Original Research Article

Bacterial dermo-hypodermatitis (BDH) in Ziguinchor (Senegal): a 2-year review

ABSTRACT

Introduction

The incidence of bacterial dermo-hypodermatitis (BDH) varies worldwide. In Africa, a resurgence has been noted in recent years, with the identification of certain local and general risk factors in urban areas. However, the epidemiology of bacterial dermohypodermatitis in other regions of Senegal remains unknown. The aims of our study were to determine the epidemiological, clinical, and therapeutic outcome of bacterial dermo-hypodermatitis, as well as to identify the eventual associated risk factors.

Methodology

We conducted a descriptive cross-sectional study of the records of patients followed for BDH in the two Dermatology departments of the Ziguinchor region over a 4-year (01 July 2019 to 01 July 2022).

Results

We collected 148 cases of BDH. The sex ratio was 1.17. The mean age of patients was 55.83 years. Non-steroidal anti-inflammatory drugs were used in 13 cases (8.8%), with worsening of symptoms in 9.5%. Bacterial dermohypodermatitis was non-necrotizing in 133 cases (89.9%) and necrotizing in 15 (10.1%). There was a point of entry in 92 cases (62.1%). Amoxicillin-clavulanic acid has been used in 124 cases (83.8%). Surgical debridement has been performed in 12 cases (8.1%). Favorable progression noted in 141 cases (98.6%). General factors associated with BDH were arterial hypertension in 21 cases (14.2%), obesity in 20 cases (13.5%), diabetes in 14 cases (9.5%) and artificial depigmentation in 8 cases (5.4%). Skin Regional risk factors were lymphedema in 14 cases (9.5%), and no deaths were observed.

Conclusion

Bacterial dermo-hypodermatitis is common in Ziguinchor, and predominantly affects adult males, contrary to the predominance of females in the literature. Cardiovascular risk factors such as obesity and arterial hypertension were the most common.

Key words: Epidemiology, bacterial dermohypodermatitis, Ziguinchor

INTRODUCTION

Bacterial dermohypodermatitis (BDH) is the term used to describe all primary acute or, more rarely, subacute infections affecting dermohypodermal tissue, the bacterial etiology of which has dominated by group A beta-hemolytic streptococci [1,2]. Several Western and African publications [1, 3, 4] have noted a marked upsurge in these dermo-hypodermal infections [1, 6, 7], attributed to the existence of local and general risk factors [5]. Identifying these risk factors is essential, as their management can improve the prognosis of patients with BDH. These risk factors have been well identified in Dakar and other French-speaking African countries [6]. However, no study has been carried out in Ziguinchor, despite the fact that this region does not share the same environmental and socio-cultural conditions as the Dakar region. The aims of this study were to determine the clinical, therapeutic and evolutionary epidemiological profile of bacterial dermohypodermatitis, and to identify risk factors for bacterial dermohypodermatitis.

METHODOLOGY

We conducted a cross-sectional, descriptive study over a 4-year period from July 01, 2019 to July 01, 2022 in the dermatology departments of the Peace hospital and the regional hospital of the Ziguinchor region (located 700km from Dakar). The department of Ziguinchor covers an area of 1153 km². It is bordered to the north by the department of Bignonia, to the east by the department of Sedhiou, to the west by the department of Oussouye and to the south by the Republic of Guinea-Bissau (figure 1). The climate is continental, sometimes influenced by the sea. The various winds that blow are the monsoon to the south-north and the maritime trade winds to the north-east and south-west. The population of Ziguinchor is estimated at around 621,171. Its ethnic make-up includes diolas, mandingues, peulhs, wolofs, manjacques, bainoucks, mancagnes and balantes. Administratively, the department of Ziguinchor is divided into 2 arrondissements (Niaguis and Nyassia). In terms of decentralized administration, Ziguinchor is divided into six municipalities (Niaguis, Adeane, Boutoupa, Camaracounda, Nyassia and Enampore). The regional hospitals border Gambia, Guinea Conakry, Guinea Bissau and Mali. They are home to the two leading dermatology departments in Casamance.

We included all patients followed for bacterial dermohypodermatitis. The diagnosis of DHB was essentially clinical. Non-necrotizing DHB was characterizing by an acute inflammatory swelling

with an erythematous plaque of centrifugal extension, with or without bullae, and with or without an infectious syndrome. The diagnosis of necrotizing DHB was based on the existence of an inflammatory swelling with anesthetic plaque and escarotic necrosis, with or without an infectious syndrome.

