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Epidemiological analysis of patients diagnosed with vascular acute abdomen in a complementary care hospital in the city of São Paulo/SP, Brazil: A retrospective study

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ABSTRACT

OBJECTIVE

To evaluate epidemiological, clinical, and prognostic profile of patients with acute vascular abdomen (AVA), framed as acute mesenteric ischemia (AMI) undergoing surgery.

METHODS

Medical records of patients with AMI, who underwent surgery at Hospital Sancta Maggiore, São Paulo/SP, Brazil; between January 2017 to August 2021, were reviewed. For data analysis, the SPSS program version 18.0, independent Student t-test and Chi-square tests were used.

RESULTS

Eighteen patients with a median age of 78 years were selected. The main personal history was hypertension and 63% reported severe abdominal pain on admission. 47% had door-to-surgery time less than 1 day, with surgical time less than 1 hour in 44% of cases. 31% stayed in the ward for more than 7 days and 40% stayed in the ICU for 1 to 3 days. 67% of the patients died. There were no significant differences between severe and extremely severe patients. In the elderly, AVA stands out as a rare condition with high mortality, tends to be more incident and may mimic acute abdomen: obstructive, inflammatory and/or perforative.

CONCLUSION

AVA is a diagnostic and therapeutic challenge with likely future increased incidence. It is up to surgeons to obtain the necessary knowledge to diagnose and treat it to decrease its morbidity and mortality.

DESCRIPTORS

Acute Abdomen, Ischemia, Mesenteric Ischemia, Abdominal Pain.

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INTRODUCTION

The aging of the Brazilian population has been widely addressed and discussed in the national and international scientific sphere, in which its effects added to the reduction of fertility and mortality have been transforming the population age pattern. According to the census of the Brazilian Institute of Geography and Statistics (IBGE), in 2010, the contingent of citizens aged 60 years or older was 20,590,599, representing 10.8% of the general population. The projection for 2050 is that the Brazilian elderly population will exceed 22.7%, a growth that will place Brazil as the sixth most numerous elderly populations in the world1.

Currently, the number of elderly people undergoing several surgical procedures (abdominal, orthopedic, vascular, and plastic surgeries) is expressive, besides surgeries in the digestive tract, especially laparoscopic cholecystectomies[2,3]. Aggressive interventions in cases of malignant diseases, however, are not frequent. Authors also point out that there is reluctance to recommend them because of higher morbidity and mortality in this age group[3].

The term acute abdomen is a generic term, comprising numerous clinical manifestations. The definition of acute abdomen refers to pain in the abdominal region, non-traumatic, sudden onset, variable intensity, associated or not with other symptoms, lasting hours or up to four days, not exceeding seven days and, in most cases, requiring immediate medical intervention, surgical or otherwise[4,5].

In 2002, in the U.S., about seven million patients sought emergency services with abdominal pain, representing 7.5% of total care, and about 50% of them required medical intervention[6,7].

Among the acute abdomen conditions in the elderly population, acute vascular abdomen (AVA) stands out, a condition considered rare, but with a high mortality rate due to mesenteric ischemia[8,9]. Mesenteric ischemia can have severe clinical consequences, leading to intestinal necrosis with intense systemic repercussion, accompanied by sepsis, shock, death, or progression to short bowel syndrome. The diagnosis of AVA should be fast and its treatment should be carried out urgently[10].

Several studies indicate that only 1/3 of patients are correctly diagnosed with acute mesenteric ischemia (AMI) before being submitted to exploratory laparotomy or evolving to death. These data demonstrate the relative symptomatological nonspecificity of this disease, characterized by a set of signs and symptoms like other common abdominal pathologies[11]. The physical examination may be inefficient, not revealing signs of peritoneal irritation in the absence of transmural bowel involvement, creating a clinical-propaedeutic disproportion, which sometimes makes diagnosis even more difficult. Reduced hydroaereal sounds may occur due to progression of ischemia because of reduced peristalsis, as well as pain and defense to abdominal palpation secondary to peritonitis[12].

