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Optimization of Peri-Operative Hdu Care for Elective Colorectal Patients

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Abstract

Background: Despite recent advances,high-risk patients undergoing elective colorectal surgery still have significant morbidity and mortality. For patients electively admitted to level II care, premature discharge can contribute to poor outcomes.

Objectives: The main objectives were to review the level II care provided to high-risk elective colorectal patients with regards to their timing of discharge from the HDU and rate of post-operative complications, re-admissions, total length of stay (LOS) and mortality

Methods: All elective colorectal patients admitted to HDU during 2010 were included. Patients were divided into two groups with regards to their stay on HDU: Group1 ≤ 48 hrs and Group2 >48 hrs. Data regarding demographics, post-operative complications, LOS, re-admission to HDU and mortality were collected and analysed using SPSS version 14.

Results: Out of the total of 40 patients, 24 (60%) were females; the median age was 74 (IQR 45-92) years. Laparoscopic procedures were performed in 31 (77.5%) patients. There were 26 patients in Group 1 and 14 in Group 2. Post-operative complications were higher (72.2% Vs 27.8%, p-value=0.04), and the LOS was significantly longer amongst Group 1 patients [8 (IQR 4-41) Vs 6.5(IQR4-12) days, p-value 0.03). Four patients in Group 1 were readmitted to HDU compared to none in Group 2. No mortality was observed.

Conclusion: Early discharge from the HDU is associated with significant risk of complications, HDU re-admission (10%) and prolonged LOS. Ensuring a minimum HDU stay of 48 hrs could reduce post-operative morbidity, thus optimizing HDU patient care.

Keywords: Colorectal cancer; Elective surgery; HDU care; Re-admissions

Introduction

A recent report from the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) showed that only half of high-risk surgical patients received optimal care [1]. Surgery in high-risk patients represented 12.5% of interventions, but was responsible for 83.8% of observed mortality [2].

Major colorectal resections account for approximately 4% of all the elective operations in England, Wales and Northern Ireland [3]. Although the post-operative mortality for major elective colorectal cancer surgery has declined from around 5.6%to 2.4% over the past decade, the post-operative morbidity in these patients may be as high as 37.2% [2-4]. Good post-operative care can significantly reduce morbidity and mortality figures.

The Scottish Intercollegiate Guidelines Network (SIGN) provides guidance regarding the provision of post-operative care followingelective major surgical procedures. It states that the care may be provided at three levels: level Iward, level II High Dependency Unit (HDU) and level III Intensive Care Unit (ICU), depending on the patient's general condition, level of monitoring and organ support required [5].

The HDU forms an integral part of surgical care pathways since nearly all of the complicated cases are admitted either to HDU or ICU [6]. Previous NCEPOD reports have highlighted that peri-operative morbidity and mortality for high-risk cases can be reduced by elective HDU/ITU admissions, similar findings have been shown in a French study [7,8]. In the light of this guidance, the number of level II critical care beds in Englandhas increased by 91% since 1999; nevertheless, considering that the number of elective procedures has also significantly increased during the last decade, the relative increase in the critical care beds isstill very low to cater for the needs of high risk patients [9]. Premature discharge of such patients from the critical care unit has been linked with poor outcomes [10].

It has already been shown that the highest number of surgical patients (30-35%) admitted to the HDUbelong to colorectal surgery, underlying the high risk involved in this complex patient group [4,8]. Pre-existing medical conditions directly contribute to higher morbidity and mortality after major colorectal surgery [11]; the patients most at risk of death are the elderly with pre-existing medical morbidity [12,13]. Consideration should therefore be given for the routine HDU admission of high-risk patients after major colorectal surgery with the scope to reduce morbidity and mortality [3,4,9].

This study aims to review the level II care provided to high-risk elective colorectal patients with regards to timing of discharge from the HDU and rates of post-operative complications, re-admissions, total Length of Stay (LOS) and mortality.

Methods

A cross-sectional study was conducted at the Wirral University Teaching Hospital. All the elective colorectal patients admitted to the HDU during 2010 were included.

