ORIGINAL ARTICLE

Comparison of mean hospital stay and mean time for first passage of first flatus in patients having post-operative nasogastric intubation with no intubation after small bowel anastomosis

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Abstract

Introduction: Abdominal surgeries or laparotomies are standard procedures for the treatment of different acute gastrointestinal pathologies and gastric decompression is commonly used before the majority of such surgeries. Nasogastric tubes are commonly used in the normal routine of abdominal surgeries and to achieve normal bowel function it is kept post-operatively as well for at least a couple of days. Several surgeons prefer to employ gastric decompression as they consider that it can decrease the incidence of side effects of surgeries such as post-operative ileus, nausea, aspiration, vomiting, and anastomotic leakage. We recommend no nasogastric intubation after small bowel anastomosis as the mean hospital time and stay for passage of first flatus was less compared to the intubated group and also it does not affect the prevention of intestinal anastomotic leak.

Objective: To compare mean hospital stay and mean time for passage of first flatus between post-operative nasogastric intubation with no intubation after small bowel anastomosis.

Material and Methods: This Randomized controlled trial was conducted at departments of surgery in Lady Reading Hospital and Mercy Teaching Hospital Peshawar from 1st July 2020 to 30th June 2021 as part of an endeavor to do an RCT and included cases operated both in the government and private sector i.e., Lady Reading Hospital Peshawar and Mercy Teaching Hospital Peshawar. In this study, a total of 60 patients in each group were observed. All patients were randomly allocated into two groups by the Lottery method. Patients in group A were not subjected to post-operative nasogastric intubation while patients in group-B were subjected to post-operative nasogastric intubation for 24 hours.

Results: Our study shows that in group-A (Non-nasogastric intubation) mean age was 42 years with SD±0.76, whereas in group-B (nasogastric intubation) mean age was 44 years with SD±9.11. In group-A (Non-nasogastric intubation) 55% of patients were male and 45% of patients were female. Whereas in group-B (Non-nasogastric intubation) 52% of patients were male and 48% of patients were female. Group-A (Non-nasogastric intubation), mean hospital stay was 4 days±3.12 and the meantime to pass first flatus was 38 hours±7.42. Where as group-B (nasogastric intubation), mean hospital stay was 7 days±2.91 and the meantime to pass first flatus was 42 hours±8.57.

Conclusion:We concludes that mean hospital stay and mean time to pass flatus is less with no nasogastric intubation compared to nasogastric intubation after small bowel anastomosis.

Keywords: Mean hospital stay, mean time to pass flatus, nasogastric intubation, no intubation, small bowel anastomosis.

Received
Date:15th September, 2021
Accepted
Date: 15th June, 2022

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Introduction:

Abdominal surgeries or laparotomies are standard procedures for the treatment of different gastrointestinal pathologies and gastric decompression is commonly used before the majority of such surgeries. Nasogastric tubes are commonly used in the normal routine of abdominal surgeries and to achieve normal bowel function it is kept post-operatively for at least a couple of days.[1]

Several surgeons prefer to employ gastric de-

compression as they consider that it can decrease the incidence of side effects of surgeries (post-operative ileus) such as nausea, aspiration, vomiting, and anastomotic leak.[2] Hence reducing side effects eventually shortens the duration of stay in hospital by increasing treatment efficacy and normalizing bowel function.[3] Contrary to this, wound complications that can cause infection, atelectasis caused by pulmonary complications, and other complications like aspiration and abdominal discomfort (Nausea, vomiting, abdominal distention) are not prevented leading to no improvement in treatment efficacy and hence failure to improve bowel function in a relatively short duration of hospital stay.[4] The absence of a nasogastric tube did not have any effect on the incidence of the anastomotic leak or post-operative wound dehiscence.[5]

Post-operative nasogastric decompression was introduced by Levin's in 1926 and intended to drain secretions and gas from the upper gastrointestinal tract, thereby reducing vomiting, abdominal distension, and abdominal discomfort, to prevent anastomotic leak and wound dehiscence.[6] But prolonged nasogastric intubation is associated with complications like basal atelectasis due to poor cough reflex, aspiration pneumonia, nasal septum necrosis, and derangement of electrolytes. Hence, reserved solely for specific indications.

