

Acute Peritonitis at the Reference Health Center of Commune I of the District of Bamako: Epidemiological, Clinical and Therapeutic Aspects

Toukara Cheickna^{1*}, Samake Hamidou², Maïga Amadou³, Cisse Alou Hamadoun¹, Diarra Issaka¹, Sanogo Modibo¹, Togola Modibo¹, Dembele Bakary Tientigui³, Traore Alhassane³, Togo Pierre Adegne³, Kante Lassana³

¹Department of General Surgery, Cs Ref of Commune I of Bamako, Bamako, Mali

²Central Directorate of Social Service of Army Health, Bamako, Mali

³Department of General Surgery, Gabriel Toure University Hospital, Bamako, Mali

Email: *tounk_ch@yahoo.fr

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Abstract

Acute peritonitis is most often secondary to perforation of the digestive organ and/or the spread of an intra-abdominal septic focus. The objectives of this work were to study acute peritonitis in the general surgery department of the Cs ref of commune I in Mali, to determine the frequency of peritonitis, to describe the epidemiological, clinical and therapeutic aspects in order to analyze the surgical consequences and to assess the additional cost of treating acute peritonitis. This study was prospective, descriptive, cross-sectional involving 40 patients received in the surgery department of the Cs ref of commune I for acute peritonitis from January 1, 2018 to December 31, 2018. There were 40 patients among whom 28 (70%) were men and 12 were women (30%), *i.e.* a sex ratio = 2.3. The average age was 25 years with extremes varying between 16 and 54 years and a standard deviation of 11.78. Abdominal pain was the main reason for consultation. Clinical examination alone made it possible to make the diagnosis in 75% of cases. Surgical treatment depended on the intraoperative etiology. The clinical diagnosis was supported by ASP and abdominal ultrasound; performed respectively in 10% and 90% of patients. Appendiceal peritonitis was the intraoperative diagnosis observed in 50% of cases. All our patients benefited from a peritoneal toilet with drainage. We noted a morbidity rate of 5% dominated by parietal suppuration. The average cost of care was 175,000 FCFA.

Keywords

Acute Peritonitis, Epidemiology, Diagnostic, Therapy, Surgical Emergencies, Cs Ref CI, Bamako, Mali

1. Introduction

Acute generalized peritonitis is an acute inflammation of the peritoneum [1]. It is a common surgical pathology resulting in a therapeutic emergency and occupies 3rd place in digestive surgery emergencies in Africa after acute appendicitis and occlusions [2] [3].

In the USA: 17% of appendectomies were complicated by peritonitis with a mortality of 0.4% and morbidity of 0.3% to 5.1% in 2004 [4] [5].

In France: Peritonitis due to STIs, 80% by *Neisseria gonorrhoea* in 2008 [6].

In Germany: 58% of deaths in 36 patients with severe peritonitis [7].

In Asia: The prognosis was 70% to 80% death in the event of multi-organ failure at the time of the intervention in 2004 [8].

In Africa: The frequency varied from 28.1% in Congo to 49% in Niger with a mortality of 20.98% and morbidity of 49% in 2005 and 2006 [9] [10] [11].

In Burkina Faso: The late arrival of patients at the hospital coupled with a long and complex procedure contributed to an increase in mortality in 1999 [9].

In Tunisia: Risk factors (age over 65 years; associated defects; signs of shock) must benefit from a simple and rapid surgical procedure to avoid an additional risk of post-operative complications in 2000.

In Morocco: In 2005 the prognosis can be improved by urgent and multidisciplinary care combining early diagnosis, emergency exploratory laparotomy and well-adapted early resuscitation [10].

In Mali: The frequency of acute peritonitis was 7.4% in 2015 [12]. The diagnosis of acute peritonitis is essentially clinical; radiological examinations and imaging can help with the diagnosis. Laparoscopy plays an important role in the diagnostic and therapeutic management of peritonitis [3]. The prognosis depends on age, etiology, time to diagnosis, early treatment and long duration of interventions.

Management is multidisciplinary early and well adapted [5] [6].

Given the high number of this pathology in the health center and the lack of evaluation of the frequency over a period of one year, we decided to do this work to contribute to improving care. To properly conduct this study, we set ourselves objectives.

2. Research Methodology

This prospective cross-sectional study runs from January 1, 2018 to December 31, 2018 in the general surgery department of the Reference Health Center of Commune I of Bamako. We collected 40 cases of acute peritonitis.

- Inclusion criteria:

Any patient who had surgery for acute peritonitis and was treated in the general surgery department of the Cs Ref of commune I during the study period.

