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Non-Traumatic Abdominal Surgical Emergencies at the Kolondiéba Referral Health Center (MALI)

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Abstract | **Original Research Article**

Introduction: The aim of this study was to determine the epidemioclinical profile and evaluate the management of non-traumatic abdominal surgical emergencies. ***Methodology*:** This was a retrospective, descriptive, cross-sectional study from January 1, 2023 to December 31, 2024. All patients treated for a non-traumatic abdominal surgical emergency in the general surgery unit of the kolondiéba referral health center were included. ***Results*:** We managed 201 non-traumatic abdominal surgical emergencies, representing 29.6% of surgical procedures (n:677) and 84% of abdominal surgical emergencies (n:239). Mean age was 30.56 years, with extremes of 1 year and 81 years. The majority of patients were male (61.2%). Housewives and farmers were in the majority, with 33.8% and 26.3% respectively. Average duration was 113 hours. Abdominal pain was present in (98%), vomiting (93.5%), and cessation of matter and gas (39.8%). Ultrasound and radiography of the abdomen without preparation had been performed in (59.7%) and (27.8%) respectively. The etiologies most frequently encountered were acute appendicitis (28.3%) and acute generalized peritonitis (26.3%), with 16% of complications dominated by parietal suppurations (11%), and a mortality rate of 3%. The average length of hospital stay was 8.2 days. ***Conclusion*:** Non-traumatic surgical emergencies are frequent and associated with a high complication rate at the center. Improving the technical level in terms of personnel and equipment could help improve prognosis.

Keywords: Emergencies, Abdominal Surgery, Non-Traumatic, Kolondiéba.

INTRODUCTION

Abdominal surgical emergencies occupy an important place in the surgical activity of general surgery departments, especially in rural centers. The majority of these emergencies are of non-traumatic origin. For example, in Niger in 2016, a study recorded 91.47% non-traumatic etiologies out of 622 acute surgical abdomens [1].

At Dakar's Hospital le Dentec (2016), non-traumatic abdominal emergencies accounted for 20% of surgical activity in patients aged over 16, with a 4.96% case-fatality rate [2], and in Lomé in 2005, 54.25% of hospital admissions concerned these emergencies [3]. In Mali, in 2021, at the San referral health center, a study recorded 124 cases (96.12%) out of 129 abdominal surgical emergencies [4]. The most frequent presentation in these emergencies was non-traumatic abdominal pain. The incidence of such pain has been estimated in the literature at 5-10% of emergency department admissions [5], with an overall need for abdominal surgery of 15% [6], and an absolute need of 4.7% [7].

In rural health services, characterized by a shortage of qualified staff and sophisticated diagnostic facilities, many patients suffering from abdominal pain are referred to surgical units. It is up to the surgical teams to differentiate between surgical and medical etiologies, and to make an operative decision on the basis of a radiological work-up that can be summed up as little as possible (unprepared abdominal X-ray and ultrasound), often performed by non-expert hands. In this difficult context, the general surgeon becomes the hub for the management of these non-traumatic abdominal pains. To assess our management of non-traumatic abdominal surgery, we initiated this study.

METHODS AND MATERIALS

This was a retrospective, descriptive, cross-sectional study lasting two years (January 1, 2023-December 31, 2024).

Sampling: We used convenience sampling.

We included all records of patients admitted and managed for a non-traumatic abdominal surgical emergency in the general surgery unit of the kolondiéba referral health center.

Not included were records of patients evacuated to Sikasso regional hospital and Bamako university hospital centers, patients who died before care, abdominal trauma and acute surgical abdomens in neonates.

STUDY SETTING

The study took place at the kolondiéba referral health center, in the Sikasso region. The center has a 7-bed general surgery unit, adjoining a 12-bed medical unit used as needed, and an operating theatre with two operating theatres. The unit is staffed by a general surgeon and an anesthesia and intensive care assistant. The center receives surgical emergencies from all over the health district, with a surface area of 9200km2 and a population of 321451 in 2024. The health care system is organized around community health centers, of which there are 23, and private practices (medical, care). The surgical unit, the only one in the district, receives emergencies from these peripheral health structures. Emergencies requiring complex resuscitation are evacuated to the regional hospital (Sikasso), 225km away, or to hospitals in the capital (Bamako), 250km away.