Therefore, any advantages related to normal nasogastric decompression employed routinely after removal of the bowel are no longer preferred in the modern era of surgery that supports evidence-based procedures. The same is the case with prolonged enteralrestriction employed after removal of bowel.[8]

In one study, the meantime to pass the flatus in patients without Nasogastric tubes was less (46.19±9.48 hours) as compared to patients with Nasogastric Tubes (49.2±7.9 hours).[9] In another study, the mean hospital stay in group-A (ileostomy reversal without nasogastric tube) was 5.39±2.51 days while in group-B (ileostomy reversal with nasogastric tube) was 8.53±3.78 days.[10]

The present study is comparing post-operative nasogastric intubation with no intubation among patients subjected to small bowel anastomosis. The idea behind doing this study in our setup came after doing a thorough literature search and finding that the nasogastric intubation practices vary from one setting to another. Moreover, one surgeon prefers intubation and the other does not base on his/her personal experiences. Currently, the literature is very limited in terms of the comparison of intubation vs no intubation and there is no solid evidence to favor any of these two after abdominal surgeries, particularly after intestinal anastomosis.

Material and Methods:

This Randomized controlled trial was conducted at Departments of Surgery in Lady Reading Hospital and Mercy Teaching Hospital, Peshawar from 1st July 2020 to 30th June 2021 as part of an endeavor to do an RCT after getting approval from the ethical committee of both institutes.

Sample size: The sample size was 60 in each group keeping the following values from the study; Mean hospital stay in group-A was 5.39± 2.51 days while mean hospital stay in group-B was 8.53±3.76 days. Confidence level: 95%, Power of the test: 80%

Sampling technique: Consecutive (non-probability) sampling

Sample selection: Inclusion criteria includes all patients are scheduled for small bowel anastomosis irrespective of indication. There ages in between 15 years to 65 years. Sex: both male and female. ASA Grade I and II. Exclusion criteria includes patients with steroid intake in the last one week. Patients with diabetes on history and medical records. Patients with a history of gastrectomy. Immuno-compromised patients

The above-mentioned conditions act as confounding factors

Data collection procedure: The study was conducted after approval from the ethical commit-

Table 1: Age distribution (n=120)

Age	Group A	Group B	*P-Value
15-30 years	11(18%)	10(17%)	
31-65 years	49(82%)	50(83%)	
Total	60(100%)	60(100%)	
Mean and SD	42±10.76	44±9.11	0.2741

**Student T-test was applied in which P-value*

Group A: Non nasogastric intubation

Group B: Nasogastric intubation

Table 2: Gender distribution (n=120)

Gender	Group A	Group B	*P-Value
Male	33(55%)	31(52%)	0.7143
Female	27(45%)	29(48%)	
Total	60(100%)	60(100%)	

**chi-square test was applied in which P-value*

Group A: Non nasogastric intubation

Group B: Nasogastric intubation

tee. The patients included in the study were directly admitted from the OPD who were scheduled for small bowel anastomosis irrespective of indication. The purpose, risks, and benefits of the study were explained to all included patients, they were assured that the study was purely conducted for research and data publication, and informed written consent was obtained from all included patients.

All patients were randomly allocated into two groups by the Lottery method. Patients in group A were not subjected to postoperative nasogastric intubation while patients in group B were subjected to post-operative nasogastric intubation for 24 hours. All these patients were prepared for surgery 2 to 3 hours after admission. Pre-operative resuscitation included intravenous fluids, intravenous antibiotics, and correction of electrolyte imbalance, etc., as indicated. Adequate urine output, normal serum electrolytes, and urea were included as indicators of adequate resuscitation.

All the procedures were performed by a single experienced general surgeon in each institute-with having a minimum of 5 years of experience. Post-operatively all patients were kept in the ward under observation and continuous monitoring of all the patients was done to measure the hospital stay and time to pass flatus.

All the above information was recorded in a predesigned proforma including name, age, sex, and contact address. Exclusion criteria were followed strictly to control confounders and bias in the study results.

Data analysis procedure: All the data were analyzed in SPSS 20.0. Mean±standard deviations were calculated for continuous data like age, BMI, hospital stay (days), and time to pass flatus (hours). Frequencies and percentages were calculated for categorical data like gender indication of anastomosis. Outcome (Mean hospital stay and time to pass flatus) was compared using an independent t-test. Outcome (mean hospital stay and time to pass flatus) was stratified among age, gender, indication for anastomosis, and BMI to see the effect modifiers using an independent t-test with a p-value of < 0.05 as significant. All the results were presented as tables and charts.

