Indications of laparotomy in the rural hospital in the low and middle income countries: our 3 years experience in the Ruhengeri referral hospital

Abstract

Background: Laparotomy is a major, high risk intervention commonly done with therapeutic and for diagnostic purpose. Most of patients with abdominal surgical conditions do not get timely access to that intervention because of paucity of skilled physicians at district hospital for diagnosis and subsequently to intervention in the LMICs, which lead to high mortality and morbidity rate at high level hospitals. The aim of our study was retrospectively to identify the commonest surgical conditions which need laparotomy and their management in the rural areas at district hospital in the LMICs.

Methods: This is a 3 years retrospective study done in the Ruhengeri referral hospital on the patients who underwent laparotomy in the department of surgery from September 2016 to August 2019. The age, sex, diagnosis and initial management have been analyzed.

Results and discussion: In this study 232 patients underwent laparotomy for various reasons. The highest incidence was between 21 and 30 years and above 65 years, most of them were men. Globally, the common diagnosis was small bowel obstruction and sigmoid volvulus followed by hollow viscus perforation.

Conclusion: This study depicts the burden of surgical abdominal conditions in the remote areas laparotomy can be done at district hospital level if infrastructures and qualified human resources are available.

Keywords: surgical abdomen, laparotomy, bowel obstruction, hollow viscus perforation, rural hospitals

Background

Laparotomy is usually performed on the patients with acute or unexplained abdominal pain, in the patient with abdominal mass and in some patients with abdominal trauma. It is done routinely mainly for curative and for diagnostic purpose in the patients with intrabdominal malignancies. It is a common operation that is most frequently carried out with life-saving intent, but which nevertheless carries substantial mortality. The early complications are paralytic ileus, Intra-abdominal collection or abscess, wound infections, abdominal wall dehiscence, pulmonary atelectasis, enterocutaneous fistulas, while late complications are adhesions, incisional hernia. Delay in the decision making for emergency laparotomy is hazardous, more it is diagnosed early more outcome is likely to be good. The abdominal surgical conditions geographically differ from one region to another. Delay in surgical interventions and outcome differ due to the different facilities, due to infrastructures, surgeon skills and patient conditions. This makes it an important topic in its own right and a potential proxy for role in decision making that was influenced by adverse attitudes and beliefs about available care.

The most frequently identified financial barriers were the cost of care and the indirect costs related to lost opportunity for work, finding a caretaker for their children, and the cost of bringing a caretaker with them. In the rural hospitals researches are not frequently done due to the great work, paucity of skilled human resources, infrastructures (documentation, internet), motivation. We carried out this study to look for the common surgical abdominal conditions found in the rural hospitals and the common procedures done. This information will be shared internationally to help policymakers be aware of some emergency needs in the rural hospitals, developing capabilities in resource-poor settings, to potentially decrease overall cost, develop the infrastructure necessary to entice physicians and other healthcare workers to remain in these rural hospitals.

Methods

This is a retrospective study done over 3 years period from September 2016 to August 2019 in the Ruhengeri referral hospital. All patients underwent laparotomy in the department of surgery with sufficient data have been enrolled into the study. There was no age or sex, emergency or elective case restriction. Patients underwent cesarian section and other elective gynecological conditions have been excluded as they represent a separate operative group with different management needs. Analyzed variables were: age, sex, intraoperative findings and procedure done. Data have been analyzed using SPSS 16.0 and correlation statistical analysis for age and diagnosis was calculated, and positive correlation was significant if P value is <0.005.
Results

In this study 232 patients underwent laparotomy, sex ratio M: F was 2.2:1. The most affected ages were young people and old people, 21-25 years and above 65 years, 12.9% and 13.4% respectively. The most common final diagnosis was small bowel obstruction (22.2%) followed by sigmoid volvulus (15.3%). Small bowel obstruction was most common in young people while sigmoid volvulus was common in the older people. The bowel obstruction and perforation are common in males while appendicitis, small bowel obstructions are common in females. Female’s patients are more likely to undergo many different types of surgical procedures. Table 1 & 2 The most common procedure done was bowel resection and primary end to end anastomosis (101 cases, 40.6%) Figure 1 & 2.

Table 1 Intraoperative findings

| Final Diagnosis       | Frequency | Percent | Valid Percent | Cumulative Percent |
|-----------------------|-----------|---------|---------------|--------------------|
| Missing               | 16        | 6.5     | 6.5           | 6.5                |
| Sigmoid volvulus      | 38        | 15.3    | 15.3          | 21.8               |
| Redundent sigmoid     | 6         | 2.4     | 2.4           | 24.2               |
| Micellanous           | 34        | 13.7    | 13.7          | 37.9               |
| Ileal perforation     | 28        | 11.3    | 11.3          | 49.2               |
| Appendicitis          | 22        | 8.9     | 8.9           | 58.1               |
| Small bowel obstruction| 55      | 22.2    | 22.2          | 80.2               |
| Intussusception       | 8         | 3.2     | 3.2           | 83.5               |
| Duodenal perforation  | 11        | 4.4     | 4.4           | 87.9               |
| Gynecological problems| 6         | 2.4     | 2.4           | 90.3               |
| Gastric tumor         | 11        | 4.4     | 4.4           | 94.8               |
| Gastric perforation   | 13        | 5.2     | 5.2           | 100                |
| Total                 | 248       | 100     | 100           |                    |

This table is showing frequency of the common intraoperative findings during explorative laparotomy, miscellaneous findings where the less common diagnosis which were hepatobiliary conditions, urology conditions, hypersplenism, intrabdominal organ injuries due to trauma.