AMI manifests itself through severe abdominal pain, often described as disproportionate to the physical examination findings, followed by acute and unexpected alteration in intestinal transit; it may be accompanied by abdominal distension, nausea, vomiting, and diarrhea[13]. According to prospective studies, vomiting and diarrhea are present in 71% and 42% of patients with AMI, respectively[14].

The aim of this study was to trace the epidemiological profile of patients admitted to a supplementary health network hospital (Hospital Sancta Maggiore_São Paulo/SP, Brazil, specialized in geriatric care) with syndromic diagnosis of AVA, who had a final diagnosis of AMI, correlating clinical data with the prognosis of patients undergoing laparotomic and laparoscopic surgical treatment.

METHODS

Samples, type of study and variables analyzed

This retrospective study was approved by the Research Ethics Committee of the Universidade Santo Amaro, opinion number 4,951,521.

Clinical data from the medical records of patients seen at Hospital Sancta Maggiore (São Paulo/SP, Brazil) between January 2017 and August 2021 were reviewed. Those with a syndromic diagnosis of AVA and acute mesenteric ischemia undergoing surgical treatment were selected for inclusion in the study.

The variables analyzed were gender, age, marital status, surgical prophylaxes, pain scale on admission, surgical port-center time, surgical technique used, associated complaints, personal history, medications in use, abdominal examination, white blood cells, left shift, C-reactive protein, lactate, lactate dehydrogenase, pH Gasometry, time of surgery, surgical intercurrences, tomographic findings, length of stay in ward, length of stay in ICU, type of discharge, attendance at return visit, date after discharge, attendance at emergency room in the last 7 days before surgery, complaints, medications in use by surgery, intercurrences between surgery and return.

Inclusion and exclusion criteria

As inclusion criteria, patients had to have undergone laparoscopic or open surgery for treatment of AMI during the period of analysis. We excluded those medical records that were inadequately or incompletely filled out, without full information and data necessary for the research.

Statistical analyses

The data were analyzed using the SPSS program version 18.0. Median, interquartile range (IIQ), and frequency (represented as %) were used. Extremely severe patients (who went into Open Close) and severe patients were compared by independent Student's t-test and the Chi-square test. Values of $p < 0.05$ were considered significant.

RESULTS

Between January 2017 and August 2021, 473 medical records of patients seen at Hospital Sancta Maggiore_São Paulo/SP, Brazil were evaluated; only 18 patients met the study inclusion criteria. The age of patients ranged from 71 to 86 years (median 78 years), in which all 18 patients (100%) used therapeutic antibiotic therapy and surgical prophylaxis, underwent exploratory laparotomy and underwent contrast-enhanced CT scan (Table 1).

Table 1. General characteristics of the study participants.

Age, median (IIQ), years		**78 (71-86)**
Variables	**Number**	**Percentage**
Antibiotic therapy	18	100%
Surgical prophylaxis	18	100%
Exploratory laparotomy	18	100%
Tomography with contrast	18	100%

IIQ: Interquartile range

Among the main complaints associated with acute vascular abdomen, 89% of patients reported abdominal pain (being the most frequent complaint), 67% nausea and vomiting, 56%

malaise/prostration, and 33% inappetence (Table 2).

Table 2. Complaints associated with acute vascular abdomen.

Symptoms	Number	Percentage
Abdominal pain	16	89%
Epigastralgia	3	17%
Nausea and vomiting	12	67%
Malaise and prostration	10	56%
Inappetence	6	33%
Digestive bleeding	2	11%
Intestinal alterations	9	50%

About the main personal history, 78% reported hypertension, 44% dyslipidemia, 39% diabetes, and 33% heart disease (Table 3).

Table 3. Personal antecedents reported by the patients.

Background	Number	Percentage
Smoking	2	11%
Diabetes	7	39%
Hypertension	14	78%
Dyslipidemias	8	44%
Heart disease	6	33%
STROKE	1	5%

Stroke: Cerebral Vascular Accident.

As for the scale of pain at admission, 63% of patients reported severe pain and 37% moderate pain. The indicator used to evaluate the intensity of the inflammatory process was the deviation to the left in the complete blood count (CBC), where 44% of patients presented this parameter.

As for the comparison between extremely severe patients (who went into Open Close) and severe patients, no significant differences were found for the variables evaluated (Table 4).

