Outcome of antibiotic treatment in patients with abdominal trauma at the hospital in Ceilândia

Rolando Gutierrez Rosales[1], Jandui Gomes de Abreu Filho[2], Karoliny Araujo Santana[3], Nailton Gomes da Silva[4], Déborah de Fatima Diniz Rocha[5], Mozart Borges de Paula[6], Bruno Bessa Andrade[7], Kenyan Correa Rosa[8] and Matheus Savindo Batista Sanches[9]

ABSTRACT

Infections generate complications capable of causing morbidity and mortality in trauma patients. As a measure to prevent infections, the administration of antibiotics should be early. However, the use of antibiotics for a long time is not recommended, since there is no evidence of a favorable outcome, in addition to increasing health care costs. Due to the need to prevent infections in trauma patients, it is important to adopt strict control measures with the implementation of effective strategies to improve health care for these patients. The aim of this study was to evaluate the impact of antibiotic use in trauma patients in a hospital in Brasilia. This research is an observational cross-sectional investigation, based on a retrospective approach through the extraction of data from the health information system "TrackCare". The participants of this research comprise patients with abdominal trauma who underwent surgical treatment from January to December 2021. It is observed that almost half of the 93 patients were assigned to receive antibiotic therapy or antibiotic prophylaxis. Within this selected group, the main antimicrobial agent chosen was Unasyn, a combined composition of Ampicillin with Sulbactam, covering approximately 31% of cases. In this context, it is urgent to consider that the selection of the antimicrobial agent is not only based on its efficacy, but also on its adequacy to the particularities of the clinical picture presented by the patient.

Keywords: Antibiotic, Infections, Abdominal trauma, Surgical treatment.

[1] Resident in General Surgery, Ceilândia Regional Hospital, Brasília, DF, Brazil.
[2] Professor, General Surgery Residency, Ceilândia Regional Hospital, Brasília, DF, Brazil.
[3] Student at Centro Universitário Tocantinense Presidente Antônio Carlos. Araguaína, Tocantins, Brazil.
[4] Student at Centro Universitário Tocantinense Presidente Antônio Carlos. Araguaína, Tocantins, Brazil.
[5] Student at Centro Universitário Tocantinense Presidente Antônio Carlos. Araguaína, Tocantins, Brazil.
[6] Physician, graduated from the Catholic University of Brasília, Brasília, DF, Brazil.
[7] Physician, graduated from UNICEPLAC Centro Universitário, Brasília, DF, Brazil.
[8] Physician, graduated from UNICEPLAC Centro Universitário, Brasília, DF, Brazil.
[9] Physician, graduated from UNICEPLAC Centro Universitário, Brasília, DF, Brazil.

INTRODUCTION

Infections generate complications capable of causing morbidity and mortality in trauma patients. These conditions are included in the trimodal distribution of trauma, established in 1982, which relates time to the outcome of trauma patients, and shows that one of the causes of late mortality in trauma victims is complications resulting from sepsis and organ dysfunction. Therefore, although the traumatic mechanism is not, by itself, capable of generating death in patients, infectious complications can lead to death (Junior, 2016).

The first peak occurs in the immediate post-trauma, seconds or minutes later, due to the extent and degree of the lesions in the brain and spinal cord, in addition to the great vessels. The second peak occurs within minutes or hours of post-trauma, triggered by contusions in the chest, brain hematomas, liver and splenic lesions, and in the pelvis. This time requires a thorough and rapid initial assessment, identifying and treating potentially fatal factors. Thus, due to the need for effective assessment, it is important to follow the recommendations of the Advanced Trauma Life Support® (ATLS). The third peak, in days or weeks post-trauma, is due to sepsis and multiple organ failure (American College of Surgeons, 2009).

