardized approach like the Enhanced Recovery After Surgery (ERAS) is very helpful. The study aimed to evaluate the benefit of ERAS protocol for faster recovery in patients who underwent abdominal hysterectomy.

MATERIAL AND METHODS: This study included 50 patients who underwent total abdominal hysterectomy admitted in the Obstetrics and Gynaecology department of Vinayaka mission's kirupananda Variyar medical College and hospital hospital and used a prospective design. The patients were explained about ERAS protocol and analysed for post-operative complications and recovery.

RESULTS: The mean age of the study participants was 50 ± 5.6 years with 34% of them diagnosed with endometriosis. The duration of hospital stay was 6 ± 1 day where the post-operative stay was 3.7 ± 1.1 day. The time to first flatus was 12.5 ± 3.2 hours while the time span to first oral nutrition was 33.9 ± 7.2 hours. About 88% of the sample had no complications in the post-surgical period.

CONCLUSION: By adhering to the ERAS protocol, benefit to the patients was seen in the form of fewer complications, early recovery, and faster discharge from hospital.

KEY WORDS: ERAS protocol, Abdominal hysterectomy, Post-operative complications

INTRODUCTION

The health care in the present time focuses on reducing the complications arising due to surgical procedures and in facilitating speedy recovery in the post-operative period. An evidence-based application that aligns with this notion is the "Enhanced Recovery After Surgery" (ERAS) protocol created by the ERAS Society.[1] The ERAS programme is an intricate network of processes that involves a team of specialised professionals including nursing staff, anaesthesiologists, gynaecologists, and psychiatrists. They work together to provide care for the patient before, during, and after surgery. The ERAS protocol involves a series of steps: educating and consulting with the patient before surgery, providing the patient with fluids and carbohydrates to reduce fasting, using multiple methods for pain management, minimising the use of opioid analgesics, preventing infections at the surgical site, avoiding venous thromboembolism, and promoting early mobilisation.[2] The practices are designed to minimise the impact of surgical stress and promote swift patient recovery post-surgery. The ERAS procedure was initially implemented in 1997 during colorectal surgery, yielding satisfactory outcomes.[3]

In the field of gynaecological surgery, one of the most common and frequently used procedure is hysterectomy. Though a variety of lesser invasive techniques like vaginal or laparoscopic surgical procedures are suggested, total abdominal hysterectomy remains the most conventional surgery to be performed in most cases.[4] Due to early mobilization, early discharge from hospital, lesser chances of infection, laparoscopic or vaginal hysterectomy are preferred choices over the abdominal hysterectomy.

Moller et al.,[5] carried out a comparative prospective descriptive study to identify the elements delaying the early discharge in 32 women undergoing either laparoscopically assisted vaginal hysterectomy or abdominal hysterectomy. They used a setting where the

patients were provided with information, given assistance for early mobilization, food intake and assistance in case of any pain by giving treatment. Their findings indicated the need for further studies where recovery post-surgery is accelerated.

A prospective randomized controlled study was carried out by Yilmaz G, Akca A, Kiyak H, and Salihoglu Z (2020) examined the effects of the ERAS protocol on the duration of time until patients were able to walk, the length of their hospital stay, the rate of readmissions, and the occurrence of postoperative problems in individuals following minor gynaecological surgical operations. About 104 patients were assigned to either ERAS treatment or conventional care group, who were receiving minor laparoscopic and hysteroscopic gynaecological procedures. Details pertaining to the patient's progress in the form of time to faeces, and solid meal intake, as well as any complications and length of stay (LOS), were documented. Their findings indicated a statistically significant ($p < 0.001$) outcome in relation to the intake of lower volume of intravenous fluid given during the perioperative and postoperative phases, lesser time to first faeces, shorter time for ingesting solid food and early mobilization in the ERAS group compared to the traditional care group. The ERAS group had a considerably shorter length of stay ($p < 0.001$) compared to the standard care group. [6]

Ample research has been conducted to study the benefits of applying ERAS protocols on patients who had undergone gastric, colorectal, urologic, and pancreatic surgeries. The outcome in these literature points towards the successful aftermath of the patients in the form of decreased length of hospital stay, alleviated postoperative pain, promoted early ambulation, and also reduced occurrence of potentially severe medical complications. [6-9] Nevertheless, there is a scarcity of data on the impact of the ERAS protocol on enhancing postoperative results and compliance in patients following gynaecological surgery, specifically for modest laparoscopic and hysteroscopic operations. Hence, the present study aims to analyse the recovery rate of the patients who underwent abdominal hysterectomy by applying the ERAS protocols.

