

Study of Patients with Early Postoperative Complications Following Abdominal Surgery Admitted into Rajshahi Medical College Hospital.

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Abstract

Background: Postoperative complications are a significant source of morbidity and mortality. The rising cost of health care is given increasingly importance worldwide. A major factor affecting hospital cost is complications following surgery. Each of the postoperative complications are associated with substantial increases in total hospital cost, financial burden of both government and people and increases in work load for doctors and other health related staffs even after adjusting for type of surgery, urgency of surgery and preoperative patient comorbid conditions. **Aim of the study:** To study the incidence of admission of patients with early postoperative complications following abdominal surgery in RMCH. **Methods:** The study was a prospective observational study and conducted on Department of Surgery, Rajshahi Medical College Hospital, from March, 2013 to August, 2013. The cases were selected on the basis of history, clinical findings, relevant investigations, exploration of abdomen and histological confirmation (in selected cases). All patients more than 12 years old with early postoperative complications following abdominal surgery admitted into general surgery department of RMCH. 96 Cases with early postoperative complications following abdominal surgery admitted in surgery department during this study period. Purposive sampling technique used. Results were presented by appropriate table and graphs, data was analyzed by SPSS version 15. **Result:** A total of 96 out of 3613 (that is 2.66%) cases of postoperative complications were admitted during the period of study. The mean age was 39.44 years (14years-70years) with the male to female ratio of 1:1.4. Peak age group of postoperative complications is 21-30 years about 28.1%. The major incidence of postoperative complications after abdominal surgery among admitted patients are wound infection (10.4%), Pyoperitoneum (9.4%), Pelvic abscess (8.3%), Fecal fistula (8.3%), Burst abdomen (7.3%), Missed diagnosis (7.3%) and Sub hepatic abscess (6.2%). The mortality rate was 7.3% (n= 7). **Conclusion:** Patients with postoperative complications consume considerably more health care resources. Initiatives that target prevention of these events, even if costly to implement would significantly improve quality of care and patient safety.

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INTRODUCTION

Postoperative complications are a significant source of morbidity and mortality¹. The rising cost of health care is given increasingly importance worldwide. A major factor affecting hospital cost is complications following surgery.² Each of the postoperative complications are associated with substantial increases in total hospital cost, financial burden of both government and people and increases in work load for doctors and other health related staffs even after adjusting for type of surgery, urgency of surgery and preoperative patient comorbid conditions.¹ Admitted patients with postoperative complications in the tertiary level hospital are not uncommon in our country. Most of them admitted with early complications. In general the incidence of postoperative complications is related directly to the preoperative condition of the patient and the magnitude of the surgical procedure, and inversely to the extent of the preoperative preparation and care.³ Arrangement of operation theatre complex in hospitals or clinics, proper sterilization and utilization of the surgical equipment, surgical expertise, surgical judgment and operative decision making, the nature and site of the disease for which surgery was performed are also important.³ The interactions of individual patient's

biology with a disease process, sophistication of the health care providers managing the patient, the avoidance of unnecessary investigations or procedures, the optimization of the patient's physiologic functions and the efficient and meticulous management of tissues during procedures are vitally important in avoiding surgical complications.⁴ The likelihood of developing post-operative complications are depend on age, general condition of the patient, presence of other co-morbidity, type and duration of anesthesia, surgical site, urgency of the procedure and soon. Associated other factors are skill and experience of the surgeon, aseptic precaution of surgical team, standard and aseptic environment the operation theatre complex, optimal management of patients throughout the postoperative phase etc. Experience of surgeon is dependent on training, repetitions (learning curve) and on case load of the surgeon and of the hospital. The learning curve demonstrates the progress in mastering a new surgical technique and is completed when the monitored parameters reach a steady state. In most studies these monitored parameters are operating time, intra- and postoperative complications, days to discharge, overall morbidity and mortality.⁵ The choice of incision for abdominal surgery depends on the area that needs to be exposed, the elective or emergency nature of the operation and



