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Incidence of Nosocomial Infections in Burns in The Surgery Department of The Reference Hospital Jason Sendwe in Dr Congo

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ABSTRACT

Introduction: *Data-t-on nosocomial infections in burns are rare then and yet they constitute therapeutic emergencies. The objective of this work was to determine the incidence, clinical and therapeutic aspects and the associated complications of nosocomial infections in people with burns from Sendwe HGR in the DRC.*

Methods: *We carried out a longitudinal descriptive study during the period from January 1 to December 31, 2019. Our study population consisted of all patients hospitalized in the burns department of the HGR Sendwe during the study period.*

Results: *The incidence of nosocomial infections in burns was 22.6%; the depth of the most important burn was the second superficial degree at 87.09%, the extent of the most important burn was between 0 and 10% i.e. a frequency of 38.76%, the site of the burn the more frequent was made of the association of upper limbs, lower limbs and head at 12.9%; the time to onset of nosocomial infections in burns was between the third day and the fifth day at 35.71%; electrolyte resuscitation fluid in burns was the combination of ringer lactate and physiological saline at 83.87%, the antibiotic most used in burns was the combination of metronidazole and cefotaxime at 67.74 %.*

Conclusion: *The incidence of nosocomial infections in burns was high; essential hygiene measures, sterilization and disinfection measures for the equipment used should be maximized in order to further prevent these scourges.*

Keywords

Incidence, nosocomial infection, burns.

Introduction

Issue: Infection in general and nosocomial infection in particular represents a particularly frequent complication in severe burns, the latter is defined as an infection occurring more than 48 hours after the patient's admission. In addition to their frequency, the infectious complication is also one of the leading causes of death, once the acute phase of severe burns has passed. This high susceptibility to infections is mainly explained by the loss of the skin covering, the first line of immune defense, and the immune disorders induced by the initial aggression [1]. Over the past decades, the survival rate of severely burned patients has improved with the progress of patient care and the better organization of burn centers, however the mortality rate remains relatively high, the burden of heavy care and infection remain the main causes of death [1]. The severity of a burn is determined by 3 very essential parameters: The total extent and the proportion of a deep burn, the site of the lesion (in particular the face and the perineum) and the physiological age of the patient. Initially sterile, the wound is rapidly colonized after 48 hours by gram + bacteria and present on the skin flora such as staphylococcus aureus, after 72 hours, the wound is colonized by gram bacteria such as Pseudomonas aeruginosa, klebsiella pneumoniae and then escherischia coli, we are currently witnessing the emergence of increasingly virulent and antibiotic resistant germs [2]. From the above.

State of the matter

Optimizing the management of burns in a suitable structure improves the prognosis. However, one of the first causes of morbidity and mortality in burns is nosocomial infection. Loss of skin barrier, invasive devices and immunosuppression linked to the burn are 3 mechanisms contributing to the occurrence of these infections [3]. Nosocomial infections from the Greek nosos: disease and Komen take care of) have been around since we grouped together the diseases geographically in an attempt to provide them with assistance. For many centuries, the concepts of nosocomial infection did not require semantic discrimination. The first hospitals were organized as a common ward, which increased the probability for patients to contract a nosocomial infection [4]. Although progress in the management of burns has made it possible in recent years for the survival of seriously ill patients, infection remains the most frequent and most formidable complication in severe burns [5]. However, the poor functioning of the clinical services, the non-respect of hygienic working conditions, the lack of asepsis, the lack of control of the source of infection by the staff, the non-isolation of the contagious can lead to the explosion. epidemic of contagious and non-contagious diseases in the health services [4]. Worldwide, the study carried out by the CDC in Atlanta, USA, indicated an incidence of nosocomial infections in burns reaching 37% for all hospitalized patients from January 2013 to June 2014 [6]. In France, 19% of patients hospitalized at the burns treatment center presented infectious signs during the summer of 2006 [7] In Africa, a study carried out in 2003 at the burns service of Casablanca in Morocco, revealed that 54% of patients were positive in blood cultures carried out [8] In the Democratic Republic of Congo, few studies have been carried out on nosocomial infections, including those carried out on the incidence of nosocomial urinary tract infections and surgical sites of maternity hospitals in Lubumbashi [9]; It should be noted 3 that the study carried out in 2016 at the Cliniques Universitaire de Lubumbashi and HGR Sendwe demonstrates that 5 germs are responsible for a nosocomial infection in infected patients: escheria coli (11.9%), Staphylococcus aureus (6,8%), pseudomonas aeruginosa (5.1%) shigella spp.