Data collection was based on a pre-established questionnaire collecting socio-demographic, clinical, paraclinical, therapeutic and evolutionary information. Data entry and analysis have been performed using Sphinx Demo and SPSS 13.0 software. Descriptive studies have been carried out by calculating frequencies, proportions and confidence intervals for qualitative variables. And for quantitative data, by calculating averages with their standard deviation. Analytical study using cross-tabulations. To compare frequencies, we used the Chi-square test[2] or the Fisher test. The significance level was $p < 0.05$.

RESULTS

We recorded 148 cases of bacterial dermohypodermatitis over a 4-year period, representing a hospital frequency of 1.8% at the Peace hospital and 1.3% at the regional hospital of Ziguinchor. The patients were male in 80 cases (54.1%) and female in 68 cases (45.9%), i.e. a sex ratio of 1.17. The mean age was 55.83 years, with extremes ranging from 11 to 89 years. Figure 2 shows the distribution of patients by age group. 86.5% of patients lived in Ziguinchor, six in Sedhiou, one in Kolda, six in Guinea-Bissau and one in Gambia. Initial patient management is shown in Table 1. There was a history of erysipelas in 14 cases, and a history of stroke in 5 cases; artificial depigmentation with strong topical steroids has been noted in 8 cases (5.4%). General signs were fever in 26 cases (17%), arterial hypertension in 17 cases (11.5%) and obesity in 6 cases (4.1%). Bacterial dermohypodermatitis was non-necrotizing (figure 3**)** in 133 cases (89.9%) and necrotizing (figure 4) in 15 cases (10.1%), topographically affecting the lower limbs in 142 cases (95.9%), the upper limbs in 5 cases (3.4%) and the face in one case. Bullous detachment was associated with BDH in 16.8% and satellite adenopathy in 7.4%. There was a point of entry in 92 cases (62.1%). Table 2 illustrates the different entry sites for BDH. Lymphedema has been noted in 14 cases (9.5%). General factors included arterial hypertension in 21 cases (14.2%), obesity in 20 cases (13.5%), diabetes in 14 cases (9.5%), artificial depigmentation in 8 cases (5.4%) and HIV 1 infection in 1 case (0.67%). Biological examination revealed a biological inflammatory syndrome in 94% of cases, inflammatory anemia in 33%, and normal bacteriological examination of local samples and blood cultures.

The electrocardiogram revealed ventricular overload in 4 cases, a rhythm disorder in 10 cases and subepicardial ischemia in 2 cases. Cardiac ultrasound revealed ischemic cardiomyopathy in one case and pulmonary hypertension in 2 cases.

Venous Doppler ultrasonography revealed deep vein thrombosis in 3 cases. All patients had received antibiotic therapy.The different antibiotics used have been shown in Table 3. Analgesics have been used in 99 cases (78.37%). Anticoagulants have been used in 64 cases (43.2%). Insulin has been used in all cases of diabetes, and antihypertensives in hypertensive patients. Surgical debridement has been performed in 12 cases (8.1%). Patients received compression stockings in 12 cases (8.1%). The evolution of BDH was favorable in 141 cases (98.6%). The average healing time was 20 days, with extremes of 10 to 30 days for erysipelas,

and 25 days for necrotizing forms, with extremes of 1 to 4 months. Complications included severe sepsis in one case, abscesses in 5, lymphedema in 3 and death in 2. Mortality was due to severe sepsis and cardiac arrest.