the personal preference. The transverse incision seems to be associated with fewer early postoperative complications (mainly pain and pulmonary morbidity) and lower incidence of late incisional hernia. However, abdominal or neural dysfunction after transverse access because of nerve, muscle or vessel interruption.^[5] A midline incision is still the incision of choice in conditions that require rapid intra-abdominal entry or where the preoperative diagnosis is uncertain, as it is quicker and can easily be extended.^[6] It is established that the incidence of postoperative complications is highest for emergency procedure, intermediate for urgent operations and lowest for elective or planned intervention.^[3] So to prevent the postoperative complications patients need proper preoperative care, management of co-morbidity, application of proper technique of surgery, use of anaesthesia at the lightest possible degree, assurance of meticulous haemostasis and adequate postoperative care.^[7] In general, complications can be divided into intraoperative and postoperative complications⁵. The postoperative period can again be divided into three phases; (1) an immediate or post-anaesthetic phase; (2) an intermediate phase; (3) a convalescent phase. The first two phases encompassing the hospitalization period. The convalescent phase is a transition period from the time of hospital discharge to full recovery.^[8] The early postoperative period can purposively be defined as the time from awakening after surgery until discharge from hospital.^[9] So the early postoperative period encompass

the immediate and intermediate phases of postoperative period. But the highest incidence of post-operative complications is between 1 and 3 days after the operation.^[10] The early postoperative complications following abdominal procedures are mostly pulmonary complications, surgical site complications, intra peritoneal complications, urinary complications and pelvic collection (abscess). Pulmonary complications are atelectasis, pneumonia, aspiration pneumonitis and acute respiratory distress syndrome. Surgical site complications are seroma, haematoma, wound infection, wound dehiscence, burst abdomen etc. Infectious complications are the main causes of postoperative morbidity in abdominal surgery.^[12] Surgical site infections can have a significant effect on quality of life for the patient. They are associated with considerable morbidity and extended hospital stay. Intra peritoneal complications are haemoperitoneum, pyoperitoneum (An accumulation of pus in the peritoneal cavity), intestinal obstruction, anastomotic failure, paralytic ileus, injury to intra-abdominal viscera and presence of foreign body (surgical instruments) in the abdomen. Urinary complications are clot retention, urinary retention, urinary fistula, dyselectrolytemia, renal failure etc¹¹. Major systemic complications include myocardial infarction, congestive heart failure, hypotension, pulmonary embolism, respiratory failure, renal failure, fecal fistula and sepsis.^[13] In our perspective various types of abdominal operation are being done in primary and secondary level

hospitals and private clinics where there is lack of specialist or trained surgeon and trained anaesthetist. In some extent postoperative morbidity is related the type of anaesthesia used, duration of anaesthesia, experience of anaesthetist and the surgery itself but the procedure is generally the most important predictor of complications. Many facilities in our country have poor diagnostic capabilities or none at all. Laboratory, histological, and radiological facilities are only available on a limited basis. Equipment for carrying out anaesthesia and surgery is often deficient, and facilities for sophisticated postoperative care are frequently minimal and dependent on the individual initiative of the surgeons concerned. Insufficient beds, shortages of surgical supplies, and inefficiency in operating theatres often dictate that only limited urgent or emergency surgery can be performed. But many elective procedures are also being done in this setup that contributes increased rate of complications. The early postoperative complications following abdominal surgery are potentially life threatening and needs proper management to recovery. To reduce these complications, it is important to establish the risk factors that increase their incidence using multivariate analysis. And for this, identification of the complication, classification of the severity of complication, expertise of the managing capacities is needed. Due to limitation of resources, appropriate clinical assessment and monitoring in the primary and secondary health care center to manage these complications

they are often admitted into tertiary level hospitals.

OBJECTIVES

General objectives:

- The incidence of patients admitted with early postoperative complications following abdominal surgery in RMCH has been studied.

Specific objectives:

- The incidence of complications after operation one by specialist and non-specialist surgeon was compared.
- The risk factors influencing the postoperative complications in primary and secondary level health care central have been found.
- The postoperative complications were classified according to severity.
- The major medical and surgical complications after index operation were studied.

MATERIALS & METHODS

The study was a prospective observational study and conducted on Department of Surgery, Rajshahi Medical College Hospital, from March, 2013 to August, 2013. The cases were selected on the basis of history, clinical findings, relevant investigations, exploration of abdomen and histological confirmation (in selected cases). All patients more than 12 years old with early postoperative complications following abdominal surgery admitted

into general surgery department of RMCH. 96 Cases with early postoperative complications following abdominal surgery admitted in surgery department during this study period. Purposive sampling technique used. Results were presented by appropriate table and graphs, data was analyzed by SPSS version 15.

Inclusion criteria:

- All patients admitted into RMCH with early postoperative complications following abdominal surgery
- All patients more than 12years of age.
- All patients which are developed complications with in early postoperative period.
- All patients operated as a missed diagnosis.

