



Diabetic Foot: Therapeutic and Evolutionary Aspects at the Internal Medicine Unit of the Fousseyni Daou Hospital in Kayes

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DOI: 10.36347/gamj.2023.v04i01.006

| Received: 14.02.2023 | Accepted: 20.03.2023 | Published: 27.03.2023

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Abstract

Original Research Article

Introduction: The diabetic foot is a frequent and serious complication of diabetes. The aim of this study is to determine the therapeutic and evolutionary of the diabetic foot at the Internal Medicine Unit of the Fousseyni Daou Hospital in Kayes. **Methods:** Descriptive retrospective study carried out from January 1, 2019 to December 31, 2019 (12 months) at the Internal Medicine Unit of the Fousseyni Daou Hospital in Kayes. Were included in the study, all patients hospitalized during the study period for diabetic foot. **Results:** the prevalence of diabetic foot was 46.26%. The age group of 50 -59 was the most represented with 41.94%. The average age was 49 years with extremes of 30 years and 79 years. The female sex predominated with a sex ratio of 0.63. Type 2 diabetes was found in 96.77% of patients. The most common types of foot lesions were: necrosis 22.58%; abscess 19.35%; ulceration 16.13%. The wound was classified according to the classification of the University of Texas: Stage B Grade 2: 45.16% followed by Stage B Grade 3: 22.58% and Stage D Grade 3: 16.13%. All our patients had received 100% insulin therapy on admission. The combination Amoxicillin + Clavulanic acid + Metronidazole was the most used probabilistic antibiotic therapy 29.03%. The surgical treatment was: conservative: flattening 38.71%; necrosectomy 41.94%; toe disarticulation 12.90% and amputation 6.45%. The amputation site was 100% leg. The outcome of the hospitalization was marked by a favorable evolution 80.64%; the referral to Bamako for superinfection 16.13% and death 3.23%. **Conclusion:** Foot lesions are common in diabetic patients at Kayes Hospital. The fight against the diabetic foot requires a preventive approach based on the examination of the feet for the early detection of wounds or pre-injury abnormalities, and to identify patients at high risk of wounds. The challenge is to limit the delay in setting up the treatment and the aggravation of the wounds.

Keywords: Diabetic foot, therapy, evolution, Kayes Hospital.

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INTRODUCTION

The diabetic foot includes any infection, ulceration or destruction of the deep tissues of the foot associated with neuropathy and/or obliterating arteriopathy of the lower limbs in diabetics [1]. It is a frequent and serious complication of diabetes with a

high lower limb amputation rate and considerable socio-economic and psychological consequences [2]. In Africa, foot lesions in diabetics are common and cause 15% to 25% of hospitalizations in diabetics [2, 3]. The risk is favored by the conjunction of neurological, arterial and infectious complications [4]. Poverty, lack of hygiene and walking barefoot interact and aggravate

Citation: Sangaré Drissa *et al.* Diabetic Foot: Therapeutic and Evolutionary Aspects at the Internal Medicine Unit of the Fousseyni Daou Hospital in Kayes. Gha alt Med Jnl, 2023 Jan-Mar 4(1): 37-42.

the diabetic foot [4]. At Kayes hospital, we do not have data on the diabetic foot. The objective of this study is to describe the epidemiological, clinical profile of the diabetic foot in our hospital.

METHODS

Our study took place at the Internal Medicine Unit of the Fousseyni Daou Hospital in Kayes, which is the regional reference structure. This was a descriptive retrospective study of the records of patients hospitalized for diabetic foot from January 1, 2019 to December 31, 2019, i.e. a duration of 12 months. All type 1 or type 2 diabetic patients hospitalized for diabetic foot were included. Diabetic patients without diabetic foot and non-diabetic patients were not included.

We retained the diagnosis of diabetic foot in front of any infection, ulceration or destruction of deep tissues of the foot associated with neuropathy and/or obliterating arteriopathy of the lower limbs in diabetics.