- Non-inclusion criteria:

All patients received for peritonitis and not operated on; all patients operated on elsewhere or for other causes in the surgery department of Cs Ref C I of the Bamako district.

The variables studied were sociodemographic (age, sex, profession, residence); physical examination (general, functional, physical signs); additional examinations (ultrasound, abdominal x-ray without preparation); emergency biological assessment (Hemoglobin level, Hematocrit, Rhesus group, Prothrombin level, Cephalin Kaolin time, Blood sugar) and surgical treatment: technique and short and medium term operative consequences.

The media used were the patients' medical files, the outpatient consultation and hospitalization registers, recording the patients' reports, the individual investigation sheet and the anesthesia protocol.

The data were analyzed and entered with SPSS software version 25. Word processing was done with Word software version 2016 and ENDNOTEX software. 9 was used for the management of bibliographic references. The comparison of the texts was made by the Chi square statistical test with $P < 0.05$.

3. Results

We carried out 1420 consultations; 485 hospitalizations; 180 patients admitted urgently; 386 surgical interventions including 40 cases of acute peritonitis or 2.82% of consultations; 8.25% of hospitalizations; 22.22% of emergencies and 10.36% of interventions carried out in the general surgery department of the Cs ref of commune I of Bamako in Mali. The average age was 25 years (age range 16 to 25 years = 65%) with the extremes of 16 and 54 years and a standard deviation of 11.78. The sex ratio was 2.3 (**Table 1**). More than half of our patients (77.5%) were seen urgently (**Table 2**). The average duration of disease progression before admission was 2 days, or 72.5% of cases. Abdominal pain was the reason for consultation in 97.5% of cases and was involved in IDF in 47.5% of cases. This abdominal pain was of gradual onset (77.5%), stinging type (57.5%), intense (37.5%) and without irradiation (40%). Fever associated with vomiting were the most frequent accompanying signs (52.5%), vomiting (87.5%) and cessation of materials and gases (5%) (**Table 3**). The physical signs were dominated by abdominal contracture (92.5%), defensiveness (75%), navel cry (87.5%), bulging Douglas fir (87.5%) and abdominal silence (95%) (**Table 4 & Table 5**).

Abdomen without preparation was performed in 10% of patients and ultrasound in 90% of patients whose result was in favor of acute peritonitis (44%), moderate effusion (30%), liver abscess. ruptured (8%) and appendiceal peritonitis (6%). Appendiceal peritonitis (50%) constituted half of the diagnosis found intraoperatively (**Tables 6-8**).

Medical treatment was based on analgesics (Perfalgan and/or Acupan

Table 1. Sociodemographic data.

	Sociodemographic data	Effective	percentage
Age	15 years to 25 years	20	50
	26 years to 35 years	8	20
	36 years to 45 years	5	12.50
	46 years and over	7	17.50
Sex	Male	22	55
	Feminine	18	45
Occupation	Household	9	22.50
	Trader	6	15
	Breeder	1	2.50
	Artisan	5	12.50
	Farmer	1	2.50
	Pupil/Student	9	22.50
	No occupation	9	22.50
Origin	Bamako	29	72.50
	Outside of Bamako	11	27.50
Total		40	100

Table 2. Distribution of patients according to mode of admission and level of education.

	Admission method and level of education	Effective	Percentage
Admission method	Emergency	22	55
	Referred	16	40
	Ordinary consultation	2	5
Educational level	Primary	13	32.50
	Secondary	3	7.50
	Superior	2	5
	Koranic school	1	2.50
	Uneducated	21	52.50
Total		40	100

parenterally), antibiotics (ceftriaxone 80 to 100 mg/kg/day in two doses, metronidazole infusion 30 mg/kg/day \times 2 and gentamicin 3 to 5 mg/kg/day \times 2) and rehydration in all our regular patients. The transfusion was done in 5 of our patients or 12.5% of cases. The midline above and below the umbilical route was the surgical approach used (77.5%) and the extended Mc Burney (22.5%). The surgical technique used was appendectomy with burial (62.5%), end-to-end anastomosis resection of the small intestine (2.5%) and excision-suture of perforations (12.5%). The peritoneal fluid collected was frank pus in 77.5% of cases

Table 3. Distribution of patients according to reason for consultation and accompanying signs.

Reason for consultation/Accompanying signs		Effective	Percentage
Reason for consultation	Abdominal pain	36	90
	Fever	2	5
	Abdominal meteorism	2	5
Accompanying signs	Vomiting	34	34/40
	Fever	35	35/40
	Nausea	28	28/40
	Constipation	1	1/40
	Rectorgia	1	1/40
	Cold sweat	13	13/40
Total		40	100

Table 4. Distribution of patients according to pain characteristics.