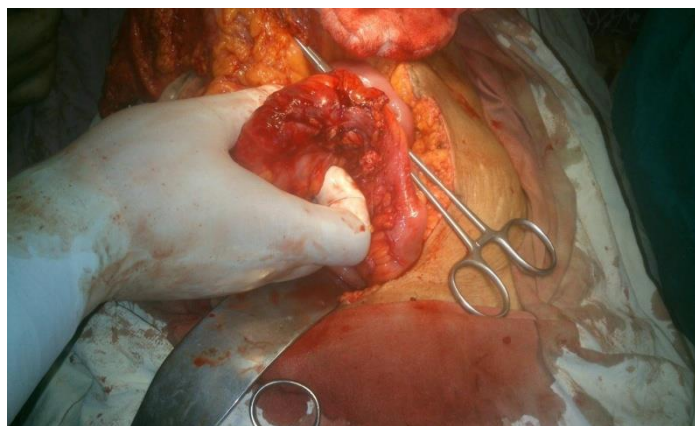
Exclusion criteria:

- Patients of age less than or equal to 12 years.

- Patients with complications beyond early postoperative period following abdominal surgery.
- Patients with complication following procedures other than abdominal surgery.
- If the admission is a planned aspect of their postoperative course.
- Patients developed postoperative complications following abdominal surgery done in RMCH.

Surgical procedure and follow up:

Missed diagnosis can be defined as the lack of a diagnosis, usually leading to no, or inaccurate treatment. There are various reasons for missed diagnosis or diagnostic error of a patient including errors by doctors, specialists, and laboratory tests. The patient can also contribute to an error in various ways. Conditions for which a person never seeks medical advice are also a common type of misdiagnosis.



Figure—2.1: Ca. Caecum. Patient was operated as a missed diagnosis of acute appendicitis.



RESULTS

A total number of 96 (Ninety six) out of 3613 patients with a mean age of 39.44 years (Std. Deviation of 15.180) and a range of 14-72 years admitted into Rajshahi medical college hospital with postoperative complications following different types of abdominal surgery during a period of 6 (six) months were included in this study. The incidence of postoperative complications among admitted patients were 2.66%. Males constituted 41.25% (n=40) of the study population and females, 58.75% (n=56). The age group of most of the patients is 21-30 years (28.1%) among the study population. And the second most common age group is 31-40 years (25.0%). It means the younger age group of population are the main victim. Most of the early complications are developed within first week after operation. Within 0-3 days the incidence is 20.8% and 4-7 days the incidence is 60.4%. A total of admission rate with post-operative complications after various type of abdominal surgery is 81.2% (20.8%+60.4%). 18.8% patients were admitted with Grade-I complication, 11.5% Grade-II, 25.0%, Grade-IIIa, 29.2% Grade-IIIb, 6.2% Grade-IVa, 2.1% Grade-IVb and 7.3% were Grade-V. So the mortality rate is 7.3% of the study population. 78.1% patients were with major complications of different system. Most of the mare with fecalfistula (10.4%) of gastrointestinal system and

Respiratory failure (3.1%) of respiratory system.

79.2% (n=76) patients could be managed in surgery department with the help of Transfusion medicine, Anaesthesia and medicine department. 19.8% (n=19) patients were transferred to other discipline like ICU, Nephrology, Cardiology and Respiratory medicine department. And 1.0% (n=1) patient was referred to higher special center for better management. 40.6% (n=39) patients were managed conservatively. 59.4% (n=57) patients were needed reoperation and 19.8% (n=19) patients developed further complication. Depending upon the underlying pathology various treatment modalities were adopted, ranging from conservative measures, Blood transfusion and ICU management after operation where indicated. After admission in RMCH most of the patients need 2-4 weeks more hospital stay. Of the total number of patients, 83 (83.3%) recovered completely while 9 patients disabled and 7 patients were died. There was an overall mortality of 7.3%. Mortality was high in patients who were suffered from major complication and underwent major surgery. Total admission of patient in surgery department of RMCH from April-2013 to September-2013 was 3613. Out of them, 96 cases were admitted with early postoperative complications (2.66%).