MATERIALS AND METHODS

The Helsinki Declaration principles were followed, and the approval of the Institutional Ethics Committee was obtained while doing the present study. A written informed consent indicating the willingness to participate in the study was obtained from all the participants prior to the starting of the research. This is a prospective study involving 50 patients who had abdominal hysterectomy and admitted in the Obstetrics and gynaecology in Vinayaka mission's kirupananda Variyar medical College and hospital hospital between August 2022 to August 2023. Patients who were aged between 45-60 years old and had completed their family life with an inclination to participate in the research and who had total abdominal hysterectomy were included in this investigation. Those patients who had major complications or comorbidities like adhesions, morbid obesity, and malignancy, who showed disinterest to take part in the inquiry by not giving consent for ERAS were excluded for this study.

METHOD: All the patients were subjected to pre-operative investigations. They were given detailed information regarding the ERAS protocol. Implementing the ERAS protocol necessitated a diverse team. The team comprised a gynaecologist, anaesthetist, nurse specialist, and ward nurse supervisors who were given elaborate instructions regarding the care to be taken for preoperative, intraoperative, and postoperative procedures. Pre-operative care was taken for bowel preparation, dietary intake, avoidance of other medications prior to surgery and prophylaxis against thromboembolism. Intra-operative care given in the form of adequate intravenous fluids to maintain homeostasis, giving intravenous prophylaxis antibiotics, maintenance of anaesthesia and avoiding abdominal drain as possible. In the post-operative period, the patients were encouraged to towards early mobilization, removal of catheters, starting oral intake at the earliest, giving non-opioids for controlling pain, and overall assistance for early discharge from hospital.

Statistical Analysis: The data collected was entered into excel sheet which was then calibrated using SPSS version 23. Continuous variables were expressed in the form of mean and standard deviation using descriptive statistics and frequency for categorical variables were examined. Chi-square test was used for identifying significance among qualitative variables.

RESULTS

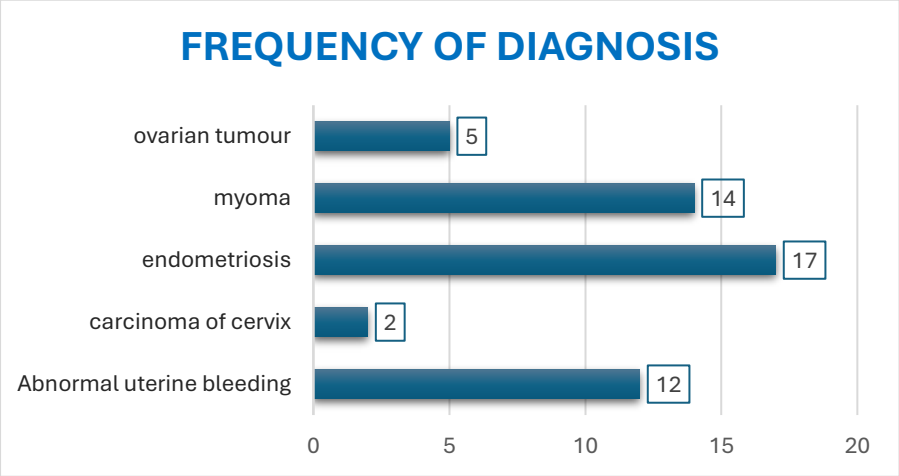
Table 1 describes the study characteristics, where the mean age of the sample was 50 ± 5.6 years. The majority of the patients(34%) in the study population were aged between 51 to 55 years. The mean BMI of the participants was 23.8 ± 4.1 with most of them (46%) belonging to the normal category. Among 86% of the study participants hysterectomy with salpingectomy was the surgical procedure done while in 10% patients' oophorectomy was also added to the above two procedures. Only in 4% of the cases radical hysterectomy was carried out.

Table 1. Study Sample Characteristics

Variable		Frequency	Percent
Age group (50± 5.6 years)	40-45YRS	12	24.0
	46-50YRS	10	20.0
	51-55YRS	17	34.0
	56-60YRS	11	22.0
BMI group (23.8±4.1)	Under weight	8	16.0
	Normal	23	46.0
	Overweight	15	30.0
	Obese	4	8.0
Diagnosis	Abnormal uterine bleeding	12	24.0
	carcinoma of cervix	2	4.0
	endometriosis	17	34.0
	myoma	14	28.0
	ovarian tumour	5	10.0
Surgery	hysterectomy+ salpingectomy	43	86.0
	hysterectomy+ salpingectomy+ oophorectomy	5	10.0
	Radical hysterectomy	2	4.0

The below figure 1 depicted the frequency of diagnosis in the patients. About 34% of the sample had endometriosis, followed by 28% with myoma, 24% with abnormal uterine bleeding, ovarian tumour in 10% and 4% of patients diagnosed with carcinoma of cervix.