Variables Studied

Age, gender, residence, mode of admission, clinical signs, imaging, diagnoses, complications, case fatality, length of hospital stay.

Data Collection

Data were collected from medical records, operative, anesthetic and hospitalization registers. Data were entered into Excel 2010 with an anonymization number, and analyzed using SPSS .27 software.

Tests Used: We used the Fischer test with a significance level of $P \leq 0.05$.

Ethical Considerations

The study did not predispose patients to any particular risk. They gave their consent to participate in this study.

Data were recorded with an anonymity number in the database, and the positive opinion of the Chief Medical Officer had been obtained.

RESULTS

Non-traumatic abdominal surgical emergencies accounted for 29.6% of surgical procedures (201/677) and 84% of abdominal surgical emergencies (201/236).

The overall mean age was 30.56 years, with extremes of 1 and 81 years.

For patients under 16, it was 8.64 and 71.42 for those over 60.

In Figure 1, we have represented the patients according to age group.

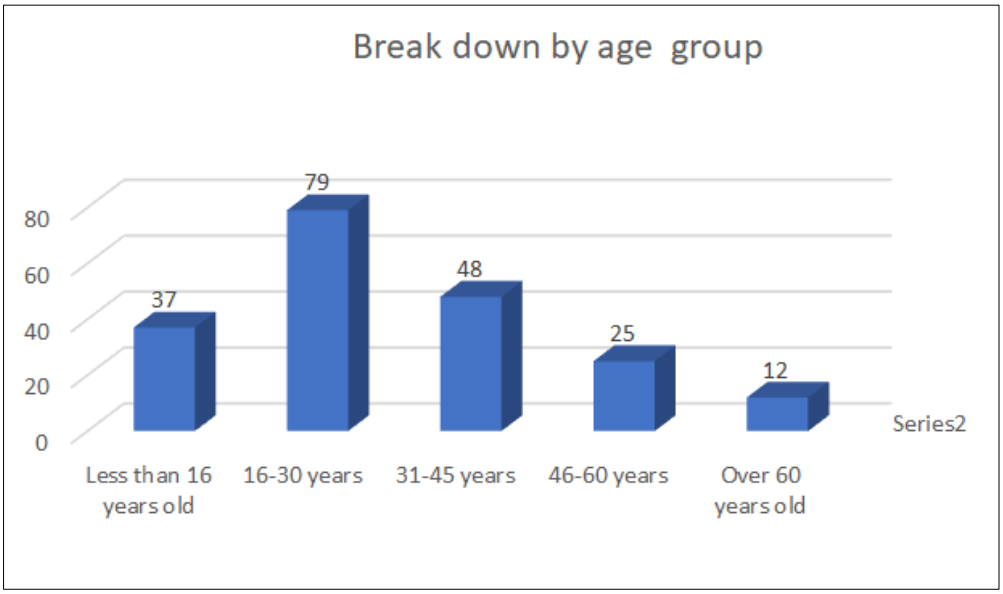

Figure 1: Age distribution

Gender

Males predominated 123 (61.1%) versus 78 females (38.8%), with a sex ratio of 1.57. This male predominance rose to 75.7% in the under-16s, but in the over-60s, we found an equality between the two sexes (50%/50%). Figure 2 shows the evolution of gender variation by age group.