Table-1: Age incidence, Duration between index operation and development of complication (N= 96)

Age (Years)/Days	Number of patients	Percentage (%)
Age incidence		
20-Dec	7	7.29
21-30	27	28.13
31-40	24	25.00
41-50	12	12.50
51-60	13	13.54
61-70	12	12.50
>70	1	1.04
Total	96	100.00
Duration between index operation and development of complication		
0-3	20	20.83
4-7	58	60.42
8-14	15	15.63
15-30	3	3.13
Total	96	100.00

Table-2: Incidence of different types of index operation (N= 96)

System	Name of operation	Number of cases	Percentage (%)	Total
Incidence of different types of index operation				
GIT	Appendicectomy	26	27.08	38.54
	Resection & anastomosis of gut	5	5.21	
	GIT Perforation repair	6	6.25	
HB & PS	Cholecystectomy	11	11.46	11.94
Renal	Prostatectomy	6	6.25	10.42
	Removal of renal stone	4	4.17	
Gynae & Obs	VH	9	9.38	32.29
	TAH	8	8.33	
	LUCS	12	12.50	
	Tubectomy	2	2.08	
Others	Herniotomy & Herniorrhphy or	5	5.21	7.29



	Multiple operation	2	2.08	
	Total	96		100

Table-3: Type & Duration of anaesthesia used for index operation (N=96)

Duration of anaesthesia	Number of operation	Percentage (%)
Type of anaesthesia used for index operation		
GA	29	30.21
SAB	65	67.71
LA	2	2.08
Total	96	100.00
Duration of anaesthesia for index operation		
<1 hr	5	5.21
1-2 hr	75	78.13
2-3 hr	16	16.67
Total	96	100.00

Table-4: Classification and major Complications of patients (N=96)

Grade	Number of cases	Percentage (%)
Classification of complications		
Grade I	18	18.75
Grade II	11	11.46
Grade IIIa	24	25.00
Grade IIIb	28	29.17
Grade IVa	6	6.25
Grade IVb	2	2.08
Grade V	7	7.29
Total	96	100.00
Major complications		
None	75	78.13
MI	1	1.04
Sepsis	2	2.08
CCF	1	1.04
Hypotension	1	1.04
Aspiration pneumonia	1	1.04
Respiratory failure	3	3.13
Renal failure	2	2.08
Fecal fistula	10	10.42
Total	96	100.00

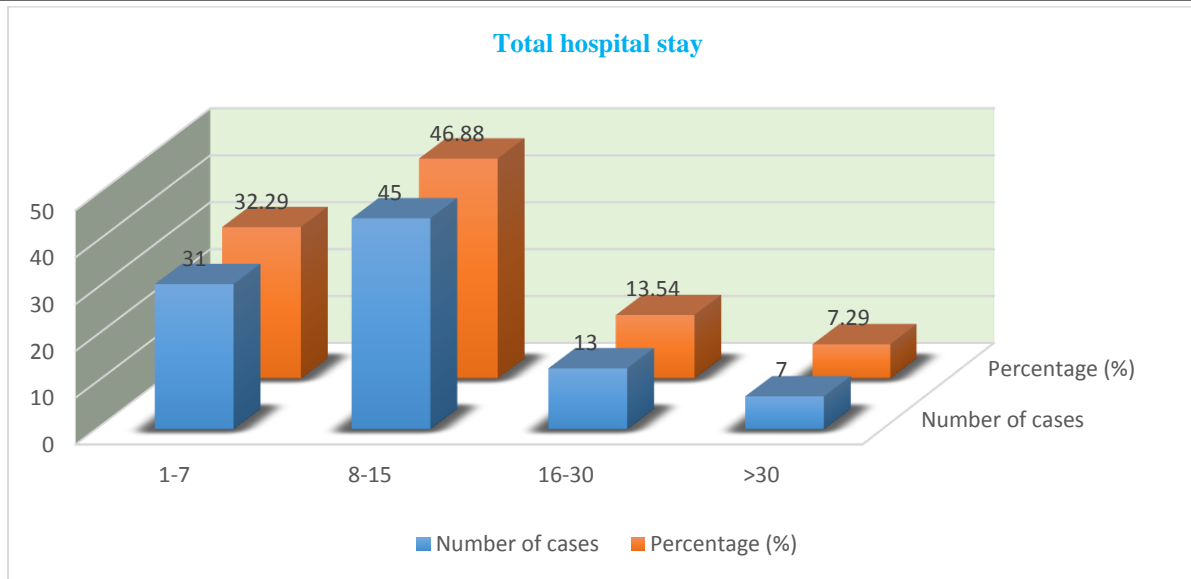


Fig-1: Total hospital stay in RMCH (N=96)