A study carried out in a hospital in southern Brazil observed the impact of infections on patients affected by trauma, demonstrating that, of the total number of patients treated, more than 15% contracted some infection during hospitalization. Of this total, 28.8% died, and almost all had systemic inflammatory response syndrome (HAI), and sepsis increases the risk of death in patients by up to 12 times, compared to those who did not contract infection (Watanabe et al, 2015).

As a measure to prevent infections, the administration of antibiotics should be early. However, the use of antibiotics for a long time is not recommended, since there is no evidence of a favorable outcome, in addition to increasing health care costs. Therefore, the decision of the class of antibiotic to be used in trauma surgeries depends on the type of injury, the time of installation and the tissue affected (Rivera, 2008).

Due to the need to prevent infections in trauma patients, it is important to adopt strict control measures with the implementation of effective strategies to improve health care for these patients. The aim of this study was to evaluate the impact of antibiotic use in trauma patients in a hospital in Brasilia.

METHODOLOGY

This research is an observational cross-sectional investigation, based on a retrospective approach through the extraction of data from the health information system "TrackCare". The participants in this research comprise patients with abdominal trauma who underwent surgical

treatment from January to December 2021, whose data were acquired without direct intervention or individual follow-up.

Considering the population of Ceilândia, estimated at 349,955 inhabitants (IBGE, 2018), it was established that approximately 123 participants were needed to achieve a confidence level of 90%, with a margin of error of 6%. Thus, for the selection of data to be analyzed, the inclusion criterion of patients with abdominal trauma who underwent exploratory laparotomy at the Regional Hospital of Ceilândia (HRC) during the referred period was adopted, excluding those who underwent exploratory laparotomy for other causes or in different periods.

Regarding the conduction of the research, the following steps were followed: submission to the Research Ethics Committee (REC), data collection through medical records, data tabulation, analysis of results, discussion and conclusion.

Data collection took place at the Regional Hospital of Ceilândia (HRC) through electronic medical records, after the informed consent form was waived. The following variables were analyzed: age, gender, cause, use of antibiotics, antibiotic therapy, duration of antibiotic therapy, days of hospitalization, and clinical outcome. The data were processed and analyzed using the IBM SPSS software (version 22.0).

RESULTS

Table 1 reflects the demographic data, in which age is described using the mean and standard deviation variables, while the gender of the individuals with abdominal trauma is presented in terms of absolute values (n) and percentages (%). Notably, there is a predominance of male patients, with an average age of 30 years.

Table 1 - Age and gender of the patients

Variable	Average	±
Age	30,04	10,703
Gender	n	%
Male	83	89,2
Female	10	10,8

Source - Data from the study itself (2024)

When analyzing the cause of the occurrences (Table 2), of the 93 patients studied, almost half of them were victims of Stab Wound Perforation (PAB). Other etiologies identified include Perforation by Firearm (PAF) with 30.1%, car and motorcycle accidents that together account for 15.1% of the cases, falls with 2.2% and being run over by a car with 1.1% of the patients studied.

Table 2 - Cause of occurrences:

Cause	n	%
HELP	46	49,5
YOUTH	28	30,1
Motorcycle accident	8	8,6
Car accident	6	6,5
Blunt Trauma	2	2,2
Is left	2	2,2
Hit	1	1,1

Source - Data from the study itself (2024)

Tables 3 and 4 present data on antibiotic use and therapeutic choices. Initially, it is observed that almost half of the 93 patients were assigned to receive antibiotic therapy or antibiotic prophylaxis. Within this selected group, the main antimicrobial agent chosen was Unasyn, a combined composition of Ampicillin with Sulbactam, covering approximately 31% of cases. In addition, other frequently chosen substances included Meropenem (8%), the combination of ciprofloxacin with metronidazole (8%), and Tazocin (5.7%), which consists of piperacillin with tazobactam.

