Study on Surgical Re-Admission in DMCH

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Summary:

Introduction: Re-admission of surgical patients following discharge from a surgical care unit to the same or different hospital is not uncommon. Underlying causes varied. Majority of re-admission are unplanned. Postoperative complications are mainly responsible for patients to seek re-admission. Post operative complications are the mainly liable for surgical re-admission.

Methods: A prospective study was performed in General Surgical units of Dhaka Medical College Hospital, Dhaka for one year from August'2011 to July'2012. Amongst the patients admitted in surgical units, all re-admitted patients within the period had been studied. Purposive sampling was done. Rate, cause, avoidability etc. were studied according to criteria.

Results: Among 4396 admitted patients 294 (7%) had history of previous admission in surgical department of different hospitals. 65% patients were male and 70.07% were middle aged (20-50yr). 67% re-admisssion occurred through emergency department of which 67.7% were unplanned. 58% re-admission were avoidable. Diagnosis at re-admission contains quite a long list but notables were loop ileostomy (23.47%), enterocutaneous fistula (10.54%), incisional hernia (9.52%), mature colostomy (8.84%), wound infection (8.5%) and subacute intestinal obstruction (4.76%).

Conclusion: Re-admission can be a contributing factor to assess quality and performance. It should be focused in audit and practice.

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Introduction:

Numerous indicators may be used to evaluate the quality of hospital services, including readmission rate. The readmission rate may reflect the impact of hospital care on the patient's condition upto the point of discharge, as well as describing the efficiency of the service. The readmission rate is easily calculated by hospital information system and may be readily combined with other data[1].

Hospital readmission can be defined as patient admission to a hospital within a certain period after discharge [2]. The time span varied in literature from thirty days to several years[3]. Some of the used definitions of re-admission are, "the next subsequent admission of a patient as an immediate (that is, emergency or unplanned) admission to any hospital within the same district, within a defined interval of a previous (index) discharge taking place within a defined reference period"[4]. Other views are hospital readmission as an inpatient admission of a patient to a hospital within 90 days of an inpatient discharge from the same hospital[5]. In one literature they defined, hospital readmission can be defined as patient admission to a hospital within a certain period after discharge from the same hospital. The time span varied in the literature from thirty days to several years[1]. Another definition is, a second admission, to any hospital in Washington State, within 7 or 30 days of discharge. Crude 7-day and 30-day readmission rates were compared in rural and urban hospitals[6].

Readmission rates following surgery are an indirect measure of quality of surgical management. The diagnoses commonly observed during readmission (postoperative infection, digestive disorders, and complications of treatment), however, suggest that readmission generally reflects complications of surgery. Some patients develop complications immediately following surgery and remain hospitalized longer, rather than being discharged and readmitted. This may reflect important quality problems that cannot be identified using readmission as a marker. The use of logistic regression analysis, however, controlled for this potentially confounding variable[6].

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The literature demonstrates that surgical readmissions are more avoidable than medical readmissions [4,7,8]. Furthermore, elective surgery is technically performed under planned, controlled conditions, with more thorough preparation by anaesthetic and surgical specialists. The ward is prepared and stuffed for the patient, who is anticipated to have a predictable and stable recovery [6].

Hospital record linkage is essential for diagnosing re-admission accurately. Now a day, it is very easy to develop a database linkage for a hospital and developing it regularly for future practice. Bangladesh is trying to coup up with those trends of modern technologies and digitalization is on process.

Method:

The observational, prospective, cross-section study was done from August2012 to July 2013 in general surgical wards of DMCH to study the frequency and pattern of surgical re-admission. All patients re-admitted into surgical wards were studied. Data was collected through direct interview and hospital documents. Results were calculated in broad sheets.

Readmission is defined as next subsequent admission of a patient as an immediate admission with an interval. Index admission is defined as previous hospital admission which may be routine or emergency for surgical purpose. Re-admission can be planned, unplanned, avoidable or unavoidable according to initial procedure as well as cause of subsequent admission needed.

Confidentiality and consent were maintained throughout the study. Ethical Clearance Certificate was issued by Chairman, Ethical Review Committee, Dhaka Medical College, Dhaka for the study on 25.02.2012.

Results:

Within the period, total 4396 patients was admitted to Surgical wards of DMCH from which 294(7%) patient were selected for the study. 68% re-admitted patients were male and rest were (32%) female. among the re-admitted patients 84 (28.57%) were 20-30year age group, 66(22.45%) were 30-40year age group, 56(19.05%) were 40-50 year age group. 65% of them came from outside the Dhaka and 35% were from within Dhaka.

67% patients were admitted through emergency room and 33% through elective admission where 67.7% re-admission were unplanned and 32.3% were planned (Table I).