Results:

In this study age distribution among two groups was analyzed as in group-A (Non-nasogastric intubation) 11(18%) patients were in the age range 15-30 years and 49(82%) patients were in the age range 31-65 years. The mean age was 42 years with SD±10.76. Whereas in group-B (nasogastric intubation) 10(17%) patients were in the age range 15-30 years and 50 (83%) patients were in the age range 31-65 years. The mean age was 44 years with SD±9.11 as shown in table-1.

Gender distribution among two groups was analyzed as in group-A (Non-nasogastric intubation) 33(55%) patients were male and 27(45%) patients were female. Whereas in group-B (Non-nasogastric intubation) 31(52%) patients were male and 29(48%) patients were female as shown in table-2

BMI distribution among two groups was analyzed as in group-A (Non-nasogastric intubation) 43(72%) patients had BMI ≤25 Kg/m^2 and 17(28%) patients had BMI > 25 Kg/m^2. Mean BMI was 25 Kg/m^2 with SD±3.59.

Table 3: Indication of anastomosis (n=120)

Indications	Group A	Group B	*P-Value
Enteric perforation	41(69%)	40(67%)	0.8454
Trauma	19(31%)	20(33%)	
Total	60(100%)	60(100%)	

**chi-square test was applied in which P-value*

Group A: Non nasogastric intubation

Group B: Nasogastric intubation

Table 4: Outcome (n=120)

Outcome	Group A Mean and SD (n=60)	Group B Mean and SD (n=60)	*P-Value
Mean hospital stay (days)	4 ± 3.12	7 ± 2.91	0.0001
mean time to pass flatus (hours)	38 ± 7.42	42 ± 8.57	0.0072

**Student T-test was applied in which P-value*

Group A: Non nasogastric intubation

Group B: Nasogastric intubation

Whereas in group-B (nasogastric intubation) 45(75%) patients had BMI ≤25 Kg/m^2 and 15(25%) patients had BMI > 25 Kg/m^2. Mean BMI was 25 Kg/m^2 with SD±2.88.

Indication of Anastomosis among two groups was analyzed as in group-A (Non-nasogastric intubation) 41(69%) patients had enteric perforation and19(31%) patients had trauma. Whereas in group-B (nasogastric intubation) 40(67%) patients had enteric perforation and 20(33%) patients had trauma. (table No 3)

The outcome among two groups was analyzed as group-A (Non-nasogastric intubation) mean hospital stay was 4 days±3.12 and the mean-time to pass flatus was 38 hours±7.42. Whereas group-B (nasogastric intubation) mean hospital stay was 7 days±2.91 and the mean time to pass flatus was 42 hours±8.57. (Table No 4)

Discussion:

Since the introduction of the nasogastric tube by Levin in 1921, its use has remained relatively unchallenged.[29] In 1926, McIver demonstrated that post-operative distension is a result of swallowed air and could be prevented by the nasogastric tube.[30] This dictum remained essentially unchallenged until 1963 when Gerber[31] stated that routine use of nasogastric decompression after surgery was not only unnecessary but was also accompanied by complications specifically related to its use. However, an American College of Surgeons publication on pre-and post-operative care stated that "intestinal decompression with a nasogastric tube is required after resection and anastomosis of gastrointestinal tract.[32]

Our study shows that in group-A (Non-nasogastric intubation) mean age was 42 years with SD±10.76. Whereas in group-B (nasogastric intubation) mean age was 44 years with SD±9.11. In group-A (Non-nasogastric intubation) 55% of patients were male and 45% of patients were female. Whereas in group-B (Non-nasogastric intubation) 52% of patients were male and 48% of patients were female. Group-A (Non-nasogastric intubation) mean hospital stay was 4 days±3.12 and the mean time to pass flatus was 38 hours±7.42. Whereas group-B (nasogastric intubation) mean hospital stay was 7 days ± 2.91 and the mean time to pass flatus was 42 hours ± 8.57.