The data was collected on a pre-established individual survey form which was used to collect:

- Epidemiological data on the identity of the patient: surname and first names, age, sex, ethnicity, address, economic status, profession and level of education.

Clinical Data:

- ❖ Related to diabetes: date of discovery, family notion of diabetes, type of diabetes, treatment followed, number of years under treatment.
- ❖ Related to the foot: the practice of foot care at home, method of discovering the wound,

duration of the wound before arrival at the health center, the first gesture made in front of the wound.

The physical examination allowed us to:

- ❖ To measure parameters: weight, height, blood pressure, temperature, respiratory rate, heart rate, BMI.

To look for arteriopathy of the lower limbs:

- ❖ On inspection: ischemic necrosis of the ends of the toes in the form of blackening of the toes.
- ❖ On palpation: the perception or not of the peripheral arterial pulses of the lower limbs (femoral, popliteal, pedal, posterior tibial pulse), cold extremities.

To look for neuropathy:

- ❖ On inspection: deformity, callus, gangrene and Charcot's foot.
- ❖ On palpation: local heat, pain, poorly pitting edema, stringy or poorly perceived pedal pulses.
- ❖ Data from the paraclinical examination: blood sugar, complete blood count (NFS), C-Reactive Protein (CRP), glycated hemoglobin (HbA1C), standard X-ray of the foot, arterial Doppler ultrasound of the limbs lower, swab pus from the wound.

We used the University of Texas classification to classify the diabetic foot in order to assess the severity of the lesions and the prognosis (risk of amputation).

Table I: Classification of foot lesions into grades and stages of severity according to the University of Texas. The values correspond to the prevalence of amputations per hundred lesions in each category

Wound stage	Grade de la plaie			
	Grade 0 Epithelial lesion	Grade 1 Superficial wound	Grade 2 Tendon or capsule damage	Grade 3 Bone or joint damage
Stage A -No infection -No ischemia	0%	0%	0%	0%
Stage B -Infection -No ischemia	12,5%	8,5%	28,6%	92%
Stage C -No infection -Ischemia	25%	20%	25%	100%
Stage D -Infection -Ischemia	50%	50%	100%	100%

These data were analyzed and processed with Epi Info 7.2.2.1 software.

The information collected was completely confidential.

RESULTS

The study involved 31 patients with diabetic foot out of 67 hospitalized diabetic patients representing 46.26%. The age group of 50 -59 was the most represented with 13 cases (41.94%) (See figure 1). The

average age was 49 years with extremes of 30 years and 71 years. There was a female predominance with 19 cases (61.29%) with a sex ratio of 0.63 (See figure 2).

The majority of patients had type 2 diabetes with 30 cases (96.77%) against 1 case of type 1 diabetes (3.23%) (See figure 3).