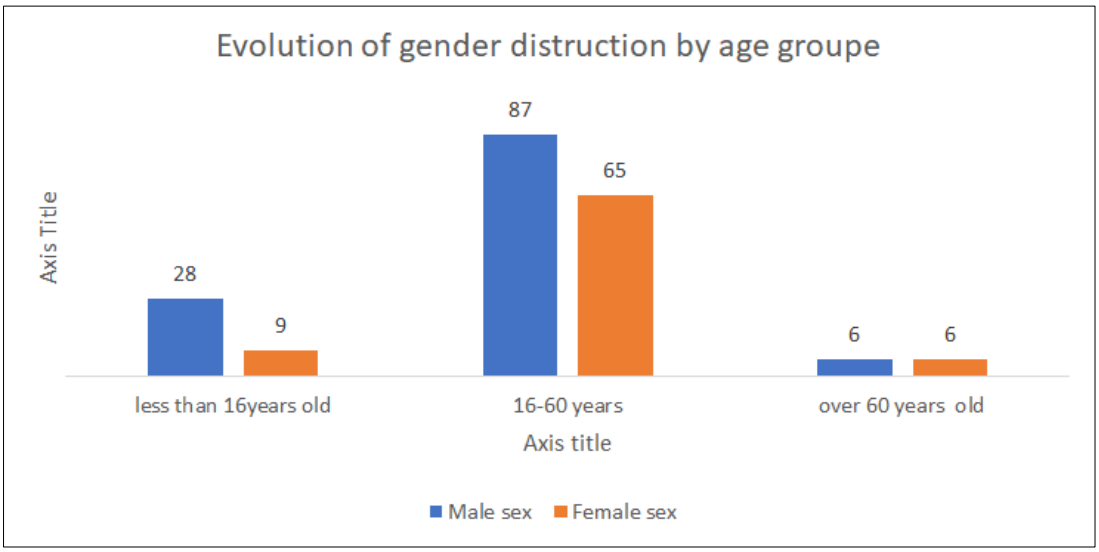

Figure 2: Evolution of gender distribution by age group

The mean evolution time was 112.57 hours, with extremes of 4 hours and 504 hours.

Mode of Admission: One hundred and eleven patients (55.2%) were admitted on an outpatient basis, compared with 92 cases (45.7%) of evacuations and 4 (1.9%) of maternity transfers. Patients residing outside the town of Kolondiéba numbered 170 (84.5%).

Table 1 summarizes the different professions practiced by the patients.

Table 1: Breakdown of patient professions

Professions	Workforce	%
Housewives	68	33.8
Cultivators	53	26.3
Students	27	13.4
Children	17	8.4
Bergers	14	6.9
Workers	6	2.9
Traditional goldpanners	5	2.4
Retailers	5	2.4
Other	6	2.9
Total	201	100

Other: civil servants:2 cases, salespeople:2 cases, seamstresses:1 case, household help:1 case.

Clinical Study

We found localized or diffuse abdominal pain in 197 patients (98%), vomiting in 188 cases (93.5%) and cessation of gas in 80 cases (39.8%).

Body temperature was above 37.8 in 65 cases (33.5%).

Physical signs were marked by localized abdominal defense in 93 cases (46.2%), generalized contracture in 53 cases (26.3%), diffuse dullness in 19 cases (9.4%) and the presence of a painful swelling in 18 cases (8.9%).

Biological findings included hemoglobin levels below 10g/dl in 30 cases (14.5%), and hyperglycemia in one patient.

Imaging examinations were carried out in 177 patients (88%), with 121 ultrasound scans (60%), 56 (27.8%) unprepared abdominal X-rays and in 24 cases (12%) no radiological examination at all. Clinical and paraclinical examinations revealed the etiologies listed in Table 2.

Table 2: Distribution of patients by etiology

Etiologies	Workforce	%
Acute appendicitis	67	28.3
Acute generalised peritonitis	53	26.3
Acute intestinal occlusions	25	12.9
Strangulated inguinal hernias	13	6.4
Appendicular abscesses	11	5.4
Acute intestinal intussusception	9	3.9
Ruptured ectopic pregnancies	7	3.4
Ovarian cyst torsion	7	3.4
Strangulated umbilical hernias	5	2.4
Strangulated white line hernias	2	0.9
Other	2	0.9
Total	201	100

Other: Unruptured liver abscess :1 case, hemorrhoidal thrombosis: 1 case

Etiologies of Acute Generalized Peritonitis

appendicular peritonitis 25cas (47.1%), typhoid ileal perforation 12cas (22.6%), gastric perforation 5cas (9.4%), post-caesarean peritonitis 5cas (9.4%), ruptured pyo-ovary 3cas (5.6%), biliary peritonitis 1cas, ruptured liver abscess 1cas, ileal perforation post umbilical hernia cure 1cas.