DISCUSSION

We report 148 cases of bacterial dermohypodermatitis in Ziguinchor's two dermatological referral centers. Our epidemiological profile differed from that reported in urban Dakar (Table 4). There was a predominance of males, with an average age of 56, associated with cardiovascular risk factors [1,7,8]. We have noticed a delay of patients to consult the doctor, with an average delay of 10 days. This delay has been attributed to financial difficulties on the part of patients, or to the use of traditional herbal medicine [1,2,9,10]. Leg erysipelas was the most frequent clinical form in 133 cases (89.9%), in line with all studies reported in the literature [1, 2]. The topography of bacterial dermohypodermatitis is linked to the existence of local and general risk factors. A point of entry has been noted in 62.16% of cases, with a predominance of intertoe intertrigos and neglected traumatic lesions. Wearing closed shoes and having a diabetic foot were the main risk factors. Lymphedema, noted in 9.5% of cases, is a major risk factor for bacterial dermohypodermatitis. It favours lymphatic accumulation, which is a favorable environment for microbial proliferation [2]. Cardiovascular risk factors such as arterial hypertension, obesity and diabetes were the main general factors associated with bacterial dermohypodermatitis. They were also identified in several studies in Dakar and sub-Saharan Africa [6]. Voluntary cosmetic depigmentation with topical steroids was noted in 5% of our study. Its prevalence is lower than in previous studies carried out in Senegal. It is an empirical phenomenon with a high prevalence in Africa. It is a particular risk factor for bacterial dermohypodermatitis in Africa, occurring in 20.1% of cases, with an OR = 4.29 (95% CI [2.35-7.83]) [6,12]. Strong class topical steroids are used in this cosmetic practice, resulting in local immunosuppression and systemic passage of corticoids, which in turn promotes metabolic syndrome [11]. A biological inflammatory syndrome has been noted in 94% of cases, and bacteriological yield was low. In 2.7% of cases, erysipelas was the reason for the discovery of diabetes, underscoring the importance of glycemic control in the management of bacterial dermohypodermatitis. The association of BDH with venous thrombosis has been estimated at 10%, and has been noted in 3 cases [4]. Amoxicillin-clavulanic acid was the first-line treatment for BDH in 124 cases. The extensive use of amoxicillin-clavulanic acid in our series was linked to its accessibility and efficacy. All patients with necrotizing dermo-hypodermatitis underwent

surgical excision of necrotic tissue, followed by skin grafting. Post-operative management was straightforward.

The outcome was favorable in 98.6%, similar to previous studies [9]. Complications occurred in 6.7%, and mortality was associated with severe sepsis and cardiac arrest [6].

CONCLUSION

Bacterial dermohypodermatitis is a frequent skin infection in Ziguinchor. They occur in adults over 55 with cardiovascular risk factors such as hypertension, obesity, diabetes and artificial depigmentation in women. Identification of these associated factors enables early management and prevention of recurrences.

Ethical Approval

All the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national).

Consent

Informed consent for participation in this study was obtained from all patients.

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Figure 1: Map of the Ziguinchor region (Senegal)

