

## Original Research Article

# Hospital based randomized prospective study outcomes in colorectal surgery after bowel preparation

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## ABSTRACT

**Background:** Research of so many years from the procurable world data has shown that the reasons for most colorectal cancers occur due to change in life style the type of diet, smoking as well as the influence of the surrounding environment in which man lives and increasing age with only a minority of cases associated with genetic disorders. Colorectal cancer is the third most commonly diagnosed cancer. In the first half of the 20th century, mortality from colorectal surgery often exceeded 20%, mainly attributed to sepsis.

**Methods:** The randomized prospective study was conducted on 202 colorectal cancer patients in the department of Colorectal division of General and Minimal Invasive surgery” Sher-i-Kashmir Institute of Medical Sciences, Srinagar.

**Results:** Mean age of patients in Group 1 (with no mechanical bowel preparation (NMBP)) was 51±18.15 years while as same was 50±17.76 years for Group 2 (with mechanical bowel preparation (MBP)). Age range for Group 1 was 16-87 years and 16-85 years for Group 2. Regarding outcomes, wound infections were 6.1% and 3.8% in Group 1 and Group 2 respectively. While disruption of anastomosis were 2.0% and 3.8% in group A and B respectively.

**Conclusions:** Statistically no gross difference in terms of morbidity and mortality was found between the use of mechanical bowel preparation versus no use of mechanical bowel preparation in elective colorectal surgery. Elective Colorectal Surgery can safely be performed without enduring MBP in it as it does not possess any sorts of benefits.

**Keywords:** Colorectal, MBP, NMBP

## INTRODUCTION

Research of so many years from the procurable world data has shown that the reasons for most colorectal cancers occur due to change in life style the type of diet, smoking as well as the influence of the surrounding environment in which man lives, works and increasing age with only a minority of cases associated with genetic disorders.<sup>1</sup> Not only are this, but the modern sedentary lifestyle along with imbalanced nutrition, which is low in fiber and vitamins as well as unending stress the added reasons for carcinogenesis. Carcinogenesis is a long,

complicated and incremental process. Colorectal cancer is the third most commonly diagnosed cancer and the third leading cause of cancer related deaths in the world.<sup>2</sup> Our native place Kashmir has been reported as a high incidence area of gastrointestinal cancers.<sup>3</sup> In Kashmir valley, CRC represents the third most common gastrointestinal cancer after oesophageal and gastric cancer.<sup>4</sup> In the first half of the 20th century, mortality from colon and rectal surgery often exceeded 20%, mainly attributed to sepsis.<sup>5</sup> Modern surgical techniques and improved preoperative care have significantly lowered the mortality rate. Infectious complications, however, still are a major cause of morbidity in colorectal

surgery, leading to increased cost, prolonged hospital stay, and occasional mortality.<sup>6</sup> Maunsell, in early 1890's, introduced the bowel and rectum cleansing. Since then, several methods of mechanical colon cleansing have been in practice. Mechanical bowel preparation (MBP) is used because it is considered to decrease the rate of postoperative infectious complications and morbidity which is related to septic bowel contents and its spillage during surgery and anastomotic leakage immediately resulting in infection. MBP is aimed at cleaning the large bowel of fecal content, thereby reducing the rate of infectious complications following surgery. Mechanical bowel preparation either by orthograde fluid ingestion or enema, is commonly used to prepare patients before colorectal surgery, also routinely prescribed prior to colonoscopy (screening, diagnostic, and therapeutic), in order to allow for maximal visualization of the intra luminal bowel during the procedure. The aims of this study were to find out the frequencies of wound infections, hospital stay, anastomotic leak and wound infection in patients of two cohorts underwent elective colorectal surgery.

**METHODS**

The present study was conducted on 202 colorectal cancer patients in the department of Colorectal division of General and Minimal Invasive surgery” Sher-i-Kashmir Institute of Medical Sciences, Srinagar. In this study patients attending SKIMS from August 2012 to September 2014 were included. A written informed consent was also taken from the cases. Ethical Clearance was obtained from SKIMS Ethical Committee. The study was a systematic prospective randomized hospital based study between two groups, Group-1 (cases), with no mechanical bowel (NMBP) and Group-2 (control), with mechanical bowel preparation (MBP). Randomization was done with the help of random number table by assigning serial number to all colorectal cancer patients, and patients were distributed blindly into two groups; patients who got odd numbers were kept in a preparation group (control) and the patients who got even numbers were allotted to non-preparation group (cases) by a designated staff nurse. The patients in the preparation group received oral MBP by using two packs of polyethylene glycol in four liters of water over four hours, 12-16 hours before elective surgery. While, BP, Pulse rate, urine output and serum electrolytes before and after preparation was monitored. On the other hand, low residue diet was allowed until midnight the evening before surgery in patients with no preparation.

**Statistical analysis**

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were summarised in the form of means and standard deviations. Chi-square test was applied for comparing categorical variables.