Etiologies of Acute Intestinal Occlusions

OIA by adhesions 10 cases (40%), bridles without necrosis 11 cases (44%), sigmoid colon volvulus without necrosis 1 case (4%), rectal tumor 1 case (4%), anal canal tumor 1 case (4%), ileal ligation post herniorrhaphy 1 case (4%).

Etiologies in children under 16 years of age included 12 cases (32.4%) of acute generalized peritonitis (5 appendicular, 6 ileal perforation, 1 ileal perforation post umbilical hernia cure), acute appendicitis 11 cases (29.7%), acute intestinal intussusception 7 cases (18.9%), adhesion occlusion without necrosis 3 cases (8.1%), strangulated umbilical hernia 3 cases (8.1%), unruptured liver abscess 1 case, appendicular abscess 1 case.

Etiologies in the Elderly Were Composed as Follows

acute appendicitis 3cas (25%), strangulated hernia 3cas (25%), appendicular abscess 2cas (16.6%), acute generalized peritonitis 2cas (16.6%), appendicular plastron 1cas (8.3%), anal canal tumor in occlusion 1cas (8.3%).

Surgical management of these conditions involved the surgical procedures summarized in Table 3.

Table 3: Breakdown of surgical procedures performed

Gestes	Workforce	%
Simple appendectomy	67	33.3
Appendectomy+wash+drainage	36	17.9
Hernia repair	19	9.4
Adhésiolyse simple	8	3.9
Resection of simple flanges	9	4.4
Ileo-ileal anastomosis	14	6.9
Revival of ileal suture margins / gastric/uterine)	17	8.4
Stomie	4	1.9
Ileo-colic anastomosis	5	2.4
Cystectomy	4	1.9
Right adnexectomy	7	3.4
Salpingectomy	4	1.9
Disinvaginations	3	1.4
Other	4	1.9
Total	201	100

Other: Cholecystectomy :1, lavage drainage of hepatic abscess :1, medical treatment of liver abscess :1cas, hemorrhoidectomy according to Milligan and Morgan 1cas.

We performed blood transfusion in 25 patients (12.43%)

Postoperative follow-up: postoperative follow-up was straightforward in 163 patients (81%) and complicated in 32 cases (15.9%), with 6 cases of death (3%). Table 4 lists the main complications encountered.

Table 4: Main complications encountered

Types of complications	Workforce	%
Superficial parietal suppuration	22	68.7
Post-operative OIA	05	15.6
Evisceration	3	9.3
Post-operative peritonitis	01	3.1
Digestive fistula	01	3.1
Total	32	100

In the under-16s, 7 complications were recorded (18.9%), with 5 cases of SSI, 1 case of evisceration and 1 case of post-operative peritonitis, while in the elderly, one case of covered evisceration was recorded (8.3%).

Deaths

We recorded 6 deaths (3%). Peritonitis was the most frequent cause of death, accounting for 4/6 cases (66.6%). Other pathologies were intestinal obstruction (1 case, 16.6%) and acute intestinal intussusception (1 case, 16.6%). Among children, one case of death was recorded (2.7%), and one case among the elderly (8.3%). Deaths were caused in 2 cases by suspected septic shock following appendicular peritonitis and acute intestinal intussusception, and in 4 cases by post-operative respiratory distress, including one case following OIA and 3 cases following acute generalized peritonitis.

The average hospital stay was 8.20 days.

DISCUSSION

Our overall frequency of non-traumatic abdominal surgical emergencies (84%) was lower than that of Camara M *et al*., [8], (95.9%) and Coulibaly M *et al*., [9], (96%), with a significant stastic difference (p :0.001). These disparities in frequency between health facilities could be linked to several factors, notably the level of health facilities and the local organization of surgical activities.