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Characteristic	Overall (n=40)	Group 1 (n=26)	Group 2 (n=14)
Age in years : mean ± SD	74.7 ± 10.6	76 .0 ± 8. 8	72.2 ± 13.4
Gender: n (%) Male Female	 16 (40%) 24 (60%)	 10 (38.5%) 16 (61.5%)	 6 (42.8%) 8 (57.1%)
Past medical history: n (%) Hypertension Diabetes Ischemic heart diseases COPD DVT	 19 (47.5%) 4 (10%) 5 (12.5%) 3 (7.5%) 1 (2.5%)	 12 (46.2%) 2 (7.7%) 3 (11.5%) 3 (11.5%) 1 (3.8%)	 7 (50%) 2 (14.3%) 2 (14.3%) 0 (0.0%) 0 (0.0%)
BMI in kg/m^2 :mean ± SD	27.6 ± 4.8	27.0 ± 5.0	28.5 ± 4.6
ASA Grade : n (%) ASA 2 ASA 3	 17 (42.5%) 23 (57.5%)	 14 (53.8%) 12 (46.2%)	 3 (21.4%) 11 (78.6%)

Table 1: Baseline characteristics.

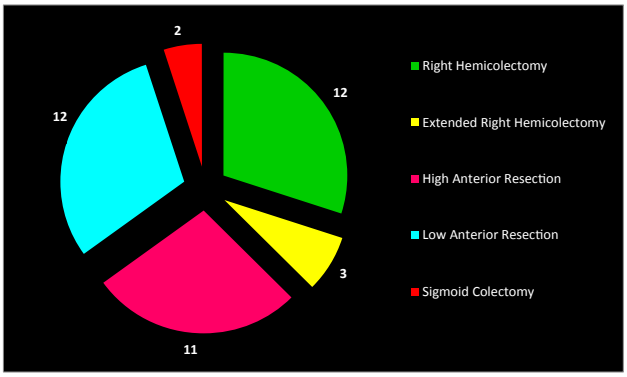

Figure 1: Details of operative procedures.

Variable	Group 1 (n=26)	Group 2 (n=14)
Type of operation: n (%) Laparoscopic Open	 23 (88.5%) 3 (11.5%)	 8 (57.1%) 6 (42.8%)
Stoma: n (%) Yes No	 9 (34.6%) 17 (65.4%)	 5 (35.7%) 9 (64.3%)

Table 2: Operative details.

Patients were divided into two groups with regards to their stay on HDU: **Group1** ≤ 48 hrs and **Group2**>48 hrs.

The patient journey was then followed till discharge from the hospital. Data on patient demographics, past medical/surgical history, diagnosis, ASA grade, surgical procedure, post-operative complications, length of HDU &total hospital stay, re-admission to the HDU and mortality were collected on a specified proforma.

The study was conducted after approval from the local audit and research and development committee of the hospital.

Descriptive statistics were computed. Mean ± Standard Deviation (SD) were reported for continuous variables having normal distribution, median and Interquartile Range (IQR) for variables having skewed distribution. Categorical variables were reported in proportions. The differenceof post-operative complications, LOS,re-admissions and mortality amongst the two groups was then compared by applying appropriate statistical tests.A p-value of < 0.05 was considered significant. The analysis was conducted in SPSS version 14.

Results

A total of 40 patients were included in this study. Group 1 consisted of 26 patients, while Group 2 had 14 patients. Median age was 74.4 (IQR 45-92) years; 60% of cases (n=24) were female (Table 1).

The commonest pathology included carcinoma of the rectum (40%), rectosigmoid junction (10%), sigmoid (12%), caecum (12%), ascending colon (10%), hepatic flexure (8%), splenic flexure (5%), crohn's disease (3%).The procedures performed are shown in Figure 1. No intra-operative complications were recorded.

The ASA grade was 2 in 42.5% (n=17) and 3 in 57.5% (n=23) patients respectively. Laparoscopic procedures were performed in 77.5% (n=31) and open surgery in 22.5% (n=9) of cases; there were no conversions from laparoscopic to open surgery. A defunctioning loop ileostomy was constructed in 35% (n=14) of cases (Table 2).

The incidence of post-operative complications was significantly higher in the Group 1 than Group 2 patients i.e.72.2% Vs 27.8% respectively (p-value=0.04) (Figure 2).

Four patients (15.4%) amongst Group 1 were re-admitted to HDU compared to none in Group 2;however, this difference was not statistically significant (p-value= 0.27). The underlying cause for re-admission was Lower Respiratory Tract Infection (LRTI) in three cases, while one patient developed LRTI and small bowel obstruction due to volvulus.

The length of stay was significantly longer amongst Group 1 (median 8 (IQR 4-41) days) than in Group 2 (median 6.5 (IQR 4-12) days) (Figure 3).

There was no mortality observed during the study.

Discussion

High-risk patients account for over 80% of mortality and morbidity after elective major surgery; despite this, fewer than 15% of these patients are admitted to critical care facilities [3]. Focusing on the immediate postoperative care of these patients with appropriate use of level II and level III care facilities seems the logical step in improving outcomes.