Pain characteristics		Effective	Percentage
Type of pain	Sting	20	50
	Burn	16	40
	Twist	2	5
	Gravity	1	2.50
	Crushing	1	2.50
Mode of onset of pain	Progressive	23	57.50
	Brutal	17	42.50
Evolution of pain	Permed	29	72.50
	Intermittent	10	25
	Undetermined	1	2.50
Pain irradiation	Posterior	4	10
	Ascendant	3	7.50
	FID	21	52.50
	Umbilical peri	39	97.50
	Epigastric	17	42.50
	Generalized	40	100
Duration of pain	Without irradiation	30	75
	1 to 2 days	2	5
	>2 days	38	95
Total		40	100

Table 5. Distribution of patients according to accompanying signs and triggering factor.

Associated signs and triggering factor		Effective	Percentage
Associated signs	Vomiting	34	85
	Fever	35	87.50
	Nausea	28	70
	Constipation	1	2.50
	Recectorgia	1	2.50
	Cold sweat	13	32.50
Triggering factor	Meal	2	5
	Hunger	1	2.50
	Stress	4	10
	Effort	2	5
	None	31	77.50
Total		40	100

Table 6. Distribution of patients according to physical signs.

Physical signs	Number	Percentage
Generalized contracture	39	97.50
Pain on palpation	35	87.50
Decreased abdominal breathing	37	80
Abdominal silence	30	75
Abdominal meteorism	5	12.50
Abnormal dullness	38	95
Localized Defense	30	87.50
Tympanism	2	5
Cry of the navel	39	97.50
Painful rectal exam with bulging Douglas	38	95
Painful vaginal touch	15	37.50
Abdominal mass	2	5
Foul leucorrhoea on TV	15	37.50

Table 7. Distribution of patients according to paraclinical diagnosis, bacteriology result and ASA classification.

Dg. Paraclinical/Bacteriology/ASA		Effective	Percentage
Ultrasound	Not done	4	10
	Done	36	90
Abdomen without ASP preparation	Hydro-aerial levels	3	7.50
	Diffuse grayness	1	2.50
Bacteriology	Presence of germs	35	87.50
	No germs	5	12.50
ASA I		38	95
ASA II		2	5
Total		40	100

Table 8. Treatment and early operative outcomes.

Treatment and early post-operative outcomes		Effective	Frequency
Approaches first	Median above and below umbilical	19	47.50
	Median subumbilical	21	52.50
Operating technique	Appendectomy	21	52.50
	Ileostomy	2	5
	Suturing the perforation	13	32.50
	End-to-end anastomosis	4	10
Aftermath of surgery	Simple	35	87.50
	Parietal suppuration	4	10
	Death	1	2.50
Total		40	100

with the presence of germs in 26% of cases. The Mannheim score was less than 26 in all our patients. The outcome was simple in 95% of our patients and the morbidity rate (infection of the surgical site) was 5%.

The average cost of care was 175,000 FCFA.

4. Discussion

We carried out a prospective descriptive cross-sectional study from January 1, 2018 to December 31, 2018 which included 40 patients operated on for acute peritonitis. Patients were identified from consultation, operative report, anesthesia, hospitalization registers and the individual survey form. Acute peritonitis (22.22%) in surgical emergencies constituted the 2nd cause of emergencies in general surgery compared to 60% of acute appendicitis. This frequency is comparable to that of Dissa B.A. [13], (21.14%) in Mali and Harouna Y.D. in Niger [14], (28.8%); significantly higher than that of Lorand I. [1], (3%). This difference could be linked to the high frequency of infectious diseases on the one hand and on the other hand to a delay in consultation, diagnosis and upstream management of the main conditions in question. Our average age (25 years) is comparable to that of Ouengré E. [15], (24.34 years with $P = 0.939010$, $\text{Chi}^2 = 0.01$) in Burkina Faso and Dissa B.A. [13], (24 years with $P = 0.900799$) in Mali but statistically different from that of Gougard P. [16], (48 years with $P = 0.005349$) in France and Mallé O.A. [17], (32 years with $P = 0.616524$). Studies have reported a higher frequency in men than in women [4] [18].