Table 4. Comparison between extremely ill patients and critically ill patients.

Variable	
Age	P
Leukocytes	0,69#
C-reactive protein	0,73*
Lactate	0,66*
Blood gases (bicarbonate)	0,15*
Blood gases (pH)	0,76*
Blood gases Basic Excess	0,46*
Time to Surgery	0,76*
#Independent Student t-test; *Square test	0,11*

Regarding length of stay in the ward, 37% did not stay in the ward (therefore, not applicable), 19% stayed in the ward between 1 and 3 days, 13% from 3 to 7 days, and 31% more than 7 days. For door-to-surgical center time, 47% stayed less than 1 day, 18% stayed 1 day from door-to-surgical center, and 35% waited 2 days. With respect to ICU length of stay, 11% did not require admission (therefore, not applicable), 33% stayed less than 1 day, 40% stayed 1 to 3 days, 5% stayed 3 to 7 days, and 11% stayed more than 7 days.

The time of surgery, days after discharge, and type of discharge were also evaluated. Less than 1 hour of surgery corresponded to 44% of the patients, the same for the duration of 1 to 2 hours, and 12% of the surgeries lasted 2 to 3 hours. The number of deaths corresponded to 67% of the participants, 5% were discharged within 6 days, and 28% from 8 to 14 days.

Bicarbonate, pH, and Basic Excess concentrations were between 10 and 15 mmol/L for 27% of the participants, the same for concentrations between 15 and 20 mmol/L; 20 to 24 mmol/L were found in 20% of the individuals, and 26% had concentrations above 24 mmol/L. Regarding pH, 40% had values below 7.35 (acidosis), 40% were in the normal range (between 7.35 and 7.45), and 20% were in alkalosis (above 7.45). As for the Basic Excess, 20% were below -10 mol/L, 40% between -10 and -4 mol/L, and another 40% between -4 and +4 mol/L.

DISCUSSION

Acute vascular abdomen (AVA) is a diagnostic challenge, considering that to date, there is no specific and rapid marker exclusively intended for the syndrome[2,10]. The diagnosis involves clinical aspects, which are nonspecific or absent depending on the patients' previous morbidities, possible sequelae, and frailty. Some laboratory criteria are promising and useful, but they can still lead to other diagnoses. Currently, abdominal CT angiography (CT angiography) represents the most accurate method for diagnosis[13]. It is noteworthy that the use of radiological protocols depends on the health services. When a CT scanner is available, without the ct angio protocol, abdominal CT with intravenous contrast may be helpful, but with lower sensitivity and specificity rates, which hinders or delays the diagnostic elucidation[12].

Abdominal pain, observed in 89% of those analyzed in this study, quantified as strong by 63% and disproportionate, comparing the complaint with the findings of the abdominal physical examination, should be considered, raising the degree of suspicion of the diagnostic hypothesis when an elderly patient, or an extremely elderly patient with morbidities, seeks emergency care, especially if associated with changes in vital signs. The presence of nausea, vomiting, intestinal changes such as diarrhea, malaise and prostration, although nonspecific, are part of the clinical spectrum of the condition and in this study, they are in accordance with the current literature[10,16].

Considering the general characteristics of the patients analyzed, the mean age of 78 years reinforces the involvement of the geriatric population and signals the pathology that tends to increase with the aging population. Importantly, all patients underwent surgery, which was a criterion for inclusion in the study, and the 18 patients included underwent exploratory laparotomy (EL).

From the epidemiological point of view, the literature points out similarities between genders[13,17], not observed in this study, possibly related to the profile of patients seen in the analyzed period. The comorbidities found in 78% of patients with hypertension, 44% with dyslipidemia, 39% with diabetes and 33% with heart disease are expected in the disease.

Laboratory tests, the elevated leukocytosis observed in almost all patients, the significant deviation to the left in a little less than half of the cases studied, and the elevated alterations in C-reactive protein point to an exacerbated inflammatory process, which probably accentuated the repercussion in the patient's hemodynamics. Acidosis, present in 40% and should be well evaluated with arterial blood gas analysis and its developments. Bicarbonate consumption (BIC) and Basic Excess (BE) may be more indicative in the diagnostic aid, but more studies are needed for its use specifically for AVA.