Specific objectives: This work aims to:

- Determine the incidence of nosocomial infections in burn victims.
- Determine the clinical and therapeutic aspects in burn victims.
- Determine the frequency of complications associated with nosocomial infections in burn victims.

Methods

Lubumbashi, the Sendwe general hospital is located in the eastern part of the municipality of Lubumbashi. It is bounded to the north by avenue Sendwe to the south by avenue des écoles to the east by the Wema high school to the west by avenue Likasi. This public interest hospital includes two main parts namely: the suburban part and the upstairs part in which we find several hospital services.

The Sendwe hospital with its capacity of 1200 beds is ranked second after the general hospital of Kinshasa it serves, so to speak, the population of all the communes of Lubumbashi, but also that coming from all the rest of Katanga of two Kasaï and from South Kivu.

This is a longitudinal descriptive observational study carried out during the period from January 1, 2019 to December 31, 2019, i.e. a period of 12 months. The study population consisted of patients who were hospitalized in the severe burns department of this said hospital.

The following were included in the study: all patients brought alive and hospitalized in the burns department for at least one hour.

Sampling was convenient in a non-probability mode. All those who fulfilled the inclusion criteria were recruited, 67 patients were hospitalized during our study period, 5 were excluded according to the pre-established non-inclusion criteria. The data collection was carried out by us using a pre-established survey form. Consulting the files and register provided the additional elements essential to validate the data. The data were analyzed using Excel version 2013 software and we used standard statistics to describe our samples and calculate frequency measurements. The information collected during this study was strictly confidential and is only used for research purposes.

Results

Incidence

A total of 67 patients were hospitalized during our investigation; 5 were excluded from our study according to the pre-established non-inclusion criteria; and therefore we remained with 62 patients among whom 14 patients developed a nosocomial infection during their hospitalization and this work was carried out for patients hospitalized from January to December 2019. The incidence of nosocomial infections was then 22.6%. Nosocomial infection occurred in 35.71% between the third day and the fifth day, followed by 28.57% between the eleventh day and the twentieth day.

The results are presented in a comparative manner between the cases of burns infected with a nosocomial infection and those not infected.

Sociodemographic characteristics

The male sex was equally represented among the uninfected at 50% while in the category of infected the female sex was more representative at 57.14%. The age group most affected among the infected was that between 0 and 10 years or a frequency of 42.85% unlike the uninfected in whom the interval between 31 and 45 years represented 37.5%.

Compared to the municipality of residence of the burns, the most represented municipality was Ruashi at 22.58% among the uninfected and Kenya at 29.16% among the infected.

Table 1: Profile of burns.

Profile of burns	Infected burns		Uninfected burns		Total	
Season of onset	*n (14)*	*%*	*n (48)*	*%*	*n (62)*	*%*
Dried	6	42.58	24	50.00	30	48.4
Rain	8	57.14	24	50.00	32	51.6
Place of occurrence						
Community	10	71.42	30	62.5	40	64.51
Professional	2	14.29	12	25.00	14	22.58
Vulnerable agents						
Heat	6	42.85	28	58.33	34	54.84
electricity	6	42.85	8	16.66	14	22.58
Acid	2	14.29	12	25.00	14	22.58
Burn depth						
First degree	2	14.29	0	0	2	3.2
Second degree	10	71.42	44	91.67	54	87.09
Third degree	2	14.29	4	8.33	6	9.67
Complications						
Anemia	10	71.42	16	33.33	26	41.93
Dehydration	2	14.28	10	20.83	12	19.35
Respiratory distress	0	0	8	16.66	8	12.9

Compared to the season of occurrence of the burn, the cases of burns were much more recorded during the dry season, among which 57.14% of the infected cases occurred during the rainy season while in the uninfected the two seasons occurred. shared equal proportions, i.e. 50%.