Figure 1. Frequency of Diagnosis



The post-operative effects like nausea, vomiting and pain were depicted in the table 2. Only 24% of the patients suffered from nausea while 18% of them had post-operative vomiting either once (10%), twice (6%) or more than twice(2%). The majority of patients (81%) did not take analgesics for post-operative pain.

Table 2. Post-operative Disturbances

Variable		Frequency	Percent
Post operative Nausea	No	37	74.0
	Yes	13	26.0
Post operative vomiting	No	41	82.0
	Once	5	10.0
	Twice	3	6.0
	More than twice	1	2.0
Post operative analgesics	No	41	82.0

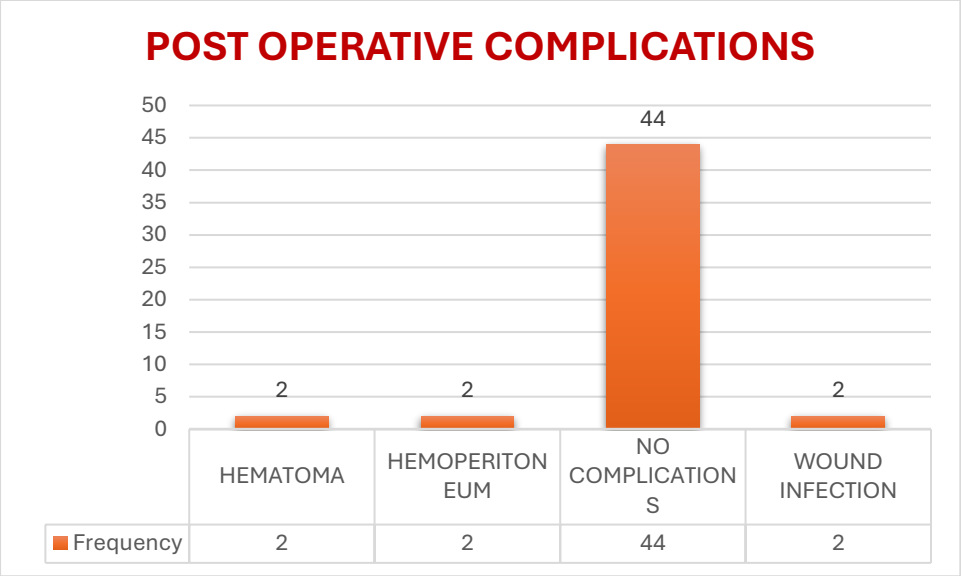
	Yes	9	18.0

Table 3. Post-operative Recovery

Post-operative Recovery	Duration
Duration of hospital stay	6 ± 1 day
Post operative hospital stays	3.7 ± 1.1 day
Post operative time for first flatus	12.5 ± 3.2 hrs
Post operative time for defecation	20.5 ± 2.6 hrs
Post operative solid intake	33.9 ± 7.2 hrs

The above table 3 showed the mean duration of the sample enrolled in the study for recovery in the post-operative period. The average duration of hospital stay was 6 ± 1 day where the post-operative period was 3.7 ± 1.1 day. The mean time taken for occurrence of first flatus after surgery was 12.5 ± 3.2 hours. About 20.5 ± 2.6 hours was the average duration for defecation in the participants post-surgery. Solid intake was taken 33.9 ± 7.2 hours following surgery in the study population.

Figure 2. Post-operative Complications



The above figure 2 portrayed the post-operative complications where the majority of patients (88%) did not experience any complications at all, while hematoma, hemoperitoneum and wound infection each was noted in 4% of them.

Table 5. Correlation between surgical procedure and post-operative complications

POST OPERATIVE COMPLICATIONS	SURGERY			Total
	Hysterectomy+ Salpingectomy	Hysterectomy+ Salpingectomy+ Oophorectomy	Radical Hysterectomy	
HEMATOMA	2	0	0	2
HEMOPERITONEUM	1	1	0	2
NO COMPLICATIONS	38	4	2	44
WOUND INFECTION	2	0	0	2
Total	43	5	2	50
P value: 0.636				

The relationship between the surgical procedure and occurrence of post-operative complications was studied in the above table 5. It can be observed that the majority of participants (88%) who had undergone hysterectomy with salpingectomy had no complications while 80% of patients who had

hysterectomy, salpingectomy and oophorectomy had no complications. In the radical hysterectomy procedure, 100% of the participants had no complications. A p value of 0.636 was observed when the type of surgery was correlated to the post-operative complications.

