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Review Article

Epidemiological, Clinical, Therapeutic and Evolutionary Aspects of Septic Pathologies at the Surgical Emergency Unit of Joseph Ravoahangy Andrianavalona (JRA) Teaching Hospital Antananarivo (101) Madagascar

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Abstract

Introduction: The surgery of septic pathologies is associated with a high morbidity-mortality. Our objectives are to describe the aspects epidemio-clinics, therapeutic and evolutionary of septic diseases at the Surgical Emergency Unit of Joseph Ravoahangy Andrianavalona (JRA) Teaching Hospital and identify the factors associated with the mortality of patients.

Methods: This was a retrospective and descriptive study carried out in the septic patients admitted to the Surgical Emergency Unit of JRA Teaching Hospital, requiring emergency surgery, over a 12-months period from June 2016 in July 2017.

Results: 286 patients either 10.75% of surgical emergencies were retained. The average age of our patients was 41.3776 +/ - 19, 17 years with male predominance (70.63%). Alcoholism (30.77%), smoking (32.17%) and high blood pressure (21.68%) were the most observed medical history. At admission, the majority of patients had a hyperthermia (53.14%). Four patients or 1.40% had a severe anemia. Hyponatremia was the main ionic anomaly observed. All patients had a hyperleukocytosis. For the severity of the disease, the majority of patients were in sepsis (65.73%). Forty-two patients or 14.69% were in a state of severe sepsis and 48 patients or 16.78% were in a state of shock. Acute generalized peritonitis (29.37%) was the most pathology observed. No bacteriological results were obtained before the patient's transfer. The combinations of Ceftriaxone/metronidazole (56.34%) were the antibiotics used to treat the intra-abdominal infections. For cutaneous infections and soft parts, the antibiotics used were the association Oxacillin-Metronidazole. The overall mortality rate was 16.75%. The factors associated with the mortality of patients were alcoholism ($p = 0.001$), smoking ($p = 0.02$), the presence of consciousness disorder ($p < 0.005$), hypothermia ($p < 0.005$), shock state ($p < 0.005$), Severe anemia ($p < 0.005$), hyponatremia ($p < 0.005$) and hyperkalemia at admission ($P < 0.005$) and the type of disease (acute peritonitis with p = 0, 0005).

Conclusion: Septic surgical pathologies are common in our service with a high mortality rate. Knowledge of mortality factors will improve the management of our patients.

Keywords: *Septic Pathology; Clinics; Epidemiology; Prognosis; Surgical Emergency Unit; Antananarivo*

Introduction

The septic state, regardless of severity, is defined by the presence of an infection (documented or strongly suspected) and signs characterizing the «inflammatory response» of the organism to it. The classification of septic states adopted since 1992, and still topical, is based on the intensity of the response from organism to infection. It distinguishes the "non-complicated sepsis" from the Serious Septic Syndromes and septic shocks, characterized respectively by the appearance of organ dysfunction and of hypotension that persists despite vascular filling. These three syndromes are considered to be the successive worsening phases of infection and inflammatory response, and the prognosis differs markedly between the 3 stages. In fact, the mortality (at 28 days) is schematically from 10 - 15% to 20 - 30% and 40 - 50% between the sepsis and septic shock stages [1]. Our objectives are to describe the aspects epidemio-clinics, therapeutic and evolutionary of septic diseases at the Surgical Emergency Unit of Joseph Ravoahangy Andrianavalona (JRA) Teaching Hospital and identify the factors associated with the mortality of patients.

Patients and Methods

This was a retrospective and descriptive study carried out in the septic patients admitted to the service of Surgical Emergency Unit of JRA Teaching Hospital, Antananarivo, Madagascar, over a 12-months period from June 2016 to July 2017. Included in the study, all the Septic diseases admitted to our service, requiring intervention surgical in emergency regardless of age and gender. We excluded from the study all patients whose records were incomplete. Data analysis was made with Epi-Info 7 versus 1.1.14 software from the Center for Disease and Prevention (USA). The Chi-2 or Fisher test was used for the comparison of qualitative variables and the Student's t- test for the comparison of averages. Any P-value < 0.05 was considered statistically significant.

Results

Two hundred eighty six (286) patients were selected either 10.75% of surgical emergencies. The average age of our patients was to 41.3776 +/ - 19, 17 yrs, with male predominance (70.63%). Alcoholism (30.77%), smoking (32.17%) and high blood pressure (21.68%) were the most observed medical history. At admission, the majority of patients had hyperthermia (53, 14 %). Table 1 represents the distribution patients according to clinical signs at admission.

Characteristics	Effective (n = 286)	Percentage (%)
Signs		
Consciousness disorder (CGS≤13)	26	9,09
Hyperthermia (T ° > 37.5°C)	152	53,14
Hypothermia (T ° < 36°C)	50	17,48
Severity of the disease		
Sepsis	118	65,73
Severe Sepsis	42	14,69
Septic Shock	48	16,78

Table 1: *Distribution of patients by clinical signs to admission.*

Four patients or 1.40% had severe anemia. Hyponatremia was the main ionic anomaly observed. All patients had a predominantly neutrophil leukocytosis. For the severity of the disease, the majority of patients were in sepsis (65.73%). Forty-two patients or 14.69% were in a state of severe sepsis and 48 Patients or 16.78% were in a state of septic shock requiring vasopressors administration. Acute peritonitis generalized (29.37%) was the main surgical indication observed. The majority of patients were operated under general anesthesia (88.11%).

The most commonly used anesthetic products were the association Propofol-Fentanyl +/- Pancuronium (55.94%). Table 2 shows the distribution of patients according to the type of disease.