As for the most causative agents in the infected burns were: thermal heat and electricity at 42.85%, while in those uninfected, thermal heat was involved in 58.33% of cases.

Clinical and paraclinical aspects

Second-degree burns constituted the most representative group (71.42), the extent of the burnt area was mainly between 0-10% followed by 50 to 60%.

Depending on the site of the burn, the upper limbs, the head; the lower limbs as well as the isolated upper limbs were the most affected sites at 12.9%.

Globally the most prominent complication was anemia, it represented 33.33% in uninfected burns and 71.42% in infected burns; respiratory distress was exclusively observed in uninfected at 16.66%.

Table 2: Management of burns.

Supported	Infected burns		Uninfected burns		Total	
Infusion fluid	*n (14)*	*%*	*n (48)*	*%*	*n (62)*	*%*
Ringer lactate and physiological serum	10	71.42	42	87.50	52	83.87
Ringer lactate + 5% glucose	0	0	6	12.50	6	9.67
Antibiotic therapy						
Metronidazole + Cefotaxine	12	85.71	30	62.50	42	67.74
Amoxicillin	2	14.28	10	20.83	12	19.35
Pain relievers						
Paracetamol	4	28.57	12	25.00	16	25.80
Tramadol	4	28.57	18	37.50	22	35.48
Type of dressing						
Flammazine	8	57.14	41	85.41	49	79.3
Wet in the dakin	4	28.57	3	6.25	7	11.28

General treatment of burns

Compared to infusion fluids, lactate ringer associated with physiological saline at 83.87%. The combination of antibiotics most used in burns was that made of Metronidazole associated with cefotaxime at 67.74% or in 85.71% in infected burns as well as 62.5% in uninfected, other antibiotics were used globally at 6.45%. Compared to taking analgesics in burn victims, tramadol was the most used at 35.48% and the least used was morphine at 3.22%.

The type of dressing

The type of dressing most used was that of flammazine, i.e. in 85.41% in uninfected cases and 57.14% in infected cases, followed by tulles gras (14.28%) and Wet with dakin (28.57%).

The examinations carried out

Several prescribed examinations were not carried out, only the search for the c reactive protein in infected patients was carried out.

The length of hospitalization

The duration of hospitalization between 0 and 15 days was more frequent (42.85%) in uninfected cases against 79.16% in infected cases and 31 to 45 days.

The evolution of the treatment

Compared to the course, 71.41% of infected burns have progressed to death while 70.83% of uninfected cases have progressed to recovery.

Discussion

The study of the incidence of nosocomial infections in burn victims is a longitudinal study. It is based on the continuous monitoring over time of a set of patients with recording of new cases of infection occurring during hospitalization. The situation of each patient with regard to infection is evaluated for the whole as soon as he is hospitalized and at the end of the study the incidence is calculated. Our study, which aimed to determine the incidence of nosocomial infections in burn victims, determine the clinical and therapeutic aspects in burn victims, then assess the frequency of complications associated with nosocomial infections in burn victims in the surgical department of the General Hospital by Reference Jason Sendwe found an incidence of 22.6%, the clinical aspect was based on the depth, the extent and the site of the burn but also the moment of onset of the nosocomial infection; the therapeutic aspect was based on hydroelectrolytic resuscitation, antibiotic therapy, analgesia as well as the type of dressing used in patients with nosocomial infection. As noted complication, there was anemia, sepsis, dehydration and respiratory distress.

In view of these results, we reaffirm that our study method enabled us to achieve the objectives that we set ourselves for this study. Knowing that the collection techniques and tools used to collect the data were in line with the collection and analysis techniques, we certify that the results of our study are valid and can serve as indicators in the management of burned.