Table-I

Types of re-admission

	Planned	Unplanned	Total
Emergency	57	139	196 (67%)
Elective	38	60	98 (33%)
Total	95 (32.3%)	199 (67.7%)	294 (100%)

Table-II

Diagnosis at Re-admission

Diagnosis	No. of Patient
Mature loop ileostomy	69(23.47%)
Intestinal leakage (Enterocutaneous fistula)	31(10.54%)
Incisional hernia	28(9.52%)
Mature colostomy	26(8.84%)
Wound infection	25(8.5%)
Subacute intestinal obstruction	14(4.76%)
P/O acute abdomen	12(4.08%)
Post cholecystectomy complication (pain +/- jaundice)	11(3.74%)
Abdominal wound dehiscence	8(2.72%)
Recurrent Ca-Breast	3(1.02%)
Prolapsed ileostomy stoma	3(1.02%)
Port site infection	3(1.02%)
Discharging sinus (on previous scar)	3(1.02%)
Recurrent inguinal hernia	3(1.02%)
Reccurent fistula in ano	3(1.02%)
Billiary peritonitis	3(1.02%)
Miscellaneous *	46(15.65%)
Total	294(100%)

*Post appendectomy septicemia with shock, Billiary fistula with wound infection, Post LUCS acute abdomen, Post operative shock, Amputation stump infection, Recurrent Ca-Colon, Bleeding from stoma site, Recurrence of malignant GIST (2 patient each)
P/o scrotal hematoma, Prolapsed colostomy stoma, 9th POD of hernioplasty (Rt sided) with Hemophilia B, Severe anemia with infected amputated stump, Post Gastrojejunostomy electrolyte imbalance, CBD injury, Hepaticolithiasis with Choledocholithiasis, Umbillical port hernia, Reccurent malignant mesenchymal tumor, Post circumcision bleeding, Recurrent abdominal lump (MFH), P/O lymphoedema of lower limb, Retrograde jejunogastric intussusception, Per rectal bleeding, Hypocalcaemic tetany, Bleeding from feeding enterostomy site, Hematuria with Renal failure, Biliary fistula, Hematuria, Recurrent Ca-Stomach, Stromal ulcer, ARF, Malignant GIST in biopsy of appendix, Post tubectomy acute abdomen and shock, Incisional hernia with ITP, Excoriation around stoma, Transection of CBD, Stomal complication with fistula, Urinary fistula, Post splenectomy pyrexia (1 patient each)

Table-III

Diagnosis in index admission

Diagnosis at index admission	No. of patient
Gastrointestinal	
Acute Intestinal Obstruction	25
Ileal perforation	43
Ca Stomach	5
Ileocaecal TB with obstruction	4
Intestinal lymphoma	3
Colorectal	
Acute appendicitis	35
Sigmoid volvulus	11
Ca Rectum	8
Ca-Rectum with obstruction	5
Ca-Colon	3
Trauma	
Penetrating Abdominal trauma	15
RTA with polytruma	22
Hepatobiliary	
Choledocholithiasis	4
Breast & Endocrine	
Ca Breast	5
Gynaecological	
Fibroid uterus	6
Obstructed labour	5
Term pregnancy with PROM	3
Bulky uterus	3
Miscellaneous*	42

*Malignant intestinal GIST, ITP (for splenectomy), Fistula in ano, PVD (Buerger's disease?), Term pregnancy with oligohydramnion, Post term pregnancy (2 patient each)
Ca Oesophagus, Jejunal adenocarcinoma, Abdominal lump *(no description was found),* Appendicular abcess, Perianal abcess, Rectal prolapse, Strangulated thrombosed piles, Assault (cut injury over left thigh), Penetrating perineal injury, Accidental rectal injury, Gunshot injury, Barotrauma to rectum, Cholelithiasis, Goiter, Renal cell carcinoma, BEP, Ca-Prostate, Hydrocele (Rt), Varicocele (Rt), Ritual (for circumcision) with Hemophilia A, Rt inguinal hernia with Hemophilia B, Left sided reducible indirect inguinal hernia, Incisional hernia, Umbillical hernia, Malignant mesenchymal sheath tumour, Ruptured ectopic pregnancy, Ovarian cyst, Post DNC complication, Inguinal swelling, Family planning (1 patient each)

Table-IV

Operation done (during index admission)

Operation done	No of Patient
Repair of ileal perforation with ileostomy	42
Appendectomy	32
Sigmoid colostomy	26
Cholecystectomy (open)	21
Loop ileostomy	16
Resection and anastomosis of ileum	13
Resection of gangrenous portion with ileostomy	12
LUCS	12
Repair of duodenal perforation	11
TAH	9
Repair of ileal perforation	8
Resection & anastomosis of ileum with ileostomy	7
Cholecystectomy (lapchole)	7
Exploratory laparotomy	7
Hernioplasty	6
Resection of gangrenous portion with colostomy	6
Modified radical mastectomy (with axillary clearance)	4
Partial gastrectomy with gastrojejunostomy	4
Choledocholithotomy	4
Rt Hemicolectomy	3
Miscellaneous*	46