Surgical pathologies	Effective (n = 286)	Percentage (%)
Acute generalized peritonitis	84	29,37
Anal abscess	33	11,53
Diabetic foot wounds	31	10,83
Post-burn infection	31	10,83
Breast abscess	22	7,69
Foot Abscess	19	6,64
Fournier's disease	12	4,19
Axillary abscess	10	3,5
Appendicular abscess	10	3,5
Others	34	11,88

Table 2: *Distribution of patients according to the type of the disease.*

No bacteriological results were obtained before the patient's transfer. The combinations of Ceftriaxone/metronidazole (56.34%) were the antibiotics used to treat the intra-abdominal infections. For cutaneous and soft parts infections, the antibiotics used were the association Oxacillin-Metronidazole. Table 3 recalls the distribution of patients according to the probabilistic antibiotics used.

Antibiotics	Number (n = 286)	Percentage (%)
Intra-abdominal Infections		
Ceftriaxone/Metronidazole	160	56,34
Amoxicillin + Clavulanic Acid/metronidazole	52	18,18
Ceftriaxone/metronidazole/gentamycin	34	11,89
Ciprofloxacin/metronidazole	24	8,39
Skin Infections and of Soft parts		
Oxacillin/Metronidazole	16	5,59

Table 3: *Distribution of patients according to the probabilistic antibiotics used.*

The overall mortality rate was 16.75%. Factors associated with patient mortality were alcoholism ($p = 0.001$), smoking ($p = 0.02$), consciousness disorder ($p < 0.005$), hypothermia ($p < 0.005$), and shock state ($p < 0.005$) at the admission, the existence of Severe anemia ($p < 0.005$), hyponatremia ($P < 0.005$), hyperkalemia ($p < 0.005$) and the type of disease (acute peritonitis with $p = 0,0005$). Table 4 represents the mortality factors.

Factors	Survivors (No)	Deceased (No)	Total No	P
Alcoholism	64	28	88	0,001
Smoking	70	22	92	0,02
Consciousness disorder	10	16	26	p < 0,005
Hypothermia	32	18	50	p < 0,005
State of Shock (Not < 90mmHg)	18	30	48	p < 0,005
Anemia Severe (Hb < 7g/dl)	0	4	4	p < 0,005
Hyponatremia (Natrémie < 135 mmol/L)	6	8	14	p < 0,005
Hyperkalemia (Kaliémie > 5 mmol/L)	0	4	4	p < 0,005
Acute Peritonitis	60	24	84	p < 0,005

Table 4: *Mortality factors.*

Discussion

In our study Septic pathologies represented 10.75% of surgical emergencies. Acute generalized peritonitis was the main observed pathologies. Among septic surgical emergencies, intra-abdominal infections are one of the most frequent emergencies and are a primary cause of septic shock [2]. According to African studies, acute generalized peritonitis is seen in 7, 4 to 19% of admissions [3-6]. While in the western countries this rate is around 3% [7]. Concerning antibiotics, the combinations of Ceftriaxone/Metronidazole (56.34%) were the antibiotics used to treat the intra-abdominal infections in our study. Waiting for bacteriological exam should never delay the anti-infectious treatment, initiated urgently as soon as the diagnosis is put. Antibiotics in progress are not likely to negatively affect microbiological samples. The French experts proposed for the probabilistic treatment of Community peritonitis to target Bacillus to Gram-negative aerobic and Anaerobic using an association of Amoxicillin/Clavulanic acid + Gentamicin or Cefotaxime (or Ceftriaxone) + Metronidazole [8]. In case of severe infection, the presence of *Enterococci* must be targeted by the use of Piperacillin-Tazobactam + Gentamicin because *Enterococci* are poor prognosis, especially in aged patients [9].

In our study, in the case of cutaneous and soft parts infections, the antibiotics used were the association Oxacillin/Metronidazole. According to the recent recommendations, in case of diabetic foot, Ceftriaxone or the association Amoxicillin-acid Clavulanic +/- Gentamycin are the first-line antibiotics to use. In case of fasciitis necrotizing, the recommended antibiotics are the Ceftriaxone-Clindamycin association. The alternative is the associated Clindamycin-Gentamycin [10-12].

Our mortality rate was 16.78%. Generalized acute peritonitis was the main cause of death. According to Seguin and Al [13], the mortality rate of generalized acute peritonitis varies from 20 to 30%. According to Marshall [14], 30% of the patients admitted in reanimation for intra-abdominal infection succumb to their disease. This low mortality rate could be explained by the low number of patients in shock in our series.

The factors associated with the mortality of the patients observed in our study were the comorbidities (Alcoholism, smoking), the existence of a disorder of consciousness, hypothermia, a state of shock, severe anemia, a hyponatremia and hyperkalemia at the admission and type of the disease (peritonitis). One study analyzed variables associated with 28-day mortality in septic patients in emergency. It contains tachypnea, hypoxemia, thrombocytopenia, encephalopathy, low respiratory infection, but also the presence of a shock, and variety related to the patients (age greater than 65 years, residence in a retirement home or long stay, rapidly fatal or terminal illness) [15]. For acute peritonitis, the number of organ failures at the time of diagnosis is correlated with mortality. From the biological point of view, hyperleukocytosis, leukopenia, thrombocytopenia and hypoalbuminemia are bad prognosis [16,17].

Conclusion

Septic surgical pathologies are common in our service with a high mortality rate. They are dominated by acute generalized peritonitis. This Study allowed us to clear 9 mortality factors namely alcoholism, smoking, the presence of consciousness disorder, hypothermia and shock at the admission, the existence of severe anemia, hyponatremia, hyperkalemia and acute peritonitis. Knowledge of these mortality factors will improve the management of our patients.

Conflict of Interest

There are no conflicts of interest.

Author's Contribution

All the authors contributed to this study.

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