

Tracer indicators in patients with acute surgical abdomen

Abstract

Introduction: The tracer indicators are elements to be taken into account by the surgical services to know the morbidity and mortality in the non-traumatic acute abdomen.

Objective: To describe the characteristics of tracer diseases in the non-traumatic acute abdomen in the General Surgery service of the Manuel Ascunce Domenech University Hospital in Camagüey.

Methodological design: A cross-sectional longitudinal descriptive observational study was carried out in 657 patients. The data came from the medical records and were processed using descriptive statistics, relating some variables in a non-inferential way.

Results: 60.6% of the patients were men. 30.7% were between 40 and 59 years old. There were 334 patients with symptom evolution time between 24-47 hours. 42.5% presented acute appendicitis. There were 29.2% complications, 66.1% of them were infectious. Mortality was 10.2%. 37.3% of the deceased presented pulmonary thromboembolism, 50.7% presented intestinal occlusion. The reoperation and readmission rates were 5.3% and 7.6%, respectively.

Conclusions: The study of tracer diseases shows that: Almost a tenth of the patients died, being pulmonary thromboembolism the cause of the deaths. The time of evolution greater than 24 hours, infectious complications, ages over 40 years and intestinal occlusion as a cause of acute abdomen seemed to influence the mortality of the sample studied. Evisceration and infection of the operative site were the causes of admissions and reoperations.

Keywords: acute abdomen, tracer diseases, morbidity and mortality

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Héctor Alejandro Céspedes Rodríguez

Department of General Surgery, University of Medical Sciences of Camagüey, Cuba

Correspondence: Héctor Alejandro Céspedes Rodríguez.
Department of General Surgery, University of Medical Sciences of Camagüey, Cuba, Tel 58360607,
Email hcespedesr03@gmail.com

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Introduction

According to Kessner¹ (a tracer disease (or illness) should meet the characteristics of a significant functional impact, easy diagnosis, high prevalence, change substantially with medical care, have widely accepted management criteria, and be understood in the epidemiological context.¹ There is no a specific list of tracer indicators but rather that these have to be established at the appropriate place and time A tracer is defined as “a specific health problem that, when combined in sets, allows health care evaluators to determine weaknesses and strengths of a specific medical practice or of a network of health services.”²⁻⁴ The use of indicators is and will continue to be useful for hospital administrators, health authorities and for all those who in one way or another are linked to the improvement of the Health Sector and with hospitals in particular, they provide fast, easy and concise valuable information about how the hospital in question is performing and allow comparisons across time and space that would otherwise be impossible.^{5,6}

There is no specific list of tracer diseases, but these must be established in the appropriate place and time, but identifying and monitoring them brings us closer to raising the quality of medical care for these patients. There are no reports on diseases that are tracers of the acute abdomen. This classifies any acute abdominal condition that requires urgent treatment, most of the time, surgical treatment, and continues to be the first cause of emergency surgical intervention in general surgery services.^{1,3,4} What are the characteristics of the tracer diseases in the non-traumatic surgical acute abdomen in the General Surgery service of the “Manuel Ascunce Doménech” University Hospital in Camagüey, in the period between January 2014 and August 2018?

Methodological design

A prospective observational study was carried out at the Manuel Ascunce Domenech University Hospital in Camagüey with the objective of describing the tracer diseases in the acute surgical abdomen in patients admitted and treated in the General Surgery Service in the period of time between September 2014 and August 2018. The sample consisted of 657 patients who underwent surgery, who presented entities corresponding to an acute abdomen and whose medical records were available in the Hospital Statistics Department and who showed the necessary data to carry out the present investigation, constituting these the inclusion criteria. Those patients with mental illnesses, or who for some reason did not want to be part of the study were excluded. The data were obtained from the medical records that constituted the secondary source of information and were emptied in a form prepared by the author and that constituted the primary source of information. The variables were studied: age groups, sex, time of evolution of the symptoms, causes of the acute abdomen, surgical time, presence of post-surgical complications, presented complications, hospital stay, state at discharge and causes of death, reintervention and the reentry.

Information processing and analysis methods. The data were processed on a computer with an Inside Pentium processor with the statistical package SPSS, version 15.0 for Windows, and are expressed according to descriptive statistics, in tables.

Results (Table 1)

It is observed that 279 patients presented acute appendicitis as the cause of the acute abdomen, followed by intestinal occlusion with 186 patients, representing 42.5% and 28.3% respectively.

