Journal of Surgery
Kouakou KB, et al. J Surg 7: 1469
www.doi.org/10.29011/2575-9760.001469
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Research Article

Diffuse Acute Peritonitis of the Elderly in a Low West African Area

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Citation: Kouakou KB, Traoré M, Anzoua KI, Leh Bi KI, N'Dri AB, et al. (2022) Diffuse Acute Peritonitis of the Elderly in a Low West African Area. J Surg 7: 1469 DOI: 10.29011/2575-9760.001469

Received Date: 01 February, 2022; **Accepted Date:** 08 February, 2022; **Published Date:** 14 February, 2022

Abstract

Purpose: To identify the causes of acute diffuse peritonitis in the elderly and to report the results of their treatment. **Patients and methods:** Retrospective and analytical study of patients aged 65 and over, operated between january 2013 and december 2019 for acute diffuse peritonitis at the Bouake University Hospital. Demographic, diagnostic, therapeutic and evolutionary data have been described and analyzed. **Results:** The study involved 45 patients with a mean age of 72±2.4 years (range 65 and 92 years). Thirty-six patients (80%) had a history and co-morbidities. The main reason for consultation was abdominal pain (77.8%) followed by stool and gas cessation. Perforation of gastric or duodenal ulcers (44.4%), complicated appendicitis with or without perforation (22.2%) and ileal perforation (20%) were the main causes. The average length of hospital stay was 8.7 days (range: 4 and 35 days). Surgical morbidity was 33.7%, dominated by parietal suppurations. Mortality was 14.4%. Peri-operative shock was the main cause (20%). This mortality was significantly related to the ASA score and to the peri - operative shock. **Conclusion:** Diffuse acute peritonitis in the elderly is immediately serious because of its fragility. The mortality is not higher than that reported in the literature. The prognosis of these patients could be improved by appropriate early resuscitation.

Keywords: Diagnosis; Diffuse acute peritonitis; Elderly; Mortality; Surgery

Introduction

In view of the ageing of the world's population, it is not unusual to encounter elderly patients in surgical emergencies for an acute abdomen [1-3]. Given the often-limited technical platform for diagnostic exploration and surgery, operating on the elderly in emergency becomes a major challenge for the african surgeon [4,5]. Morbidity and mortality are high [5,6]. However, most of the african series published, seem to confirm the irrelevance of a certain reluctance to perform emergency surgery on elderly patients [4-8]. Age is not a contraindication to emergency surgery. These series, like the developed countries series, highlight the particular fragility of the elderly subject due to ageing but also to the existence of often disabling co-morbidities [5,8-10]. Acute diffused peritonitis in such a patient is immediately serious. Is the elderly patient operated on for this indication with limited means not exposed to an additional postoperative risk? To our knowledge, in Ivory Coast, particularly in Bouake, no study dealing with the specific question of the management of acute generalized peritonitis in the elderly has been published. The aim of this work was to identify the causes of diffuse acute peritonitis in the elderly and to present the results of their surgical treatment.

Patients and Method

This was a retrospective and analytical study of data collected from the records of patients aged 65 years and over, operated on for diffuse acute peritonitis between January 2013 and December 2019 in the general and digestive surgery department of the University Hospital Center (UHC) of Bouake. Patients with postoperative peritonitis were not included. They were divided into geriatric (65-74 years), elderly (75-89) and very elderly (≥90).

Demographic, diagnostic, therapeutic and treatment outcome data were statistically described. Morbid post-operative complications and deaths were considered, both during hospitalization for patients without a stoma and until restoration of digestive continuity for patients with a stoma. Epi Info 7.2.1.0 dfr, Microsoft Excel 2016 and IBM SPSS statistics 25.0 for Windows were used for data compilation and statistics. The impact of demographics (age, sex, co-morbidities), diagnosis (American Society of anesthesiologist (ASA) score, delay in consultations, necrosis of digestive tract), post-operation (delay in intervention, peri-operative shock, stay in intensive care, morbid complications) on the rate of mortality was assessed. The X^2 test was applied for categorical variables and standard deviation or Student's t-test for quantitative variables. The significance threshold was set at 5% for all tests. Anonymity and confidentiality were respected for all patients.