Our sex ratio was 2.3 in favor of men; gender is not a risk factor. The frequency of functional signs differed according to the authors [19]; linked to etiologies, delay in consultation and the stage of progression of the disease. Abdominal pain (97.5% of our patients) remains the dominant functional sign according to several authors [4] [13]; other characteristics of pain have value in diagnostic guidance [11]. Vomiting (2/3 of patients, *i.e.* 87.5%), food, bilious or fecal, was statistically comparable to that of Dissa B.A. [13] in Mali with a rate of

78% $P = 0.198076$ but significantly lower than that of Mallé O.A. [17], 53% $P = 0.0190076$ in Mali; Rahman G.A. [14], 60% $P = 0.001066$ in Niger. This vomiting reflects the expression of a paralytic ileus, responsible for dehydration and hydro-electrolyte disorders. The cessation of materials and gases indicates early or late frank intestinal paralysis [12]. The 5% of our series are different from the 40% of Dissa B.A. ($P = 0.000044$) in Mali. The general signs correlated with the severity of peritoneal contamination [9], fever (50% of patients), corroborate with the data in the literature [13] [17]. On physical examination, abdominal contracture (92.5%) is the major sign; localized or generalized defense, the semi-ological meaning is the same [2] [17]. This rate does not differ from those in the literature [8] [12] [17].

In the ASP, the pneumoperitoneum in the form of a gaseous interhepato-diaphragmatic crescent [13]; this crescent was observed in 5% of our patients. It varies between 8% and 71% in the literature [9] [14] [19], linked to the etiology; the absence does not eliminate digestive perforation [18]. Hydro-aerial levels were found in 5% of our patients, statistically different from the 47.5% ($P = 0.000001$ $\chi^2 = 24.30$) of Harouna Y.D. [14] in Niger in 2001 but comparable to 7.5% of Mallé [17] in Mali in 2015. The harmless abdominal ultrasound was performed in 36 patients or 90% of cases, of which 33% of cases were appendicular. This result is comparable to 35.29% of Mallé O.A. in Mali in 2015 with $P = 0.813089$, $\chi^2 = 0.01$; significantly lower than that of Dissa B.A. in Mali (70.45%, $P = 0.000045$, $\chi^2 = 16.65$).

In Europe, the main etiologies of acute peritonitis represented by digestive perforations (appendicitis, UGD, intestinal diverticulosis, cholelithiasis, abdominal trauma and digestive tumors) [15] [19], are noted in African series [13] [14] except for rare intestinal diverticulosis in Africans. Typhoid fever and its digestive complications are common in Africa; rare in Europe [16]. Appendiceal peritonitis was our first etiology (50%), as was the case with Mallé O.A [17], 52.5% with $P = 0.070400$ and Pomata M. [20] in Italy, but third cause with Kambiré J.L. [18]. 19% with $P = 0.44036$ in 2017 in Burkina Faso. Perforation of peptic ulcer, second cause in our study (12.5%) corroborates with that of Mallé O.A. (12.5%) in 2015.

Resuscitation aimed to correct the hydro-electrolyte and hemodynamic disorders [14]. This resuscitation was brief in our series (2 to 3 hours) and simple (essentially filling with solutes). Antibiotic therapy composed of a combination of beta-lactams and imidazoles, possibly supplemented by an aminoglycoside, corresponded to the scheme of Le Treut Y.R. [19]. We used triple antibiotic therapy based on (Ceftriaxone 1 g + Metronidazole 500 mg + Gentamicin 80 mg) subsequently modified and adapted according to the antibiogram. These associations have been used by other authors [9] [13] [14] [20].

The surgical approach was median incisions above and below the umbilical and xipho-pubic straddling the umbilicus justified by the need for washing and drainage by certain authors [11] [13] [14] [17], as in our series. The morbidity

rate (5%) in our series is comparable to the 13.5% of MALLE A. O. [17] in Mali and significantly lower than the data from Niger and Tunisia [9] [10]. This could be linked to the size of the sample and the developmental stage of the patients. Mortality was zero in our study. This mortality varies between 11.11% to 15.70% in African series [11] [14] [17].

5. Conclusions

Acute generalized peritonitis constitutes a frequent surgical emergency. An improvement in the technical platform, sufficient health coverage and health education could reduce the frequency of hospitalization. They affect young people; 20 patients out of the 40 cases of peritonitis were young people.

The etiologies are multiple and varied but appendicular perforation remains the primary cause with 20 out of 40 cases, hence the need for close interdisciplinary collaboration.

The diagnosis is mainly clinical and the treatment is medical-surgical. Correct resuscitation could improve the prognosis. Mortality is high and is mainly linked to delay in consultation.

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Conflicts of Interest

There is no conflict of interest.

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