Table 2 Procedures done

| Procedure                        | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------------------------|-----------|---------|---------------|--------------------|
| Missing                          | 16        | 6.5     | 6.5           | 6.5                |
| Sigmoidectomy + primary ETEA     | 44        | 17.7    | 17.7          | 24.2               |
| Sigmoidectomy + colostomy        | 6         | 2.4     | 2.4           | 26.6               |
| Appendectomy                     | 24        | 9.7     | 9.7           | 36.3               |
| Perforation repair + wash out    | 32        | 12.9    | 12.9          | 49.2               |
| Hemicolectomy + anastomosis      | 11        | 4.4     | 4.4           | 53.6               |
| Ileal resection + Primary ETEA   | 46        | 18.5    | 18.5          | 72.2               |
| Ileal resection + ileostomy      | 11        | 4.4     | 4.4           | 76.6               |
| Miscellaneous                    | 58        | 23.4    | 23.4          | 100                |
| Total                            | 248       | 100     | 100           |                    |

This table is showing frequency of surgical procedures done in the rural hospitals. Miscellaneous surgical procedure done is the ones which are less common: hepatobiliary surgery, urologic surgery, gastrectomy or pyloroplasty, splenectomy and gynecological procedures.

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Discussion

Laparotomy is a common major operation with high risk done in almost all high level facilities to save lives. Frequently the exact diagnosis is found when the abdomen is open. Even if paraclinical investigations means are being developed are expensive and poorly distributed around the world. The surgeon remains the one to make decision to decide the laparotomy guided by clinical findings. In our study the males where more affected than female with M:F ratio of 2.1:1. This is the same wordwide. In our study, male sex is at high risk of small bowel obstruction, sigmoid volvulus and hollow viscus perforation whilst in female’s appendicitis, is the first followed by small bowel obstruction and other miscellaneous surgical conditions like cholelithiasis, gynecological problems. In the study done by Obonna et al., in Nigeria, revealed that females are more affected by appendicitis intestinal obstruction and hollow viscus perforation than male, to small bowel obstruction which was the most common in males than females. The abdominal surgical conditions are bivariate, are more common in the young population in the 2nd (19.8%), 3rd (15.2%) decade and above 65 years. In Africa due to high fiber enriched food, the prevalence of redundant sigmoid is high and this put the population with advanced age to the high risk of sigmoid volvulus. In the young population the most common causes of laparotomy are hollow viscus perforation. In his study done in India by Anjaneya et al all has shown also that hollow viscus perforation a are common in the young population in the 3rd and 4th decade. Our study revealed that small bowel obstruction and appendicitis are most common in young population while above 65 years sigmoid volvulus leads followed by small bowel obstruction and gastric malignancies in our study. In their studies done in the different hospitals in Ethiopia Wossen et al., John Owode Agboola et al & Addisu Melkile et al shown that appendicitis leads the list followed by intestinal obstruction and hollow viscus perforation. Generally, intraoperative diagnosis in our study was Intestinal obstruction (Small bowel obstruction was the 1st 22.9% followed by sigmoid volvulus 15.3% and intussusception 3.2%). In the study done by Soressa et al., revealed the similar results: Small bowel obstruction, sigmoid volvulus and intussusception occupy 61.2% followed by large bowel obstruction where sigmoid volvulus is 69%. The second was hollow viscus perforation while appendicitis was the 3rd. This is in the contrast to the studies done by John Owode Agbobola et al all in Nigeria and Solomo Gebre et al and Addisu Melkile et al in Ethiopia where acute appendicitis was the commonest followed by pethonisis secondly to the hollow viscus perforation and appendicitis. Globally surgical abdominal conditions are common worldwide and young and old people are highly affected, especially in the rural areas with limited means to access appropriate surgery timely.

Conclusion

The most common indications of laparotomy in the rural areas in the low and middle income countries are emergencies and most people do not get access to the quick surgical intervention which leads to poor outcome compared to the high income countries. The world has to put more effort to enhance education in training many qualified surgeons and look for strategies to interest them to work in the rural areas where the great number of the population with limited resources do not get access surgery. This may be one but not only a solution to improve outcome of acute abdominal surgical conditions in the rural areas and globally worldwide.

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Conflicts of interest

The authors declared that there are no conflicts of interest.

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