**RESULTS**

The present study was conducted on two hundred two patients who underwent for colorectal surgery. In this study are shown with their basis characteristics of demographics, age, gender in Table 1.

**Table 1: Age and gender distribution.**

Variable	Case (n=98) N (%)	Control (n=104) N (%)	P value	
<b>Age (years)</b>	≤30	12 (12)	14 (13)	0.69 (NS)
	31 to 45	16 (16)	15 (14)	
	46 to 60	39 (40)	43 (41)	
	61 to 75	26 (27)	29 (28)	
	>75	5 (5)	3 (3)	
	Total	98(100)	104 (100)	
	mean± SD	51±18.15 (16.87)	50±17.76 (16.85)	
<b>Gender</b>	Male	56 (57)	57 (55)	0.73
	Female	42 (43)	47 (45)	

**Table 2: Post-operative complications.**

Post-operative complications	Case (n=98) N (%)	Control (n=104) N (%)	P value	
<b>Surgical</b>	Urinary retention	4 (4.1)	6 (5.8)	0.58 (NS)
	Abdominal collection	5 (5.1)	7 (6.7)	0.62 (NS)
	Anastomotic leak	2 (2.0)	4 (3.8)	0.45 (NS)
	Wound infection	6 (6.1)	4 (3.8)	0.45 (NS)
<b>Medical</b>	Chest infection	6 (6.1)	8 (7.7)	0.66 (NS)
	UTI	7 (7.1)	9 (8.7)	0.69 (NS)
	Septicemia	2 (2.0)	3 (2.9)	0.69 (NS)
<b>Total number of complications</b>	32 (32.6)	41 (39.4)	0.31 (NS)	

There were comparable results between two groups in terms of post-operative surgical and medical complications, wound infection were 6.1% and 3.8% in Group 1 and Group 2 abdominal collection 5.1% and 6.7%, urinary retention 4.1% and 5.8% were noted in both groups. While anastomotic leak was 2.0% and 3.8% in Group 1 and Group 2 respectively. Among the medical complications chest infection were more common 6.1% and 7.7%, however no significant statistical difference was found in post-operative complications in Table 2. There was no remarkable difference in post-operative length of hospital stay in both groups. Overall

complication rate in the non-preparation group was 32.6% while it was 39.4% in the preparation group.

## DISCUSSION

Historically, the infection is the most common risk factor in health outcomes of surgery in general and colo-rectal in particular, with reason that high bacterial load in contents of feces come in contact with newly performed anastomosis, and at this fear called for pre-operative mechanical bowel preparation in surgical practice since last five decades.<sup>7</sup>

Out of 98 patients in Group-1, 56 (57%) were males and 42 (43%) were females. In the group-1 minimum age was 16 years and maximum age was 87 years with a mean age of 51±18.15 years. In terms of mean age present study was comparable to studies conducted by Saha et al, Delaney et al, Teeuwen et al, Bhat et al and Javid et al.<sup>8-12</sup> In present study no statistically significant difference was found in wound infections in patients having no MBP (6.1%) and having MBP (3.8%), the same inference is drawn by many studies in medical literature in terms of wound infection (SSI'S) our study was in concordance with the study conducted by Brownson et al 1992 and Fillmann et al 1995.<sup>13,14</sup> The study conducted by Brownson et al, demonstrated that wound infection was seen 5.8% and 7.5% in control and cases respectively.<sup>13</sup> The similar findings were reported by Caroline et al.<sup>15</sup> In case of medical complications urinary tract infection and chest infection were most common, 7.1% and 6.1% each respectively. On the other hand in Group-2 (with MBP) among surgical complications the most common complication was abdominal collection (6.7%) followed by urinary retention (5.8%), wound infection and anastomotic leak were (3.8%) each.

In terms of medical complications in Group-2 (with MBP) again urinary tract infection (8.7%) and chest infection (7.7%) were most common. In terms of anastomotic leak our study is in concordance with the study conducted by Zmora et al and Miettinen et al.<sup>16,17</sup> In the study conducted by Zmora et al the anastomotic leak was 3.7% in preparation group and only 2.1% in patients without preparation (p-value=0.33).<sup>16</sup> Similarly the study conducted by Miettinen et al it was 3.6% in control group and 2.3% in cases.<sup>17</sup> In case of abdominal and pelvic collection our study was in close concordance with the study conducted by Memon M.A et al.<sup>18</sup> Their showed that 2.7% were having abdominal and pelvic collection from Group-1 (without MBP) and 7 % from Group-2 (with MBP). On the other hand in our study it was 5.1% in Group-1 (without MBP) and 7 % in Group-2 (with MBP).

## CONCLUSION

In present study statistically no gross difference in terms of morbidity and mortality was found between the use of mechanical bowel preparation versus no use of

mechanical bowel preparation in elective colorectal surgery. Elective colorectal surgery can safely be performed without enduring MBP in it as it does not possess any sorts of benefits.

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