Among the elderly, our frequency of 6% was comparable to Sawane A's 8% [10] but lower than the 3.25% obtained by Lebeau R *et al*., [11]. This difference could be explained by the fact that we carried out our study in a rural environment with few care structures, compared with the Abidjan team, whose study took place in an urban environment with multiple hospital structures.

Patient Age

The average age of our patients was 30.56 years. In Ethiopia, in 2015, Mequanint Negash (MSC) *et al*., [12], found an average age of 26.5 years, close to our own.

Gender

Several African studies have shown the predominance of abdominal surgical emergencies in general among men [8-14].

In our study, the same finding was made with (61.1%) male patients, comparable to the 62% obtained by Sawane A [10], in 2022 in Bamako. This male predominance was more marked in children (75.7%), as Ademuyiwa *et al*., [15], had found in their study in Lagos with a rate of (80.6%), but unlike our study, the Nigerian team had included newborns. Nevertheless, a comparison of the different results led to the conclusion that non-traumatic abdominal emergencies were more common in boys than in girls.

Signs

Abdominal pain is the main reason for consultation in acute non-traumatic abdominal surgery. In our study, abdominal pain was found in 98% of patients, along with other functional signs such as vomiting and cessation of gas. Other studies have reported similar results [10-12].

Ultrasound and unprepared abdominal X-rays remain the most commonly performed imaging examinations in emergencies for patients with non-traumatic abdominal pain. In our study, these examinations were performed in 88% and 60% of cases respectively. In the study by Sawane A [10], similar results were obtained with 77.4% d and 60.7% . The privilege accorded to these examinations in our context was explained by their easy accessibility in terms of cost and availability. CT scans and MRIs are often reserved for large hospitals.

Etiology

The etiology of non-traumatic abdominal surgical emergencies are numerous. In the West African region, several studies have concluded that appendicitis and peritonitis predominate [3-16]. Our results concurred with this finding.

In the study by Mequanint Negash (MSC) [12], intestinal occlusion (49.3%) was the main etiology, in contrast to our study where acute appendicitis was the most represented, but this difference was linked to the method of calculation: the Ethiopian team had included strangulated hernias and acute intestinal invaginations in occlusions. In the elderly, our main etiologies (strangulated hernia, acute appendicitis and peritonitis) were comparable to those of Lebeau *et al*., [11], who reported (29.19%) strangulated hernia, 16.7% appendicitis and 23.35% peritonitis, with p values of (0.596), (0.758) and (0.472) respectively.)

Complications

Emergency abdominal surgery is prone to multiple complications, often unpredictable, due to several factors (insufficient exploration of the field, uncertainties in diagnosis, inadequate patient preparation). Our overall complication rate (16%) was higher than that of Sawane A [10], (4.9%) (p:0.0003). This disparity could be linked to the environment, with financial difficulties leading to delays in treatment and the precarious nutritional status of patients in rural areas. In elderly subjects, our complication rate (8.3%) was comparable to that of Lebeau R *et al*., [11]. (23.35%) (p :0.22); similarly, in patients aged 16 and over, 15.24% was close to that of Ananivi Sogan *et al*., [17], 8.11% (p :0.025).

Lethality

Post-operative mortality is a major accident in a surgical unit in a rural environment, where the surgical act is a source of great anxiety, despite the explanations given to parents. The battle to reduce it becomes a daily challenge. Our overall mortality rate was 3%, comparable to the 4.4% reported by IRVIN T. T *et al*., [7], and the 4% of Mequanint Negash (MSC) *et al*., [12].

We recorded (8.3%) deaths in the over-60s, comparable to 10.21% in Lebeau R *et al*., [11]. (p :0.31). This increase in the death rate with age in abdominal emergencies was consistent with the literature [7].

Our pediatric death rate of 2.37% was close to the results obtained by Moustapha Helle *et al*., [16]. (6.1%) (p: 0.395).

CONCLUSION

Non-traumatic abdominal surgical emergencies are a frequent reason for admission to the surgical unit at the kolondiéba referal heath center. The post-operative complication rate is high. Improving the technical level in terms of personnel and equipment could help improve the prognosis.

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