*Left midthigh amputation, Repair of duodenal perforation with gastrojejunostomy, Appendectomy with loop ileostomy, Feeding enterostomy, Excision of tumour, Excision of tumour, I & D, Herniorraphy (2 patient each)
Excision & eversion of sac, Primary repair of wound, Lumpectomy (of breast), Excision of varicocele, Anterior resection with ileostomy, Resection & anastomosis of sigmoid volvulus, Fistulectomy, Circumcission, Laparotomy & resection of lump *(no description found),* Excision of inguinal swelling (left), Hartman's procedure, Resection & anastomosis, Mucosal resection of rectal prolapse, Thyroidectomy, Ovarian cystectomy, Left sided nephrectomy, TURP, Amputation of 3rd toe (left), Appendectomy & excision of mesenteric mass, Excision of tumour & duodenojejunostomy, Prostatectomy, APER, BLTL, Splenectomy, Wound toileting & suturing, Resection, anastomosis of ileum & colostomy (?), Fistulectomy (1 patient each)

Table-V

Diagnosis in index admission and why re-admission needed

Diagnosis	No. of patient	Re-admitted due to (majority cases)				
		Stoma closure	Intestinal leakage	Wound infection	Abdominal pain/ acute abdomen/ peritonitis	Incisional hernia
Acute intestinal obstruction	25	4	2	7	9	3
Ileal perforation	43	23	7	4	2	2
Acute appendicitis	35	-	5	17	6	
Sigmoid volvulus	11	7	-	3		1
Penetrating abdominal trauma	15	8	-	4	-	2
RTA with polytrauma	17	6	-	7	-	3
Choledocholithiasis	4	-	-	1	3	-

37.07% patients were re-admitted within 1-7days interval, 32.31% patient within 91-180days, 14.28% patient re-admitted after one year. The chart also shows that 49% re-admission occurred within 90 days after discharge. (Fig 1)

58% re-admission were avoidable, 34% were unavoidable (Fig 2)

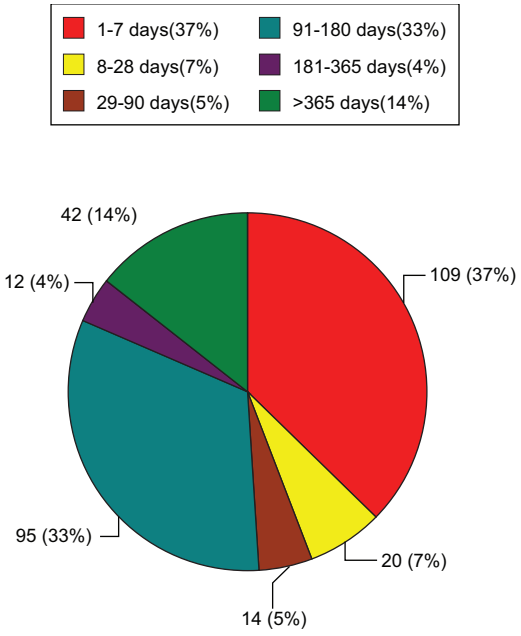

Fig. 1: *Interval between two admission*

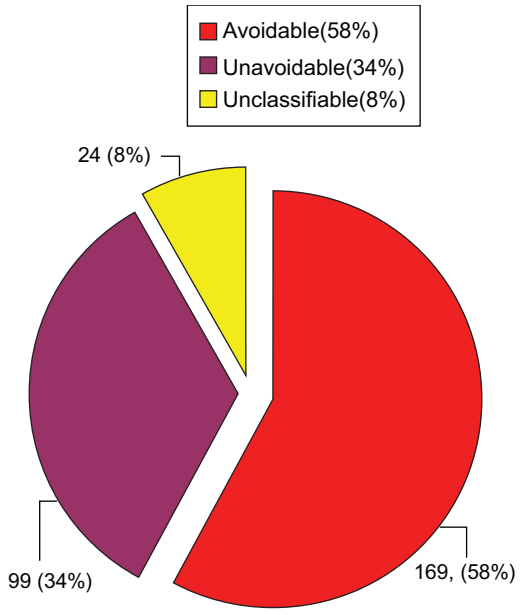

Fig.-2: *Type of Re-admission*

Discussion:

Decreasing the incidence of readmission has increasingly become a goal of care givers, hospital administrators, and policy makers[9].