Results

Demographic Data

In 7 years, 45 subjects, including 28 men and 17 women (sex ratio = 1.6), aged 65 and over, underwent surgery for diffuse acute peritonitis. They represented 10.6% of the 426 patients operated on for the same condition in the same period. The average age was 72±2.4 years (extremes: 65 and 92 years). They were divided into geriatric (68.8%), elderly (26.6%) and very elderly (4.4%). Thirty-six patients (80%) had a history and co-morbidities. Some had several at the same time (Table 1).

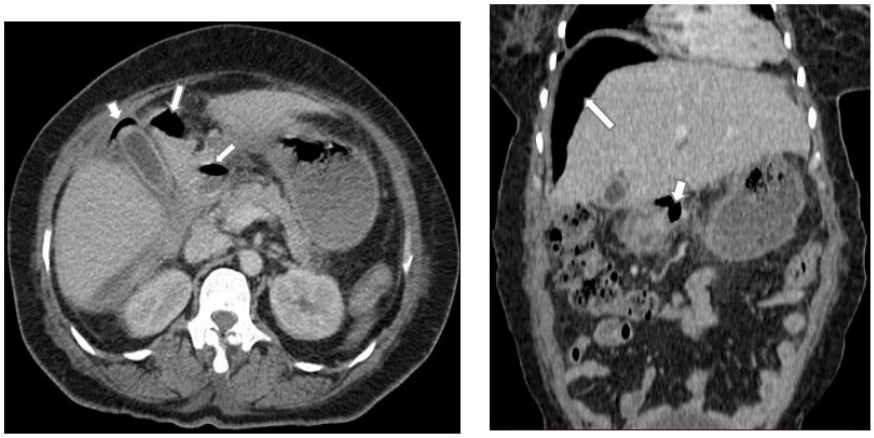
History and co-morbidities		Number	Percentage (%)
Médical	Cardiovascular (hypertension, stroke, heart disease)	15	41,7
	Gastric or duodenal ulcer / Epigastralgia	10	27,8
	Bronchial / Lung Disease	05	13,9
	Lumbosacral disease	05	13,9
	Diabetes	04	11,1
	Haemorrhoidal disease	03	8,3
Surgical	Laparotomy	10	27,8
	Prostate adenoma	04	11,1
	Adenomectomy	02	5,5

Table 1: History and co-morbidities (n= 36).

Diagnostic Data

The reasons for consultation were abdominal pain (n= 35; 77.8%), stool and gas cessation (n= 28; 62.2%), nausea and/or vomiting (n= 26; 57.8%), fever (n= 25; 55.5%) or diarrhea (n= 06; 13.3%). These signs were sometimes associated. The average consultation time was 4.2±2.1 days (extremes: 1 day and 14 days). It was greater than 2 days for 36 patients, i.e. 80%. Patients were classified as ASA I (n= 7; 15.5%), ASA II (n= 20; 44.4%), ASA III (n= 15; 33.3%) and ASA IV (n= 3; 6.6%). Physical signs included provoked abdominal pain (n= 35; 77.8%), parietal defence (n= 26; 57.8%), fever (n= 25; 55.5%) or hypothermia (n= 08; 17.8%) and jaundice (n= 1; 2.2%). Imaging was performed in 40 cases (88.8%). These included an unprepared abdominal X-ray (n=34; 75.5%) (Figure 1), abdominal ultrasound (n=5; 11.1%) and abdominal CT scan (n=2; 4.4%) (Figure 2). The causes of the peritonitis were gastric perforation (n= 20; 44.4%), appendicular peritonitis (n= 10; 22.2%), ileal perforation of typhoid origin (n= 9; 20%), vesicular perforation (n= 3; 6.6%), ruptured liver abscess (n= 2; 4.4%) and primary peritonitis (n= 1; 2.2%).

Figure 1: Diffuse scatter (frame) on a frontal AP x-ray of a 71-year-old patient with ileum perforated peritonitis.



a: Axial section of abdominal CT scan

b: Frontal section of abdominal CT scan

Figure 2: Pneumoperitoneum (arrows) on an abdominal CT of a 69-year-old patient with a gastric perforation.

Therapeutic data

All patients underwent resuscitation and antibiotic therapy on admission and continuing during and after the operation. This involved a bi-antibiotic therapy (3rd generation cephalosporins, imidazole derivative) associated with an aminosid in case of sepsis with normal diuresis. Prophylactic heparin therapy was given to all patients. Its duration was 8 days on average (extremes: 2 and 21 days). The mean time to surgery was 12.8±10.4 hours (range: 2 hours and 24 hours). The surgical treatment of the lesions is summarized in Table 2.