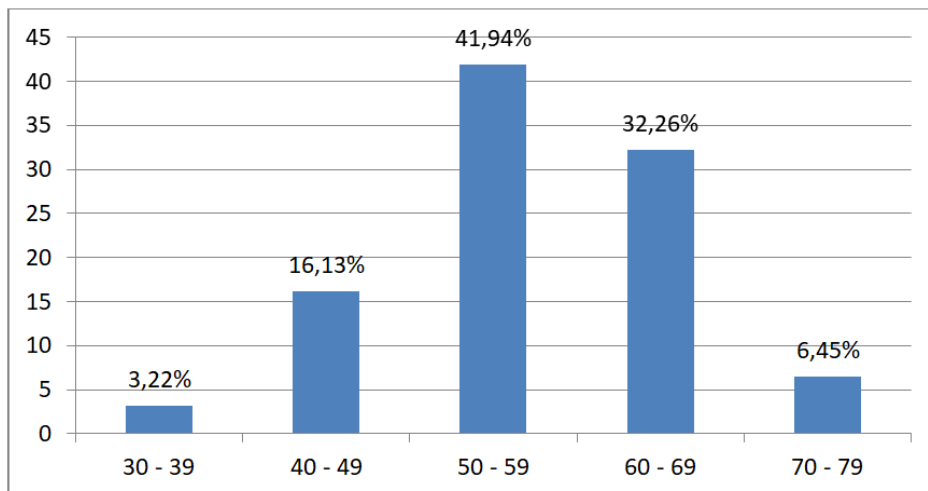


Figure 1: Distribution of patients by age

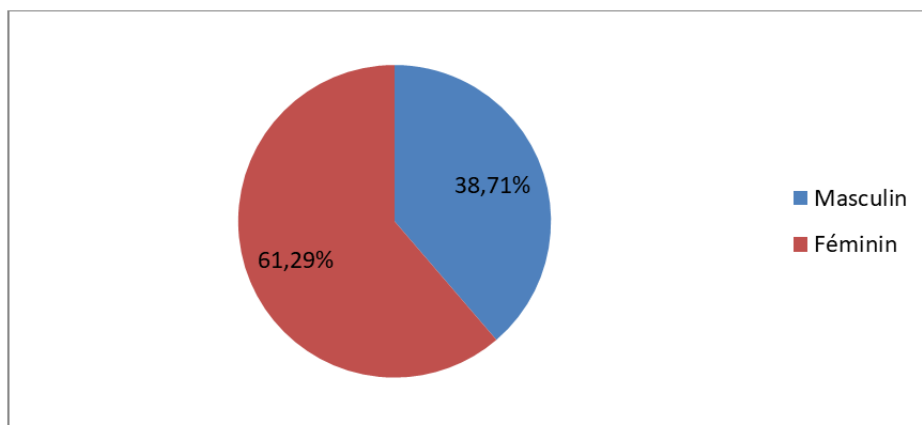


Figure 2: Distribution of patients by gender

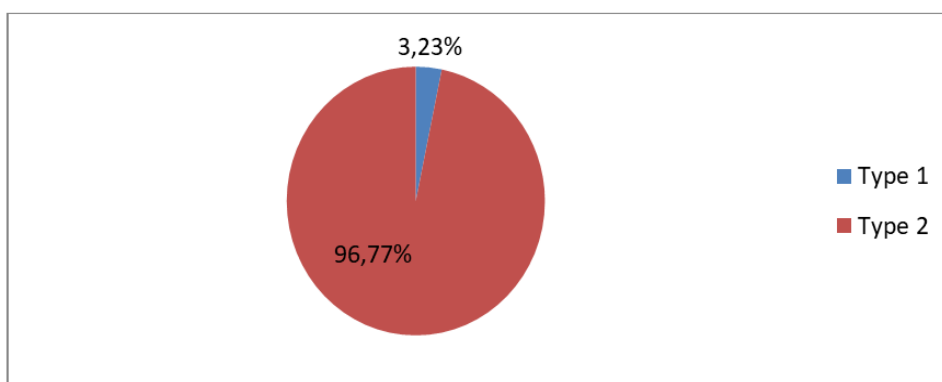


Figure 3: Distribution of patients by type of diabetes

The most common types of foot lesions were: necrosis 7 cases (22.58%); abscess 6 cases (19.35%); ulceration 5 cases (16.13%) (See table 2). The wound was classified according to the classification of the University of Texas: Stage B Grade 2: 14 cases (45.16%) followed by Stage B Grade 3: 7 cases (22.58%) and Stage D Grade 3: 5 cases (16.13%) (See

table 3). All our patients had received insulin therapy on admission in 31 cases (100%) (See table 4). The combination Amoxicillin + Clavlanic acid + Metronidazole was the most used probabilistic antibiotic therapy in 9 cases (29.03%) (See table 5). Surgical treatment was: conservative: flattening in 12 cases (38.71%); necrosectomy 13 cases (41.94%); toe

disarticulation 4 cases (12.90%) and amputation 2 cases (6.45%) (See table 6). The amputation site was the leg in 2 cases (100%) (See Table 7). The outcome of the hospitalization was marked by a favorable evolution in

25 cases (80.64%); referral to Bamako for superinfection 5 cases (16.13%) and death 1 case (3.23%) (See Table 8).