DISCUSSION

Among the admitted patients in surgery department about 2.66% are with postoperative complications following abdominal surgery. Female are predominant than male and most of the cases are of younger age (about 53.1%). A total number of 96 (Ninety six) out of 3613 patients with a mean age of 39.44 years (Std. Deviation of 15.180) and a range of 14-72 years admitted with postoperative complications following different types of abdominal surgery. The mean age 39.44 indicates most of the patients are young which differ from many study as because the older age group is a comorbid factors for developing postoperative complications. On the other hand, Aneral JJ, Bengoechea M. shown in a study that Increasing age does not affect mortality, morbidity or length of hospital stay¹⁸. In this study revealed that most of the patients were primarily operated by non-specialized. 26 patients

were primarily operated by specialist surgeon, 66 patients by MBBS that is non-specialist or non-experienced surgeon and 4 patients were operated by non-doctor. These second and third category surgeons avoid to perform operation of aged patients and patients having co-morbidity. Patient series shows that most of the complications developed within first week after operation (about 81.2%). In a study in USA Thompson JS et al shown that major complications are developed within first week about 77.7% which near to the present study.^[13] In this study shown that 60% patients developed postoperative complication following emergency abdominal surgery on the other hand 40% developed following elective surgery. Badar Murtaza et al shown in a study that the postoperative complications are more common in emergency laparotomies as compared to the elective ones¹⁹. In this study patients with postoperative complications



following Appendectomy (27.1%) rate is high and second most common following LUCS (12.5%) then cholecystectomy (11.5%). These three operations are invariably done both in the private clinic and government hospital of upazila and district level and also invariably done by non-specialized surgeon in our country without proper preoperative evaluation. Duration of anaesthesia in most of the operation were 1–2 hours. But patients who were more than 2 hours under anaesthesia developed most of the major complications. Duncan PG, Cohen MM. have been shown in a study that The type of surgical procedure, classified by site or by degree of trauma, did not influence post-anaesthetic complication rates. But the duration of anaesthetic exposure is an important determinant of risk and rate of complications increase with the length of anaesthetic time.^[17] In previous many study found that patients with preexisting illness were more likely to suffer anaesthetic complications. These tended to be organ-specific, but having any preexisting problem tended to place a patient at higher risk. However, such a conclusion must be tempered with the recognition that a given preoperative problem may dictate a closer perioperative observation (and hence complication detection) that does not occur without preoperative identification of a problem. Alternatively, the presence of preoperative risk factors may dissuade the surgeon and anaesthetist from usual practice, limiting operative services to more critical or more major procedures with prolonged anaesthetic time as a

result. Thus a cause-and-effect relationship between preoperative illness and anaesthetic complications remains to be definitively demonstrated.^[20] Patients admitted into Rajshahi Medical college Hospital with early postoperative complications following abdominal surgery are mainly referred from private clinics (83.3%) whereas from government hospital only 16.7%. In a study in Vienna by Julio CU. et al has been shown that appendectomy done in public hospital developed complications about 36% on the other hand in private hospital developed complications about 22%.^[21] That is in public hospital rate of complication is more than that of private clinic which differ from current study because in our country surgeons do not want to take risk about the morbidity of postoperative complications in private clinics. So when a complication developed as soon as possible they want to DE shoulder their patient and referred to a government hospital. On the other hand most of the clinics in Bangladesh are not sufficient enough to manage a case of postoperative complications. They have no ICU facilities, Blood transfusion facilities, trained nurse or other staffs and instruments to manage a case of postoperative complication. The duration of the operation is influenced by many factors such as; surgical technique (open or laparoscopic), intraoperative complications, prior abdominal surgery, surgeon's experience and the operating team.^[22] Many studies showed that prolonged operating time correlated with higher



intra and postoperative complications. Total abdominal hysterectomy, vaginal hysterectomy, Resection and anastomosis of gut, Prostatectomy, Multiple operation in a single settings need more time in an inexperienced hand. So complication developed after these operations are more likely. Postoperative care is as essential as the preoperative preparation for a successful outcome. Deficient care in either may produce unsatisfactory results irrespective of the standard of surgery.^[19] Postoperative care includes postoperative feeding, activity, pain control, appropriate medications and deep venous thrombosis prophylaxis. Wound Drain tube and Catheter care, Pressure sore prophylaxis are also important. In this study shown that in most of the clinic postoperative are cared by a person other than Nurse and doctor (44.8%). Most of them are illiterate or not medical personnel and do not know how to take care and manage a postoperative patient. So develop complications. Some studies show that pain control, patient satisfaction and bowel function are improved after abdominal surgery under epidural analgesia.^[23] Carli et al. showed in a prospective randomized study that epidural anaesthesia significantly shortened the duration of postoperative ileus and improved postoperative pain control. Postoperative complication rates and length of hospital stay was not shown to be improved in this study.^[24] In this current study none of the patient were anaesthetized by epidural anaesthesia. In general postoperative bleeding followed by haemoperitoneum and