The majority of postoperative complications following colorectal surgery are respiratory and cardiac [4,14]; this has been confirmed in our series. Most of these adverse events occur more than 24 hours following surgery, often when the patients had already been discharged

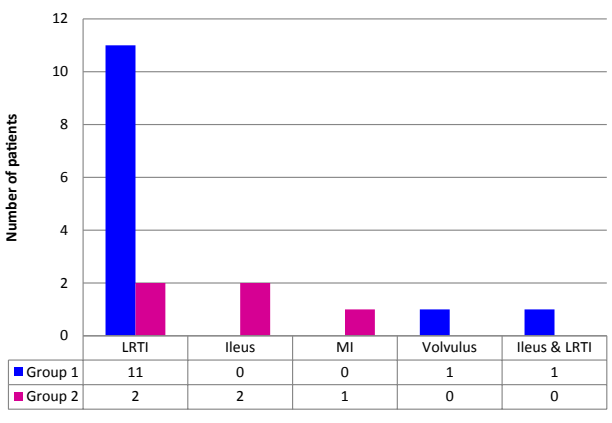

Figure 2: Post-operative complications.

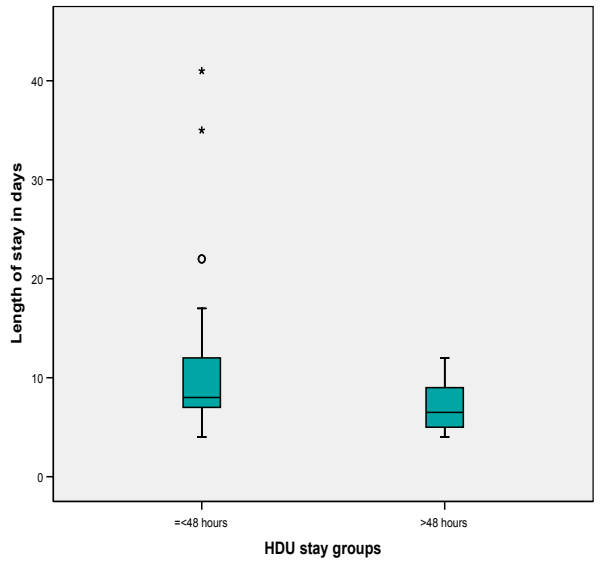

Figure 3: HDU stay & length of hospital stay.

from critical care. In the more serious cases readmission to level II and level III care becomes necessary, with these patients often experiencing worse outcomes [2,3].

In our study early discharge from the HDU led to a higher morbidity and thus worse outcome. Post-operative complications; mainly LRTI, were significantly higheramongst patients discharged from HDU within 48 hours. This, in turn, caused an increased overall LOS and led to re-admission to HDU in 10% of cases.

Daly et al. have shown that the mortality rate amongst the high risk patients can be reduced by upto 39% by preventing inappropriate discharges from the critical care unit [10,15]. Planned discharges of patients from the HDU to the general surgical ward have been suggested to result in reduced post-operative complications as well as the total LOS [16,17].

While the optimum length of HDU stay is unknown and subject to a multitude of patient- and procedure-related factors, our study suggests that a 48-hour HDU stay after major colorectal resections might be beneficial.Adopting such policy could translate into reduction of post-operative complications, LOS and re-admission rates. A shorter LOS will, in turn, lead to a reduction in the total healthcare cost [9,12]; this might, however, be at least partially offset by the higher expenditure associated with increasing the time spent in the HDU.In the present era, where there is a rift between the requirement of HDU care and its provision [18], optimization of HDU care is the key to ensure its efficiency.

The limitations of this study are obvious: there was no patient randomization, the numbers involved are small and the observed outcomes could have easily been influenced by numerous confounding factors. Conducting a Randomized Controlled Trial (RCT), however, would have posed difficult ethical problems and bias could not have been entirely eliminated whichever the chosen trial design was.

Acknowledging the above, we do not propose a blanket policy of 48-hour HDU stay for high-risk patients undergoing major colorectal resections, but highlight the importance for further research into determining the optimal timing of discharge from HDU in such cases.

Conclusion

In our cohort of high-risk patients, discharge from the HDU after less than 48 hours was associated with increased risk of complications, HDU re-admission (10%) and prolonged LOS. Ensuring a minimum HDU stay of 48 hrs could reduce morbidity thus optimizing HDU patient care.

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