Table 1 Distribution of patients according to causes of acute abdomen

Causes of acute abdomen	No.	%
Acute appendicitis	279	42.5
Intestinal occlusion	186	28.3
Acute cholecystitis	139	21.2
acute pancreatitis	17	2.6
Ectopic pregnancy	9	1.4
Mesenteric thrombosis	8	1.2
Pelvic peritonitis	7	1.1
perforated diverticulitis	5	0.8
Complicated ovarian cyst	5	0.8
perforated ulcer	2	0.3
Total	657	100

Source: Clinical history.

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Of the 67 deceased patients, 23 patients presented as direct cause of death pulmonary thromboembolism, which represents 34.3% followed by septic shock with 21 patients representing 31.3% of the study sample 1 (Table 2).

Table 2 Distribution of patients according to cause of death

Cause of the acute abdomen of the deceased.	No.	%
Intestinal occlusion	34	50.7
acute pancreatitis	11	16.5
Acute cholecystitis	9	13.4
Mesenteric thrombosis	8	11.9
perforated diverticulitis	3	4.5
perforated ulcer	1	1.5
Acute appendicitis	1	1.5
Total	67	100

We appreciate that the main cause of acute abdomen in the deceased was intestinal obstruction with 34 patients, followed by acute pancreatitis with 11 patients. The main cause of readmissions was surgical site infection followed by evisceration (Tables 3–5).

Table 3 Distribution of the deceased according to the cause of the surgical acute abdomen

Cause of reintervention.	No.	%
evisceration	13	37.2
Anastomotic Dehiscence	11	31.4
Intra-abdominal abscess	9	25.7
Postoperative bleeding	2	5.7
Total	35	100

Table 4 Distribution of patients according to cause of reintervention

Reason for readmission	No.	%
Surgical site infection	37	74
evisceration	9	18
Bronchopneumonia	2	4
Pulmonary embolism	1	2
Intra-abdominal abscess	1	2
Total	50	100

Source: Medical records

Table 5 Distribution of patients according to reason for readmission

Causes of deaths	No	%
Pulmonary embolism	23	34.3
Septic shock	21	31.3
Multi-organic failure	11	16.5
Acute Myocardial Infarction	7	10.4
Mixed Shock	5	7.5
Total	67	100

Discussion

The non-traumatic acute abdomen is usually the most frequent cause of emergency surgery in adult patients, and this entity has always been a reason for investigation. The causes of non-traumatic acute abdomen are diverse and change in order of frequency according to age group, sex and region. In geriatric patients, according to the medical literature, they are intestinal occlusions of non-hernial and hernial causes, acute cholecystitis, perforated ulcer, acute appendicitis of the latter, there is the idea that it is a condition typical of young people, but in a work published by Céspedes et al 5, in 2020 it was found that 28% of appendicitis occurs in the elderly and that the clinician often does not suspect it. And in non-geriatric patients acute appendicitis predominates, cholecystitis especially in females and those older than 40 years of age. In our series there is a predominance of acute appendicitis with 279 patients for 42.5%; followed by intestinal occlusions with 28.3% (186 patients) within this, occlusion by flanges or adhesions ranked first followed by colon cancer and hernias. We agree with many authors who point to intestinal obstruction as the first cause of acute surgical abdomen in the elderly, although in different proportions and for different reasons.^{6–9}

This may be because adhesions are responsible for at least 65% of intestinal obstructions. Of these, more than 80% are post-surgical and 15% have an inflammatory cause. Numerous studies reveal that 65 to 90% of patients who develop this entity had previous abdominal surgery, especially in the lower abdomen and gallbladder. In our population, in general, there is a decrease in bile duct diseases and hernia entities as causes of surgical abdomen, occupying lower positions in our health system, similar to first world countries.

Table 2 shows the distribution according to discharge status and the distribution according to causes of death, respectively. In the sample studied, 10.2% of the patients died, a relatively high figure when compared to works where their samples were larger than ours, such as that of the authors.^{3,5,7,12} The fundamental causes of death in the study were pulmonary thromboembolism followed by septic shock, the latter caused by fibrinopurulent peritonitis and bronchopneumonia,

with the causes of death accumulating among them in more than half of the deceased. This coincides with that reported by most of the studies on the subject that coincide in relating its appearance with the etiology of the intestinal obstruction as well as the age and comorbidities of the patients.^{6,8} The aforementioned coincides with the study by Marchena et al.,⁶ finding pulmonary thromboembolism followed by septic shock as the first cause of death in the General Surgery service. Figueroa et al.,⁷ found pulmonary thromboembolism and severe exudative peritonitis as a direct cause of death with a mortality rate of 4.1%, considered low. Sánchez et al.,⁸ found a mortality rate of 7.7%, mainly attributable to generalized infection and septic shock. The largest number of deceased patients diagnosed with pulmonary thromboembolism were found in the general surgery service, followed by the intermediate care unit and the intensive care unit, with an average of 21.1%, 11.3% and 4.9%, respectively.