The incidence of nosocomial infections in burn victims in our study was lower than that of Amine Rafik in the USA in 2015 at 37% [11] and Ezoubi. M et Coll in Casablanca, Morocco 54% [8]. Nevertheless, close to Arnand P in France in 2006 19% [7]. These differences could be explained by the short duration of our study, which did not allow us to have a suitable number of people to make a comparison with the other studies. Regarding the clinical aspect, the depth of the superficial second degree was greatest in the burn patients. Departing from Fortin in France in 2009 at 41.8% [12], close to Boraca in 2009 at 64% [13]. Surface burns by the scrambling liquid depend essentially on the low viscosity of the liquid unlike deep ones which depend on the high viscosity of the product.

The most common site of the burn was the combination of the upper limbs, head and lower limb which predominated in our study. However, Boukind reported in his study a predominance of upper limb burns 71.6% [14], approaching Daglia M. in the USA who found a predominance of upper and lower limbs 53.6% [15]. This is explained by the fact that when a person is exposed to the wounding agent of the burn, the limbs constitute the first means of defense.

Regarding the distribution according to the area burned, the interval between 0 and 10% was the most important in our study, it deviates from Mbuyi in DRC for the interval between 10 and 30% with a frequency of 78.2% [16]. On the other hand, it is similar to Kouassi Y and collaborators who report for the burnt area an extent of less than 15% reaching 95.3% [17]. This is explained by the fact that the time of exposure to the burn was very short. Regarding the time to onset of nosocomial infection, it occurred mainly between the third and fifth day. The existence of a period of 5 days had already been mentioned by GIL M and collaborators in 2000 [18]. Indeed, a nosocomial infection occurs at least 48 hours after admission or beyond if the incubation period is known. Regarding the therapeutic aspect in the burns of the HGR Sendwe, fluid electrolytic resuscitation was the association made of ringer lactate and physiological serum. On the qualitative level, the debate Crystalloid colloids remains relevant, colloids are frequently introduced, especially albumin after the eighth hour [19]. The most widely used antibiotic therapy was the combination of metronidazole and cefotaxime. In other respects, antibiotic therapy is based not only on infectious clinical signs but above all on the result of the cytobacteriological examination. The most commonly used analgesic in burns was tramadol; The SFETB [20] declares that analgesics at level 1 and 2 of the WHO classification are ineffective, thus opioids should be prescribed according to titration, efficacy evaluation and monitoring for side effects. The most widely used dressing was flammazine occlusive ; Carsin H. [21] reports that the silver sulfadiazine-based dressing provides good infection prevention.

The most prominent complication was anemia, it differs from Ezzoubi M and collaborators in Rabat 64% [8] and Dajardin B 63.63% [22] who observed a predominance of sepsis. This is because an infection can cause a number of changes in the red blood cells, including a shortening of their lifespan, a slowing down in the production of new red blood cells in the bone marrow and iron retention which therefore cannot. be used to make new red blood cells. The scarcity of paramedical examinations to identify other complications before the patient's death. Regarding the age group, sex and the evolution of burn patients in our study, we found the predominance of that of 31 to 45 years.

Conclusion

During our study on the incidence of nosocomial infections of burns in the surgical department of the HGR Sendwe, we observed the following: The incidence of nosocomial infections of burns was high. The most important complication in infected patients was anemia; the depth of the burn in the burns was the second superficial degree, the extent of the most important burn was between 0 and 10%, the site of the most affected burn was made of the association of upper limbs, head and legs. The electrolytic resuscitation fluid was ringer lactate associated with physiological serum, the antibiotic therapy most used in burns was the combination made of cefotaxime and metronidazole, the analgesic most used in burns was tramadol, the most important type of dressing was occlusive with flammazine. Given the various morbid complications of infection in burns, all means should be directed towards preventive measures with a well-equipped burn service with an isolation circuit for infected patients and well-trained and informed nursing staff.

We recommend that the population avoid handling burn lesions and abandon these old habits of applying indigenous substances, often septic, to the lesions, which substances precipitate infection thus complicating healing as quickly as possible.

It is up to the political, administrative and health authorities to equip health structures with the supply of essential drugs and adequate materials; - Improve the living conditions of the population by supplying stable electricity and put an end to this load shedding policy.

Nursing staff to strengthen the measure of asepsis and antisepsis in the management of the burn regardless of the extent and depth.

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