Table 3 - Antibiotic use

Antibiotic use	n	%
Yes	43	46,2
No	47	50,5
No registration	3	3,2

Source - Data from the study itself (2024)

Table 4 - Antibiotic therapy chosen:

Antibiotics	n	%
Unasyn	27	31
Meropenem	7	8,0
Ciprofloxacino + Metronidazol	7	8,0
Tazocin	5	5,7
Vancomycin	4	4,6
Linezolid	2	2,3
Piperacilina + Tazobactan	2	2,3
Meropenem + Linezolida	2	2,3
Early	2	2,3
Ciprofloxacino + Clindamicina	2	2,3
Levofloxacina	2	2,3
Tigecycline	2	2,3
Polymyxin B	2	2,3
Meropenem + Vancomicina + Ertapenem	1	1,1
Metronidazole	1	1,1
Imipenem + Amicacina	1	1,1
Ciprofloxacino	1	1,1
Clindamycin	1	1,1

Source - Data from the study itself (2024)

Finally, the last variable examined was the duration of treatment with the antibiotics mentioned (Table 5). In this context, a wide range of periods was observed, ranging from a minimum of 1 day to a maximum of 22 days. This remarkable disparity is attributed to the interaction of several elements, such as the dosage of the drug itself, the severity of the clinical condition, and the underlying reason for therapeutic choice. Thus, the presentation of the results in absolute values was not feasible, due to the variation in the duration of treatment with the same medication. To represent the data, we chose to calculate the mean of the days of treatment, together with the standard deviation, in order to contextualize the amplitude of this temporal variation.

Table 5 - Duration of antibiotic use:

Antibiotic time (days)	Average	±
Unasyn	4,56	2,225
Meropenem	16,29	6,473
Ciprofloxacino + Metronidazol	4,43	2,573
Tazocin	6,20	1,304
Vancomycin	11,75	7,320
Linezolid	15,00	0,00
Piperacilina + Tazobactan	7,00	2,828
Meropenem + Linezolida	7,50	0,707
Early	12,50	12,021
Ciprofloxacino + Clindamicina	4,00	1,414
Levofloxacina	14,00	4,243
Tigecycline	16,00	1,414
Polymyxin B	18,00	8,485
Meropenem + Vancomicina + Ertapenem	22,00	–
Metronidazole	1,00	–
Imipenem + Amicacina	8,00	–
Ciprofloxacino	13,00	–
Clindamycin	8,00	–

Source - Data from the study itself (2024)

DISCUSSION

In this study, an analysis of the prognosis of patients living in Ceilândia who underwent antibiotic therapy after suffering abdominal trauma was undertaken. The results revealed a myriad of findings of significance, which require in-depth consideration.

Initially, the preponderance of demographic data deserves to be highlighted, showing an average age of 30.04 years, with an exacerbated predominance in males, reaching an expressive proportion of 89.2%. In this scenario, Perforation by a Knife (PAB) emerges as the most prevalent cause, making up 49.5% of the cases, followed by Perforation by Firearm (PAF), responsible for

30.1% of the incidences, among other relevant etiologies. Nevertheless, it emerged that the administration of antibiotic agents in the therapeutic management of patients affected by abdominal trauma at the hospital in Ceilândia obtained a percentage of almost half of the patients (46.2%).

It should be noted that Unasyn was positioned as the most recurrent pharmacological therapy, obtaining a preference of 31% in the aforementioned study, and boasting one of the lowest mean duration of treatment, approximately 4.56 days. However, it is important to emphasize that the study shows the existence of other therapeutic agents with shorter treatment periods, however, underused in the region in similar contexts.

In this context, it is urgent to consider that the selection of the antimicrobial agent is not only based on its efficacy, but also on its adequacy to the particularities of the clinical picture presented by the patient, considering factors such as bacterial resistance, safety profile, and cost-effectiveness. In addition, it is imperative to investigate the underlying reasons for the underutilization of therapeutic alternatives with shorter treatment duration, as this could promote more efficient management of resources and potentially improve clinical outcomes for patients affected by abdominal trauma in Ceilândia.

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