It is estimated that there is a strong correlation between the times of diagnosis and management definition for better prognosis and survival of patients, but there is no valid scientific documentation about what these times would be for AVA. We studied the times related to the admission of the patient and his performance of the surgical procedure. Called door-to-surgery time, it was identified that practically half of

the patients took less than 24 hours from the time they were admitted to the emergency room to the surgical procedure.

As for the performance of the surgical procedure, it is inferred that this patient, in most cases, will present clinical instability, and will depend on skillful and accurate surgical technique. 44% of the cases were operated in less than 60 minutes, the same rate for procedures between 60 and 120 minutes. It is important to emphasize that in extremely severe patients, the intraoperative finding was a condition that configures abdominal tragedy, in which there is global ischemia with necrosis of the entire small intestine and sometimes the large colon, incompatible with life, which closes the patient's prognosis. In Brazil, to date, there are no feasible and accessible therapeutic options in this context of AVA, which is commonly called open close, in these cases the surgical procedures are shorter[7,18]. This study presented the occurrence of 7 cases with this condition.

Considering the clinical severity associated with decreased physiological reserves already found in most patients, practically all patients required intensive support in the postoperative period, only 11% did not require intensive care; and this time ranged between 1 and 3 days in 40% of cases, 33% remained only 1 day having clinical outcome in death, which are the extremely severe patients whose surgical treatment was not therapeutic (open close). Of the patients who were discharged to the room, 35%, the majority, had a length of stay longer than 7 days, showing a prolonged and costly hospitalization for the system; it is expected for this clinical condition that the hospital discharge, when passable, occurs later compared to other diseases, we identified discharge between 8 and 14 days in 28% of patients. AVA, despite being rarer than others, is responsible for a large portion of deaths observed in acute abdomen syndrome; mortality ranges from 60 to 65%[19]; in the present study, mortality was 67%.

No variables with statistical significance were identified to predict the evolution of the patient to the extremely severe condition, incompatible with life (open close) with the critically ill patients, who have possible surgical resources. As for the surgical techniques used, only one case presented clinical conditions for videolaparoscopy, which was used for diagnosis; in the other cases, the conventional technique was used, by median incision. Total and partial colectomies were performed in 8 patients, and enterectomies in 6. A stoma was needed in 5 patients. Almost half of the patients were hemodynamically unstable intraoperatively, and one death even occurred on the operating table. Three patients left the surgery with a short bowel condition (less than 70% remaining small bowel). All these data reinforce the severity of the disease and its high morbidity and mortality rate.

During the clinical evaluation, before the surgical procedure, almost half of the patients were hemodynamically unstable, and half had no peritonitis, indicating the disproportionate clinical propedeutics of the disease. In the same proportion, the abdomen was described as painful on superficial palpation, but without findings of peritonitis. Signs, which in general are more suggestive of obstruction, were also identified on physical examination, especially distention.

Computed tomography with intravenous contrast, as already mentioned, especially as a protocol for cT angiography, is a strong ally for proper diagnosis and the main means by which the conduct to be taken is defined20. The analyses show that in all patient contrast was administered, in 6 patients mesenteric artery occlusion was documented. 66% of patients had free fluid and 27% had signs of loop distress (pneumatosis intestinalis). Considering that the cited findings were present simultaneously in the same patient, the radiological information greatly assists in the diagnosis. Fifty percent of the patients also presented signs of semi-occlusion or bowel obstruction that could be misinterpreted, leading to inappropriate diagnosis and management in the context of AVA.

CONCLUSION

AVA remains a diagnostic and therapeutic challenge, currently considered rare, and its incidence is likely to increase as the geriatric population increases worldwide. The complaint of severe pain with disproportionate physical examination should be widely investigated in the elderly in association with blood count, CRP, lactate, LDH and above all arterial blood gas. It is inferred that time is a determining factor for favorable prognosis, anatomical factors in relation to the network of vessels and collateral vessels, systemic inflammatory response and most likely some explanations not yet known, should indicate which patient can evolve to tragic outcome with open close. Accurate diagnosis is essential for adequate treatment and to reduce the high morbidity and mortality rate associated with AVA.