Diagnostic	Number	Surgical treatment
Perforation of gastric or duodenal ulcer*	20	Excision - suture + Toilet - drainage
Appendicular peritonitis**	10	Appendicectomy + Toilet - drainage
Ilium perforation	09	Resection - stoma + Toilet - drainage
Gallbladder perforation	03	Cholecystectomy + Toilet - drainage
Ruptured liver abscess	02	Toilet - drainage
Primitive peritonitis	01	Toilet – drainage
*Gastric perforation (n= 17); duodenal perforation (n=3). **Perforated appendix (n= 8); not perforated appendix (n= 2)		

Table 2: Surgical treatment according to diagnosis.

Outcomes of surgical treatment

Four patients (8.9%) stayed in intensive care immediately after the surgery for haemodynamic instability (n=1), seizure (n=1), delayed recovery (n=1) or cardiac arrest (n=1). The average postoperative hospital stay was 8.7 days (extremes: 4 and 35 days). Twenty-one patients (46.6%) had morbid complications. The surgical complications (n= 15; 33.3%) were parietal suppuration (n= 6), subphrenic abscess (n= 3), parietal bleeding (n= 2), gastric fistula (n= 2), stomal necrosis (n= 1) and evisceration (n=1). Re-operation was required in 8 cases.

Six patients (13.3%) died. Their characteristics are shown in Table 3.

Age (year)/ Sex	History/ Comorbidities	ASA	Diagnostis	Surgery	Date of death	Cause of death
69/F	Gastric or duodenal ulcer	III	Gastric perforation	Excision - suture	Per - opérative	Hypovolemic shock
70/M	Laparotomy	IV	Ileum perforation	Resection - stoma	D20	Septic shock + Severe malnutrition
74/M	Inguino-scrotal hernia	III	Gastric perforation	Excision - suture	D15	Post-operative peritonitis
75/F	Stroke	IV	Gastric perforation	Excision - suture	D1	Hypovolemic shock
80/F	Gastric or duodenal ulcer	III	Gastric perforation	Excision - suture	D1	Hypovolemic shock
80/M	HTA	IV	Ileum perforation	Résection - stoma	D5	Decompensated heart failure + Severe renal failure

Table 3: Characteristics of deceased patients (n= 06).

In univariate analysis, shock and ASA stages ≥ III were the risk factors for mortality (Table 4).

Parameter		Number	Deaths	Alive	Percentage	P
Age	65-75	31	3	28	9.6	0.3564
	≥75	14	3	11	21.4	
Sex	M	28	3	25	10.7	0.6581
	F	17	3	14	17.6	

Medical co-morbidities	Yes	36	6	30	16.6	0.3230
	No	9	0	9	0	
Delay of consultation	< 48 h	9	1	8	11.1	10.000
	≥48 h	36	5	31	13.8	
ASA	I ; II	27	0	27	0	**0.0022**
	III ; IV	18	6	12	33.3	
Delay d' intervention	< 6 h	6	0	6	0	0.5758
	≥ 6h	39	6	33	15.3	
Postoperative ICU stay	Yes	4	2	2	9.7	0.0799
	No	41	4	37	8	
Pre-operative shock	Yes	9	4	5	44.4	**0.0103**
	No	36	2	34	2.7	
Post-operative morbidities	Yes	21	5	16	23.8	0.0831
	No	24	1	23	4.1	

Table 4: Risk factors for operative mortality.