Table 2: Distribution of patients according to type of lesion

Type of lesions	Number	Percentage
Plantar perforating pain	3	9,68
Ulceration	5	16,13
Wet gangrene	4	12,90
Dry gangrene	3	9,68
Cellulite	3	9,68
Abscess	6	19,35
Necrosis	7	22,58
Total	31	100

Table 3: Distribution of patients according to the University of Texas Classification

Stage and Grade of the wound	Number	Percentage
Stage B/ Grade 1	2	6,45
Stage B/ Grade 2	14	45,16
Stage B/ Grade 3	7	22,58
Stage D/ Grade 2	3	9,68
Stage D/ Grade 3	5	16,13
Total	31	100

Table 4: Distribution of patients according to the antidiabetic treatment followed on admission

Antidiabetic treatment followed on admission	Number	Percentage
Oral antidiabetics (ADO) + Hygiéno-dietetic diet (RHD)	0	0
Insulin + RHD	31	100
ADO + Insulin + RHD	0	0
RHD only	0	0
Total	31	100

Table 5: Distribution of patients according to medical treatment

Medical treatment	Number	Percentage
Amoxicillin + Clavlanic Acid	6	19,35
Ciprofloxacin	4	12,90
Amoxicillin+ Clavlanic acid+ Ciprofloxacin	5	16,13
Fucidic acid	1	3,23
Amoxicillin+ Clavlanic Acid+ Metronidazole	9	29,03
Amoxicillin+ Clavlanic Acid+ Ciprofloxacin+ Metronidazole	6	19,35
Total	31	100

Table 6: Distribution of patients according to the type of intervention

Type of intervention	Number	Percentage
Flattening	12	38,71
Necrosectomy	13	41,94
Disarticulation of the toes	4	12,90
Amputation	2	6,45
Total	31	100

Table 7: Distribution of patients according to amputation site

Amputation site	Number (n=2)	Percentage
Foot	0	0
Leg	2	100
Thigh	0	0
Total	2	100

Table 8: Distribution of patients according to progression

Evolution	Number	Percentage
Healing	25	80,64
Referred to Bamako (superinfection)	5	16,13
Death	1	3,23
Total	31	100

DISCUSSION

In our study, the frequency of diabetic foot 46.26%. Doumbia N. *et al.*, [5] in Bamako; Djibril A M. *et al.*, [6] in Togo and Sani R. *et al.*, [7] in Niger had respectively reported a frequency of 11.35%; 12.90% and 13.90%. In our series the age group of 50 -59 was the most represented with 41.94%. For Doumbia N. *et al.*, [5] the 40-60 age group was the most represented in 61.3% of cases. The average age in our study was 49 years. Doumbia N. *et al.*, [5]. ; Djibril A M. *et al.*, [6]; Sani R. *et al.*, [7] found 42.66 years respectively; 60.70 years old and 53 years old. Carpentier B. *et al.*, [8] reported in the European literature that the average age varied between 67 and 73 years. The male sex was predominant in our series with 61.29% with a sex ratio of 0.63. For Doumbia N. *et al.*, [5] women were in the majority with a sex ratio of 0.61.; Sani R. *et al.*, [7] and Amoussou-G.D. [9] had found male predominance with a sex ratio of 2.46 and 2.5 respectively. Jim, FC *et al.*, [10] found a sex ratio of 0.47

In our study, type 2 diabetics accounted for 96.77% versus 3.27% for type 1. Doumbia N. *et al.*, [5] had found 94.7% type 2 diabetes. N'Djim, FC *et al.*, [10] had found 91.5% versus 8.5% of type 1. In our study, the most found types of foot lesions were dominated by necrosis 22.58%; abscess 19.35%; ulceration 16.13%. For Djibril A M. *et al.*, [6] foot lesions were dominated by gangrene 61.29% and ischemic necrosis 12.90%. In the series by Quassimi *et al.*, [11] 32.65% of patients presented with phlegmon, 28.57% with plantar perforating pain, 14.28% with ischemic necrosis; gangrene was found in only 8.16% of cases.