REFERENCES

1. IBGE. Síntese de indicadores sociais. Vol. 39, I. 2016. 1–63 p.
2. Dare AJ, Ng-kamstra JS, Patra J, Fu SH, Rodriguez PS, Hsiao M, et al. Deaths from acute abdominal conditions and geographical access to surgical care in India : a nationally representative spatial analysis. Lancelat Glob Heal. 2015;3(10):646–53. doi: 10.1016/S2214-109X(15)00079-0.
3. Cappell MS. Intestinal (Mesenteric) Vasculopathy I: Acute Superior Mesenteric Arteriopathy and Venopathy. Gastroenterol Clin North Am. 1998;27(4):783–825. doi: 10.1016/s0889-8553(05)70033-9.
4. Yasuhara H. Acute Mesenteric Ischemia: The Challenge of gastroenterology. Surg Today. 2005;35:185–95. doi: 10.1007/s00595-004-2924-0.
5. Jia Z, Jiang G, Tian F, Zhao J, Li S, Wang K, et al. Early endovascular treatment of superior mesenteric occlusion secondary to thromboemboli. Eur J Vasc Endovasc Surg. 2014;47(2):196–203. doi: 10.1016/j.ejvs.2013.09.025.
6. Flasar MH, Eric G. Acute Abdominal Pain. Med Clin North Am. 2006;90(3):481–503. doi: 10.1016/j.mcna.2005.11.005.
7. Meneghelli UG. Elementos Para O Diagnóstico Do Abdômen Agudo. Med (Ribeirao Preto Online). 2003;36(2/4):283.
8. Savassi P, Andrade J, Souza C. Abdomen Agudo: Diagnóstico e Tratamento. In: Medsi. 1993. p. 255–61.
9. Bobadilla JL. Mesenteric Ischemia. Surg Clin North Am. 2013;93(4):925–40. doi: 10.1016/j.suc.2013.04.002.
10. Silva J, White C. Ischemic Bowel Syndromes. Prim Care Clin Off Pract. 2013;40(1):153–67. doi: 10.1016/j.pop.2012.11.007
11. McKinsey J, Gewertz B. Acute Mesenteric Ischemia. Surg Clin North Am. 1997;77(2):307–18.
12. McCarthy E, Little M, Briggs J, Patel R, Bratby MJ. Radiology and Mesenteric ischaemia. Clin Radiol. 2015;70(7):698–705. doi: 10.1016/j.crad.2015.02.012.
13. Wyers M. Acte Mesenteric Ischemia: Diagnostic Approach and Surgical Treatment. Semin Vasc Surg. 2010;23(1):9–20. doi: 10.1053/j.semvascsurg.2009.12.002.
14. Hmoud B, Singal AK, Kamath PS. Mesenteric Venous Thrombosis. J Clin Exp Hepatol [Internet]. 2014;4(3):257–63. Available from: http://dx.doi.org/10.1016/j.jceh.2014.03.052
15. Kolkman J, Geelkerken R. Diagnosis and treatment of chronic mesenteric ischemia: An update. Best Pract Res Clin Gastroenterol. 2017;31(1):49–57.
16. Brandt LJ, Boley SJ. AGA Technical review on intestinal

ischemia. American Gastrointestinal Association. Gastroenterology. 2000;118(4):954–68.
17. Reinus J, Brandt L, Boley S. Ischemic diseases of the bowel. Gatroenterology Clin North Am. 1990;19(2):319–43.
18. Brunetti A, Scarpelini S. Abdômen Agudo. Med (Ribeirao Preto). 2007;40(3):358.
19. Acosta S. Epidemiology of mesenteric vascular diase: clinical implications. Semin Vasc Surg. 2010;23(1):4–8. doi: 10.1053/j.semvascsurg.2009.12.001.
20. Renner P, Kienle K, Dahlke M, Heiss P, Pfister K, Stroszczynski C, et al. Intestinal ischemia: current treatment concepts. Langerbecks Arch Surg. 2011;396(1):3–11.