This may be related to the fact that in our service there is no prophylaxis protocol for deep vein thrombosis and thromboembolism, which is considered a tracer and quality index in surgical services due to its high mortality. Mortality rates in emergency surgery are significantly lower than in past decades. However, it is suggested that mortality gradually increases with age, going from 2.3% in patients between 40 and 49 years of age to 4.4%; 6.8 and 8% respectively in the seventh, eighth and ninth decades, regardless of the severity of the disease or the nature of the intervention.

Table 3 shows the distribution of patients who died according to the cause of the acute abdomen, where intestinal obstruction was the main cause of death, in which patients aged 60 years and over predominated, with the presence of infectious and non-infectious complications, with the Pulmonary thromboembolism and septic shock were the direct cause of the deaths, coinciding with Quédrago cited by Céspedes et al.⁵ where in their study intestinal occlusions predominated, however, we do not coincide with authors from Camagüey 20, 40, where in their study intestinal perforations predominated with 44.1%, followed by intestinal occlusion, but an author from our center did give intestinal occlusion as the main causes of deaths and this may be due to the fact that in the elderly intestinal obstruction is the main cause of acute abdomen and is causing serious disorders of the hydromineral and acid-base balance, losses of added proteins and hypoproteinemia present in the great majority of elderly patients, there are also states of intra-abdominal hypertension; that could reach a compartment syndrome, this due firstly to the distention of the loops and then to the edema of the intestinal loops due to the resuscitation attempts, higher rates of bacterial translocation than in other pathologies of the acute abdomen.

This seems to affect the overall mortality of this surgical entity. In our study, in non-geriatric patients, acute appendicitis ranked first, followed by acute cholecystitis, with a predominance of this in females. We can say in a global way that the two emergency surgical entities that predominate in our center are acute appendicitis and intestinal occlusion, the latter being the one that presented the highest mortality due to non-infectious complications and the infectious one (surgical site infection) predominated in appendicitis. acute. Therefore, an indicator to take into account in our service is mortality caused by intestinal obstruction; as well as deaths from esophageal atresia, an indicator of quality in pediatric surgery services.

Despite technological advances, the morbidity and mortality of abdominal reinterventions remains high. In the last 30 years, there have been more publications regarding abdominal reinterventions, in different surgical circumstances and after various procedures.^{2,4,7,11} Of the 35 reoperated patients, the highest percentage corresponded

to the female sex (52.4%), which slightly predominated over males (47.6%), which differs slightly from studies such as those by Prado 9 et al., Sartelli¹⁰ et al., Quintana¹¹ et al. However, there are many who believe that gender is not an element to be taken into account in the rate of reinterventions, giving greater interest to age.

The percentage of abdominal reinterventions found was 5.3% (35 patients), a figure similar to that reported in the series by Céspedes et al.¹² with 5.3%, Sartelli et al.¹⁰ with 5.8% and Prado et al.⁹ with 6.4%. Other authors report higher figures for reinterventions in very heterogeneous patient groups, such as that of Quintana et al.¹¹ with 10.6%. Authors such as Akkapulu et al.,¹³ report an index of 5.7%, although other authors report a greater number of reinterventions in their series, reaching up to 10%. La Rosa, et al.,¹⁴ found in 13,025 surgeries an index of 1.3% of reinterventions. In the study, the rate of reinterventions was 2.03%. Regarding reinterventions, La Rosa et al.,¹⁴ cites that in series from the United States of America and Spain, it comprises approximately 2.5% of the initial operations. As far as reintervention is reconsidered as a quality indicator, the exposed results coincide with an acceptable index. In Cuba, according to the doctoral thesis of Dr. Julio R. Betancourt Cervantes reported by Vargas et al.¹⁵ in abdominal surgery the risk of major complications (re-laparotomy) is 1.4 x 100 interventions in general and 3.1 x 100 interventions in emergency surgery. Emergency abdominal surgery obtained the highest percentage of abdominal reinterventions with 71.9% in our center. The results of the work by Hutchins et al.¹² report 80% of abdominal reinterventions secondary to emergency surgeries: the figure in the study by García et al.¹¹ is higher with 83.33%. The medical indication for which the need to reoperate on patients was most frequently considered was evisceration and anastomosis dehiscence (68.6%). In general, the incidence reported in prospective studies is usually higher than that reported in retrospective studies, taking into account the above, the incidence reported in the literature can vary between 0.2 and 6%, with mortality rates that can reach Four. Five%. Said by J.D. Norris in 1939: "The sad comment on the present state of knowledge of evisceration, is that the literature continues to report an almost unchanged incidence through the years", could still be considered valid today.