In our series, the severity of foot lesions marked by a high frequency of Stage B Grade 2 lesions: 45.16% of cases with a 28.6% risk of amputation according to the University of Texas classification. Doumbia N. *et al.*, [5] found 29.7%. Stage D Grade 3 with 100% risk of amputation was the most present with 29.7%. Djibril A M. *et al.*, [6] using the Wagner classification reported 61.29% grade 4 and 5. N'Djim F.C. *et al.*, [10] found 10.6%. Stage D Grade 3. Gueye, D.D. *et al.*, [12] found that: grade 1B lesions accounted for 34.0%, followed by 26.4% by grade 2D lesions and 24.5% by grade 3D lesions.

In our study, all our patients were put on insulin therapy (100%) on admission. According to Doumbia N. *et al.*, [5], 61.7% and 25.5% of patients were taking insulin and oral antidiabetics, respectively, while 12.8% had no antidiabetic treatment. Djibril A M.

et al., [6]; N'Djim F *et al.*, [10] and Elazizi L. *et al.*, [13] achieved insulin therapy of 75.81%, 95.7% and 77.20% respectively.

The association Amoxicillin + Clavanic acid + Metronidazole was the most used probabilistic antibiotic therapy in our series with 29.03% of cases. For Doumbia N. *et al.*, [5] and Mohamed T. [14], the medical treatment was mainly Amoxicillin + metronidazole in 38.29% and 31.1% of patients respectively.

In our study, the surgical treatment was conservative (flattening: 38.71%; necrosectomy; 41.94%; toe disarticulation 12.90%) versus 6.45% leg amputation. Doumbia N. *et al.*, [5] reported 38.29% amputation. According to Djibril A M. *et al.*, [6] 51.61% of patients had undergone limb amputation. Traoré D *et al.*, [15] reported 51.61% amputation. Sidibé AT *et al.*, [16] and Merad MS *et al.*, [17] respectively reported 41.36% and 34% amputations in their studies.

The amputation site was the leg in our 100% series. According to Doumbia N. *et al.*, [5] the amputation site was the lower 1/3 of the leg: 24.3% in the upper 1/3 of the leg: 16.3%. For Sanir *et al.*, [7] the amputation site was the foot: 62.2% followed by the leg: 29.7% and the thigh: 8.1%.

The evolution was favorable in 80.64% of patients in our series. For Doumbia N. *et al.*, [5] the evolution was favorable in 90.4% of cases. Koffi D [18] and Assia EL Ouarradi [19] reported a favorable outcome in 91.70% and 71% of patients respectively.

CONCLUSION

The diabetic foot is a complex and serious pathology of diabetes. It requires a structured approach based on rapid diagnosis and emergency care within the framework of specialized structures involving a multidisciplinary team. Prevention is a priority to sensitize and educate the patient in order to reduce the incidence of ulcerations and consequently amputations.

The limitations of the Study

- Retrospective study in which the collection of data came from the medical records of hospitalized patients, which were often incompletely completed (insufficient completeness of records).

- The high cost of additional examinations for uninsured patients, hence the exclusion of many patients.
- The limited sampling and the short duration of the study.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGEMENTS

We thank all the staff of the hospital of Kayes, the CHU Point G, Point G hospital internal medicine department, National Center for Scientific and Technological Research (CNRST) and the Faculty of Medicine of Bamako Mali.

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