Discussion

Over a period of 7 years, 10.6% of patients operated on for diffuse acute peritonitis were aged 65 years and over. This rate is lower than those in which can exceed 20% [11-13]. This difference reflects one of the particularities of african populations compared to european populations. Indeed, like other african countries, the ivorian population is young [14,15]. It is therefore this young population that is frequently encountered in our emergencies [5-8]. In the developed countries, by contrast, populations are ageing [14]. This increase in life expectancy in the these countries is accompanied by an increased rate of elderly subjects attending abdominal surgical emergency departments [16,17]. These populations, generally in their eighties, are predominantly female, thus reversing the sex ratio [13,14,18]. Our study population is predominantly geriatric (65 - 74 years; 68.8%). In this age group, men are still the most numerous (sex ratio= 1.6). In emergency conditions, the detection of a surgical cause in front of a painful abdomen is not always easy in the elderly[2,3,6]. Anamnestic information is often difficult to collect due to a rapidly deteriorating general condition or the deterioration of a pre-existing cognitive impairment [19]. The physical signs are sometimes just as frustrating. For example, fever, provoked pain and parietal defence may be missing [11,12,20-22]. Wroblewski et al observed in the elderly, a melting and atrophy of the abdominal wall musculature making a defence almost undetectable [11]. As for Lesourd et al, they observed a progressive thymic involution with age. This involution would lead to a decrease in the production of immune agents and in the immune and inflammatory response [22]. Ageing therefore makes the elderly a special clinical entity [18]. The contribution of imaging, particularly abdominal CT, is indisputable for the diagnosis of lesions in the acute abdomen of the elderly patient [23,24]. In our study, fever or hypothermia (73.3%), abdominal pain (77.8%) and parietal defence (57.8%), cardinal signs of acute peritonitis, were almost constant in the clinical examination. Paralytic ileus, characterized by stool and gas cessation (62.2%) and nausea or vomiting (57.8%), in this context, is a sign of severity. After this clinical check-up, the prescription of an emergency abdominal CT scan is recommended [23,24]. However, we did not have one in our hospital. In such conditions, we felt it was appropriate to make the diagnosis of acute peritonitis and to indicate an emergency surgical exploration. Perforation of gastric or duodenal ulcers was the most frequent cause of diffuse acute peritonitis, unlike in developed countries series where it is rare [2]. Okubo et al reported 83.3% of cases due to colonic perforation versus 13.9% due to gastric or duodenal perforation. In their study, perforated cancer was involved in 36.1% of cases [13]. For Wroblewski et al, intestinal necrosis by mesenteric infarction was the main cause. Ulcer perforation came only in 4th position [11]. Ulcers were either known or suspected by our patients in the presence of epigastralgia treated by self-medication, often with gastro-toxic drugs. Systematic fibroscopy of epigastralgia and education against self-medication could reduce the incidence of gastric or duodenal ulcer perforation. The second most common cause of diffuse acute peritonitis was appendicitis followed by ileal perforation of typhoid origin. These three main causes of

acute diffuse peritonitis are found in the african literature [4-8]. The impoverishment of the population could be one of the factors favoring them. The choice of surgical treatment carried out in our series depended on the intraoperative findings, the general condition of the patient, the technical facilities available and the surgeon's experience. Laparotomy was the only approach used; our hospital was not equipped with laparoscopy. The outcome of this surgical treatment was marked by a high morbidity and mortality. This result is consistent with the literature [1,5,7,17,25]. The operative morbidity (33.3%) was dominated by parietal suppuration. This is an almost constant complication of emergency abdominal surgery [6-8,13,17,25]. It could be prevented by better control of the peri-operative microbial ecosystem. The surgical mortality was 13.3% with the main cause being hypovolemic or septic shock. This high rate of mortality has also been reported by several authors [11,13,26,27]. Rausei et al reported 53.4% [25]. In their study, deaths were not significantly related to age, but to co-morbidities, severity of intra-abdominal sepsis, the injury involved and the need for emergency re-operation. Other factors such as male gender, time of admission, cognitive impairment, presence of mesenteric infarction or associated malignancy with metastases have been reported [1,13,19,27]. In our series, only the ASA score and perioperative shock had a significant impact on the rate of mortality. The delays for consultation (4.2±2 days) and surgery (12.8±10.4 hours) were long. These delays must have contributed to the rapid onset of perioperative shock in these patients, weakened by co-morbidities that are often underestimated in our context. Prognostic scores of mortalities such as the POSSUM score [28] could not be used due to the lack of technical means available in the emergency room. The pathology involved, in particular gastric perforation, not assessed in our analysis of the risk factors for mortality, could be considered. It was the cause of peritonitis in 2/3 of the deceased patients.

Conclusion

The elderly patient is a particular entity characterized by his physical fragility. Diffuse Acute peritonitis in such a situation is immediately serious. As the clinical presentation is often frustrating, the CT scan is essential to the diagnosis. In our practice, the causes are dominated by gastric or duodenal ulcer perforation, appendicular causes and ileal perforation. The rate of mortality did not appear to be higher than that reported in the literature. It was not related to age but to the ASA score and the presence of peri-operative shock. In our context, a more interventional approach could therefore be discussed in a multidisciplinary team. Thus, a control of co-morbidities coupled with an early and adapted resuscitation could improve the prognosis of the patients.

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