DISCUSSION

As the objective of this study indicated, the used of ERAS protocol in the patients undergoing abdominal hysterectomies showed overall faster recovery after surgery with fewer complications and shorter hospital stay. The guidelines for ERAS given by the ERAS protocol stated that following surgery, the intravenous fluids should be discontinued promptly, and oral intake should be started as soon as possible.[10] In accordance with that the patients were started on oral intake (33.9 ± 7.2 hours) by stopping the intravenous fluids ahead of schedule in the present study. In a meta-analysis and systemic review carried out by Lewis SJ, Andersen HK, and Thomas S (2009) comparing the early versus later oral intake in cases of abdominal surgeries, they found that earlier intake of oral feeds post-surgery resulted in decreased mortality, fewer complications following surgical procedure and shortened hospital stay.[11] In a study by Shida D et al., on 353 patients of colorectal cancer resection, the oral supplements were started 24 hours after the procedure.[12]

Another important factor in the ERAS protocol is making the patient move as soon as possible after operation. This early movement of the patient helps in earlier discharge from hospital with less complications and speedy recovery by faster return to day-to-day activities. In the current study, the mean post-procedural stay by the patients was 3.7 ± 1.1 days whereas the total length of hospital stay was 6 ± 1 day. The duration of hospital stay was assessed in relation to ambulation by Mcwilliams, David & Pantelides, K.P and their findings indicated an average stay of 5.7 days in patients who had early mobilization while those patients who stayed for long in the bed had a mean hospital stay of 12.9 days.[13] A study comparing the conventional care versus ERAS post-operatively was conducted by Yilmaz G, Akça A, and Aydin N, where eight patients were mobilized on first day post-surgery while none of the participants from the conventional group walked.[14]

The findings in the present study revealed the time to first flatus to be 12.5 ± 3.2 hours. The occurrence of flatus is an indication towards the return of bowel movements and thereby, signalling to start the feed after the operation. In a multimodal comparative study by Barboza HR, Dsilva F, Moosaba M, and Lobo AS, the experimental group that followed the ERAS regimen showed a faster bowel motility when compared to the conventional group, thereby decreasing the fasting time post-surgically and leading to a speedy discharge in the ERAS group.[15]

Only 12% of this study sample experienced post-operative complications like hematoma, hemoperitoneum and wound infection. Previous literature on the patients who followed ERAS regimen when they underwent colorectal surgery disclosed a notably lower complication rates.[16] A case-control study of 90 patients who underwent vaginal hysterectomy was studied by Relph S et al., where 15.6% of the sample in conventional care attended the emergency department post discharge due to complications while none of the participants who followed the ERAS protocol needed the emergency services.[17]

The present study had some limitations in the form of it being carried out in a single center and tertiary care hospital. Another limitation was that these patients were not followed up after their discharge post-operatively for occurrence of any other complications. The applications of this study to other health care centres may not be possible due to the smaller sample size. Other limitations include the cross-sectional design of the study and research area limited to abdominal hysterectomies without using comparison towards other abdominal surgical procedures.

CONCLUSION

The use of ERAS protocol in the patients who underwent abdominal hysterectomies helped in leading to speedy recovery with remarkably few complications as can be noted from previous literature. It also helped reduce the duration of hospital stay and improved the quality of patient care and satisfaction. This study recommends the development of more systematized procedures for providing better comfort and faster improvement in the patients undergoing surgeries. Additional studies are required to explore the benefits of using ERAS and fast track protocol on the long-term consequences on the patients.

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Conflicts of interest: There are no conflicts of interest.

Ethical statement:

Institutional ethical committee accepted this study. The study was approved by the institutional human ethics committee, Vinayaka mission's,

Kirupananda Variyar medical college and hospitals, Salem, Tamilnadu. Informed written consent was obtained from all the study participants and only those participants willing to sign the informed consent were included in the study. The risks and benefits involved in the study and the voluntary nature of participation were explained to the participants before obtaining consent. The confidentiality of the study participants was maintained.

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Authors' contributions:

Dr. Swathi C Reddy - conceptualization, data curation, investigation, methodology, project administration, visualization, writing—original draft, writing—review and editing; ***Dr Jeyamani B*** - conceptualization, methodology, writing—original draft. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work. All authors have read and agreed to the published version of the manuscript**.**

DATA AVAILABILITY:

All datasets generated or analysed during this study are included in the manuscript.

INFORMED CONSENT:

Written informed consent was obtained from the participants before enrolling in the study

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