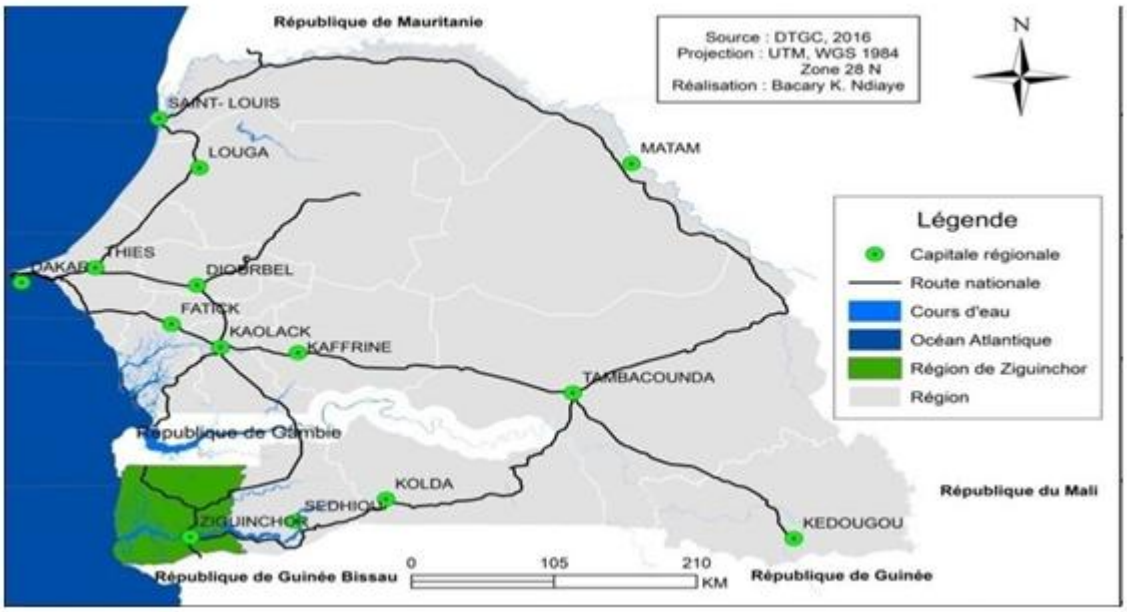

Figure 2: Distribution of patients according to age group

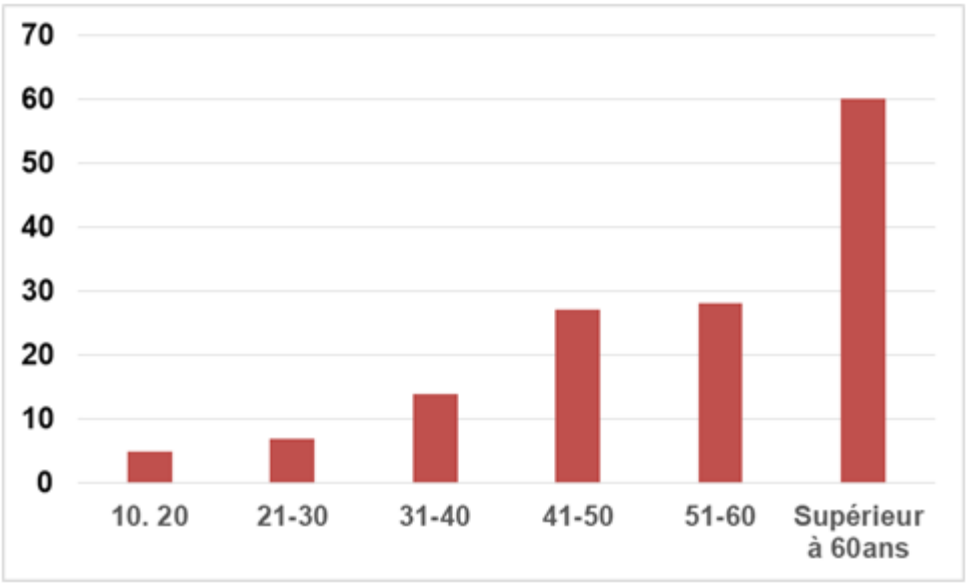

Figure 3: non-necrotizing dermohypodermatitis of the leg

Figure 4: necrotizing dermohypodermatitis of the leg

Table 1: Therapeutic route of patients

initial support	**Number**	**Percentage %**
traditional healer	12	8,1
Nurse	11	7,4
Dermatologist	11	7,4
general practitioner	7	4,7
private general practitioner	3	2,0
Pharmacist	1	0,7

Table 2: Gateway to bacterial dermohypodermitis

Point of entry	**Number**	**Percentage %**
intertrigo-intertoe	37	25,0
Post traumatic wound	36	24,3
Excoriated dermatose	16	10,8
Ulcer	3	2,0

Table 3: Antibiotics used in bacterial dermohypodermitis

Antibiotics	**Number**	**Percentage %**
Amoxicillin-clavulanic acid	124	83,8
Metronidazole	59	39,9
Gentamicin	21	14,2
Pénicillin G	14	9,5
Benzenthin pénicillin	6	4,04
Ceftriaxon	5	3,4
Amoxicillin	4	2,6
Imipeneme	2	1,3
Erythromycin	2	1,3
Fluoroquinolone	1	0,67

Table 4: Epidemiological profile of BDH from Ziguinchor

Epidemiological profile of BDH from Ziguinchor	
Hospital frequency	1,8%
Mean age	55.83 years [11 to 89 years]
Sex ratio	1.17 [80 men – 68 women]
Clinical forms	number (%)
Bacterial dermohypodermatitis non-necrotizing	133 (89.9)
Necrotizing Bacterial dermohypodermatitis	15 (10.1)
Topography	
Lower limbs	142 (95.9)
Upper limbs	5 (3.4)
Face	1 (0,7)
Local risk factors	
Point of entry	92(62.1)
Lymphedema	14 (9.5)
General risk factors	
Arterial hypertension	21(14.2)
Obesity	20(13.5)
Diabetes	14(9.5)
Artificial depigmentation	8 (5.4)
Favorable outcome	141(98.6)
Death	2(1,3)