In this study we found surgical re-admission rate is 7% (Fig 3.1)which is quite higher than study findings by Hull (4%), North East Thames[7] (4.1%),

Leicestershire[10] (4.5%), and Oxford[11] (5.3%). On the other hand, higher readmission rates were recorded for some states of US, such as New Jersey (21.9%), Louisiana (21.9%), and Illinois (21.7%), and for other states, such as Oregon (15.7%), Utah (14.2%), and Idaho (13.3%) [12]. Surgical re-admission rate in Aga Khan University Hospital, Pakistan was 6.4% on 2014[13] which was a bit lower than us. But the pitfall is different study targeted different population as some study showed re-admission in total hospital, some showed re-admission for some specific cases. That's why it is difficult to comment about our re-admission rate in context of other studies.

Different co-existing disease plays the vital role and social factor more or less influences the picture. Countries where home delivery of care is lower – elderly people commonly brought to hospital. In our study, Dhaka Medical College is the best service provider institute in the whole country. So, some one-third people came here from different districts also.

About 67% of the re-admitted patients were admitted through emergency department (Table-1) and 67.7% of the re-admissions were unplanned (Table-1) also. Planned re-admissions in surgical units were mostly for second stage surgery (i.e. stoma closure etc.) or mitigating complications as per advice. Emergency re-admissions were commonly for complications (i.e. wound complications, fistula development, acute abdominal conditions etc) or unrelated emergencies. Unplanned emergency re-admission was 47.27% which indicates mainly surgical complications and can be avoidable to some extent.

Most of the re-admission in DMCH were initially admitted and treated in same institute (i.e. 49.66%). It signifies that half of our patients had index admission in DMCH and admitted here again for planned or unplanned (complicated) indications. This bulk of patient is potentially reducible through regular audit and skilled surgical care.

Surgical re-admission in our study shows a bimodal distribution of patient in Fig-1. 37% of all patients re-admitted within one week of discharge and other 33% of them admitted again after three to six months of discharge from the hospital. If we compare the data with table-1 and look again the study sheets – we can find that the first group signifies surgical complications and second group surgical plan for re-operation or second stage surgery.

"Are re-admissions avoidable?" was asked by Clarke on 1990. The answer was ambiguous and to some extent it is always true. Especially, surgical enthusiasm and calculating risk-benefit in every step plays an important role in answering avoidability of re-admission in surgery. Avoidibility was between 18% to 77% in different studies performed previously[10]. We found in our study that 58% of all re-admission were avoidable (Fig 2) – if tried.

Hospital stay in index admission affects re-admission rate. Commonly patient discharged earlier without fulfilling discharge criteria shows more incident of re-admission. But in our study we could not find any specific pattern to relate the finding with any other study. A significant portion (i.e. 13.6%) had hospital stay more than two weeks but admitted again. Most of them were trauma patients needed multiple procedures with stoma.

It is notable that total planned re-admission (32.3% in Table 1) were admitted with only two diagnosis i.e. mature ileostomy and colostomy. Other all diagnosis was emergency re-admission. The list of unplanned re-admission almost fully deals with operative complications and pitfalls. If proper caution and skill could be applied – many re-admissions can be avoided or at least managed with post operative OPD follow up clinics. We could not judge the conditions about recurrent tumors (i.e. breast, colon, rectum, GIST etc.) as documents contains little about clearance, margin, histopathology, chemo/radiotherapy and follow up.

Complications are more or less part of surgery. No surgery is without some chance of complication. But we urgue that those complications can be avoided if surgeon makes effort and continuous audit and development is needed. Some of those patients may not need any further operation. Sometimes social factors act as avoidable factor i.e. compliance[4]. In our study we described that 58% re-admission reveals avoidable. Although the proportion of preventable readmissions is variable in the literature, it is agreed that the readmission rate includes a significant fraction of events of ill-health that could have possibly been avoided[14-15]. Our study shows correspondence with the observation of Clarke[4] as readmissions within week after discharge are significantly more avoidable.

In 1965, Acheson and Barr suggested that the readmission rate might serve "as an index of the quality of medical care"[16]. This idea has lately regained ground and readmission rates have been described as "one of the few potential measures available from routine statistics for assessing outcome"[11]. The association between readmission rate and quality of care has been validated in methodologically-sound meta-analyses, cohort and case-control studies[17]. Ideally, outcome indicators should be chosen that measure genuine service objectives[4]. That's why re-admission rate should act as a contributing indicator for quality of care of an institution[18]. Many readmissions represent a failure of the best care[19]. Unplanned readmission might usefully form the focus of practicing audit[20].

Conclusion:

The way of surgical improvement is to mitigate the volume of complication and hence re-admission and re-operation also. Our situation is not worse than any standard practice. Still, it demands more caution, more study and more improvement. Best practice of audit can improve our universal performance and patient care.

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