Many risk factors for this complication are well known: age over 65 years, hemodynamically unstable patients, factors that increase intra-abdominal pressure, urgent nature of surgery, infectious processes, hypoproteinemia, anemia and obesity. Today there are two scores in the world to predict Van Ramshorst evisceration reported by Jensen et al. Mentioned by Gutierrez et al.¹⁷

The foregoing does not coincide with the study by Céspedes et al.¹² which first indicates intra-abdominal collection, which is the highest percentage of reintervention indications. Numerous studies mention evisceration as the complication that generates more relaparotomies in intermediate care patients. Anastomotic dehiscence occurred in 19.04% (second place in the indications for reintervention), which contrasts with what was reported by Prado et al.⁹ who presented it in the first place, with 36%. The main causes of reintervention may vary from one series to another, but they all agree that evisceration, intra-abdominal collection and anastomosis dehiscence account for three quarters of it, with an overall incidence of 65 to 85%. Mortality due to abdominal reoperation varies from 13 to 100% in relation to the conditions of the patient, but in those without systemic sepsis at the time of reoperation it is 13%; in those with sepsis and multiple organ failure, it is 50% and in patients with diffuse peritonitis and multiple organ failure it rises to 100%. In the national and foreign bibliography, this topic is infrequently addressed; however, in Cuba rates of abdominal reinterventions are cited between 1.3 and 2.6%

in general surgery services, 10.6% in intermediate surgery therapy rooms and up to 17% in intensive care units.

Within the surgical services, the main causes of readmission unanimously are care-related diseases; Surgical site infection (SSI) and pneumonia are the ones that occupy almost all of them. In our study, 7.6% (50 patients) of the total number of cases treated were readmitted, the main cause being infection of the surgical site, with 76% within this, deep-type infection predominated and only one case presented space collection as a cause of readmission, this coincides with what was recently expressed on the subject, since infectious causes are the ones that generate the most readmissions in the surgical services, they occupy the third position globally, the infections of the operative site and not in the general surgery services, where they occupy the first row. . More than half of the readmitted patients were 60 years of age and older, followed by the group between 40 and 59 years of age, and the vast majority underwent surgery with diagnoses of acute appendicitis and intestinal occlusion.

The risk of acquiring an infection increases according to the severity of the patient and the complexity of the care; in surgical patients, this risk is intensified due to the potential contamination inherent in any invasive procedure. The usual incidence of surgical site infections probably does not reflect reality, given the short institutional stay of the patient, which restricts epidemiological surveillance of SSIs for the hospitalization period^{1,8} and makes the diagnosis of surgical site infections frequent. at readmission^{4,7,9,15} Post-discharge surveillance could detect up to 84% of SSI diagnoses, mainly in short-stay surgeries, and represents the central point of an effective infection-associated control program to medical services. The results of post-discharge surveillance improve the underestimated rates and could be a starting point for the identification of procedures that represent a greater risk for SSIs, guiding prevention and control actions⁸.

A cohort study with patients undergoing elective surgeries, Rodríguez et al.¹⁸ observed that 58% of the infections were diagnosed after discharge and of these, 10.8% at the time of readmission and 23.1% through of the emergency service.¹¹ Superficial SSIs that appear shortly after discharge are often not reported. Those deeper infections, of organs and cavities have a more reliable detection since they require professional evaluation and readmission, allowing a higher proportion of notifications 100-109. Readmissions for complications of previous hospitalization in the emergency service are approximately 25% and more than 80% of these adverse events are secondary to surgical procedures.^{7,10,11} Two thirds of surgical wound infections were due to emergency surgery and acute appendicitis as its cause.

Conclusions

The main cause of surgical acute abdomen was acute appendicitis. There was an important number of complicated patients, being the infectious complications and within these the infection of the surgical wound the most found disorders. Almost a tenth of the patients died, with pulmonary thromboembolism and septic shock being the most frequent causes of death. Intestinal occlusion as a cause of acute abdomen could influence mortality in the sample studied. Evisceration was the most frequent cause of reintervention, as well as surgical site infection, the cause of readmissions in almost all cases.

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Conflicts of interests

Author have declared that no conflicts of interest exists.

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