Our results correlated with another study carried out by Haroon M et al in which there was a total of 180 patients, 90 in each group. The mean age of the patients was 45.17±11.94. 86(47.8%) patients were males and 94(52.2%) patients were females. 30(16.7%) patients with Billroth-I gastrectomy, 25(13.9) with Billroth-II gastrectomy, 72(40%) with small bowel anastomosis, and 53(29.4%) with large bowel anastomosis were included in this study. 103(57.2%) surgeries were done in less than 3 hours and 77(42.8%) in more than 3 hours. The mean time to pass the flatus in patients without Nasogastric tubes was less (46.19±9.48 hours) as compared to patients with Nasogastric Tubes (49.20±7.90 hours) with a P-Value of 0.02 which is a statistically significant and supports the hypothesis.[11]

Our results correlated with another study carried out by Aziz M et al in which the age range in this study was from 20 to 50 years with a mean age of 29.63±8.58 years. The mean age of patients in group-A was 29.44±8.28 years and in group-B was 30.12±9.09 years. The majority of

the patients 23 (38.33%) were between 31 to 40 years of age. Out of 60 patients, 41 (68.33%) were males and 19 (31.67%) were females with a male to female ratio of 2.16:1. Mean hospital stay in group-A (ileostomy reversal without nasogastric tube) was 5.39±2.51 days while in group-B (ileostomy reversal with nasogastric tube) was 8.53±3.78 days.[12]

After a few studies on the role of nasogastric decompression after colonic surgery, many surgeons have stopped routine use of nasogastric decompression after colorectal surgery but are still using it after small bowel surgery.[12] Few studies are published to find out the value of prophylactic nasogastric decompression after small bowel surgery. Mean hospital stay in group-A (ileostomy reversal without nasogastric tube) was 5.39±2.51 days while in group-B (ileostomy reversal with nasogastric tube) was 8.53±3.78 days (p-value<0.0001). Qureshi et al have shown a significant difference in mean hospital stay between ileostomy reversal with nasogastric (NG) tube and without nasogastric tube i.e. 8.1±4.4 days versus 5.7±1.4 days respectively. The problems combined with the discomfort and restrictions in mobility led several to support a selective approach to using the post-operative nasogastric tubes.[13]

The necessity of nasogastric decompression following elective abdominal surgery has been increasingly questioned over the last several years. Many clinical studies have suggested that this practice does not provide any benefit but could lengthen the hospital stay, in addition to patient discomfort and respiratory complication.[14-16] In a meta-analysis in 1995, Jottard et al have compared selective versus routine NG decompression after elective laparotomy which does not support the prophylactic use of NG tube.[17] In July 2004, the Cochrane database of the systemic review published the results of their systematic review and concluded that the routine nasogastric decompression should be abandoned in favor of selective use of the NG.[18] Colvin et al in randomized controlled trials have concluded that there is no extra benefit of placing nasogastric tube.[19] Rancette et al and Wolf BG et al in their studies have shown no significant difference in post-operative hospital stay in patients with and without NG tube placement.[20,21] The shorter post-operative stay could be partly attributed to the earlier return of bowel function and advancement of diet. Several studies have shown that time to return of bowel function and oral intake was the same or sooner in the patients without a nasogastric tube.[22,23] In a randomized controlled trial done by Khan et al has found the length of hospital stay was 7.93±1.27 days in patients with nasogastric tube placement versus 6.54±0.85 days in patients without NG tube placement[24] Nelson R et al study showed the prolongation of duration to return of bowel sounds thus increasing stay of the patient in hospital.[25] Some studies show this duration to be substantially significant in those with a nasogastric tube; possibly due to decreased or delayed ambulation.[26] Wu CC et al have also found shorter hospital stays in patients without nasogastric tube placement.[27] The length of stay in both groups was similar as seen in a study by Reissman et al.[28] Its use shows no significant benefit in reducing the duration of ileus. On the whole, it is concluded that mean hospital stay is shorter after ileostomy reversal without nasogastric tube placement compared with nasogastric tube placement.

Conclusion:
Our study concludes that mean hospital stay and mean time to pass flatus is less with no nasogastric intubation compared to nasogastric intubation after small bowel anastomosis.

Conflict of interest: None

Funding source: None

Role and contribution of authors:
Muhammad Faisal Khan, conception and acquisition of data, critical revision and final approval.

Sheikh Muhammad Ibqar Azeem, conception and acquisition of data, drafting the manuscript and literature Search

Aftab Hussain, acquisition of data and literature

search

Muhammad Kaleem, analysis of data, critical revision

Muddasar Shahzad, drafting the manuscript and literature search

Muhammad Zeeshan, literature search

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