pyoperitoneum after abdominal surgery is a rare complication. The risk depends on the performed surgical procedure, the co-morbidities of the patient and in individual cases on an impaired clotting system. In this study pyoperitoneum developed in 9.4% and haemoperitoneum 5.2% cases were not properly evaluated preoperatively. Missed diagnosis is a problem for postoperative surgical complication. In this study 7.3% patients were admitted with postoperative complication who were undergone abdominal surgery as missed diagnosed case. Newman-Toker, an associate professor of neurology and otolaryngology at the Johns Hopkins School of Medicine studied repeatedly and found that diagnostic errors, which are more common in primary-care settings, typically result from flawed ways of thinking, sometimes coupled with negligence, and not because a disease is rare or exotic.^[25] In classification of postoperative complication shown that Grade-IIIa and Grade IIIb (25.0% and 29.2% respectively) complications are more than Grade-I and Grade-II (18.8% and 11.5% respectively) and mortality rate was 7.3%. In Switzerland Daniel Dindo, MD et al studied with 6336 patients where Grade I complications were recorded in 45%, grade II in 25%, grade IIIa in 4.8%, grade IIIb in 24%, grade IVa complications in 9.7%, and grade IVb in 4.2% of patients. The mortality rate (grade V complications) was 7.3 %. This study differ from current study in case of Grade-I and Grade-II complication as because these type of complication are minor variety and can possible to manage in primary



and secondary health care center. Whereas the mortality of both study was same. Preoperative risk assessment for postoperative complications is essential when counseling patients about the risks of surgery because of their significant associated morbidity and mortality. There are many patient-related, operation-related, and anesthesia-related risk factors for the development of postoperative complications. Though many of these risk factors are not modifiable^[26] but proper preoperative evaluation can reduce the risk of postoperative complication. In this study 80.2% cases were not preoperatively evaluated in expected level are developed complications. Major complication developed in 21.9% cases among them 10.4% cases developed fecal fistula and 3.1% cases developed respiratory failure. Both of these and other major complications are grievous for the patient. About 46.9% patients had a total hospital stay of about two weeks and 13.5% patients had more than two weeks. This increased length of stay in hospital increase total hospital cost. Nadia A. Khan et al shown that Postoperative complications are associated with substantial increases in total hospital cost and LOS, even after adjusting for type of surgery, urgency of surgery, and preoperative patient comorbid conditions.^[27] Dimick et al reported increases in hospital costs and LOS with several postoperative complications in a study of 1,008 surgical patients.^[28] The existing scoring systems for postoperative morbidity and mortality are the American Society of Anaesthesiologists (ASA), the

APACHE scoring system (Acute Physiology and chronic Health Evaluation), POSSUM (Physiological and operative severity score for enumeration of mortality and morbidity), AFC (4-item predictive score of mortality after colorectal surgery) and the Cleveland Clinic Foundation colorectal cancer model. POSSUM calculates expected death and expected morbidity based on 12 physiologic variables and six operative variables. Disadvantages include not taking into account differences among the surgeons, anaesthetists, and operating time;^[21] all of which may influence postoperative complications and outcome of the patient. In this current study these variables like quality of surgeon, quality of anaesthetist (whether anaesthetist surgeon himself or an individual trained anaesthetist) are highlighted. In our perspective many of operation are done by non-specialist surgeon, even some are done by non-doctor like nurse, medical assistant, village doctors, health assistant, quack etc. These types of personnel are not recommended for doing surgery but they invariably doing so, even some kind of major surgery. As they do not know details about the postoperative complications and their management, they referred patients to tertiary level hospital like Rajshahi medical college hospital.

Limitations of the study:

The present study had few limitations such as this study was conducted in a single hospital and had a small sample size that may not reflect the whole scenario.

CONCLUSION

Patients with postoperative complications consume considerably more health care resources. Initiatives that target prevention of these events, even if costly to implement would significantly improve quality of care and patient safety. Further large study should be needed to discover the actual surgical care status, surgical cost,

postoperative complications, maltreatment and inadequate facilities for treatment in primary and secondary healthcare centers of our country. Availability of facilities like modern diagnostic capabilities, well equipped operation theatre, specialist surgeon, ICU, Specialist anaesthetist and proper nursing care should be ensured in primary and secondary health care center to prevent post-operative complications.

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