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Epidemiological Aspects of Osteoarticular and Rheumatological Diseases Related to Diabetes in Niger

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Abstract

Type 1 or 2 diabetes can be complicated by numerous non-specific joint conditions. Sometimes revealing, these affections are frequent but often remain unrecognized. However, they are the cause of a significant functional handicap. The objective of this work is to describe the osteoarticular rheumatological disorders in diabetics consulting or hospitalized in the rheumatology and internal medicine departments of the National Hospital of Niamey and the Magori Polyclinic. This was a cross-sectional study at the Rheumatology Department in collaboration with the Internal Medicine Department within the National Hospital of Niamey and Polyclinic Magori over a period of 7 months (December 2018 to July 2019). One hundred (100) diabetic patients with osteoarticular diseases were collected, 75% of whom were women with a female/male sex ratio of 0.33. The average age was 56 years with extremes of 21 and 90 years. Forty-three percent (43%) of the patients had diabetes for more than 10 years, with an average age of 13 years. The average BMI was 28.08 ± 5.42 kg/m^2. Poor glycemic control was found in the majority of patients (92%). Gonarthrosis was the most common disease associated with diabetes (89%). In the context of joint stiffening syndrome, the most frequent problem was a protruding finger, found in 4% of patients, followed by retractile capsulitis in 3% of the 100 cases. Infectious complications were dominated by septic arthritis in 4% of patients. The presence of one or more degenerative complications of diabetes (nephropathy, retinopathy, nephropathy) was the most frequent factor associated with osteoarticular diseases in our diabetic patients. This work underlines the great variety and frequency of osteoar-

ticular affections during diabetes, hence the interest in optimal glycemic control of a close collaboration between rheumatologists and endocrinologists in order to avoid as much as possible the development of these rheumatological affections which are the source of pain and functional handicap, being able to even engage the vital prognosis.

Keywords

Diabetes, Osteoarticular Rheumatological Diseases, Niamey

1. Introduction

Diabetes, one of the four priority non-communicable diseases (NCDs), is the most common endocrine pathology, which is undergoing a rapid epidemiological expansion in the world and is becoming a public health problem that does not spare Africa [1] [2]. In Niger, the situation of diabetes is worrying, according to the STEP <WISE> survey carried out in 2007, the prevalence of diabetes has increased to 4.3%, *i.e.* an evolution of 215% in five years, whereas it was 2% in the general population according to the World Health Organization (WHO) report in 2002 [3]. It is clearly established that improving glycemic control prevents the occurrence of diabetes-related diseases. However, poorly controlled diabetes exposes patients to a wide range of long-term health problems, including rheumatological and osteoarticular manifestations, which are often ignored, even though they may constitute a major handicap in daily life [4]. Bone and joint complications of diabetes are frequent and diverse. Some are the direct consequence of chronic hyperglycemia and its effect on collagen such as cheiroarthropathy, adhesive capsulitis, Dupuytren's disease…Other rheumatological manifestations are simply associated with diabetes without its role being directly incriminated [4]. These include ensheathing vertebral hyperostosis. The aim of this study was to contribute to the improvement of the management of patients living with osteoarticular rheumatological diseases related to diabetes in Niamey.

2. Materials and Method

This was a cross-sectional study that took place over 7 months from December 2018 to July 2019. The sampling was comprehensive consisting of 100 patients with diabetes.

In this study, diabetics with adult osteoarticular rheumatological diseases were included in the endocrinology consultation during the study period.

The parameters studied were sociodemographic, sociocultural, socioeconomic variables, residence context, clinical and paraclinical variables, current treatment and diabetes data.

The data were entered using SPSS software version 26. The graphs were edited on Microsoft Excel 2019 after making a data entry mask and word processing.

For the comparison of the results, the statistical tests were as follows: The qualitative variables were compared using the chi2 test with a level of significance ($p < 0.05$). Quantitative variables were compared using the paired sample t-Student test with one level of significance ($p < 0.05$).

3. Results

3.1. Epidemiological Aspects

Among the 1457 diabetic patients who consulted the endocrinology-diabetes department and 1030 patients who consulted the rheumatology department at the National Hospital of Niamey (HNN) and the Magori Polyclinic (PCM) during the study period, 100 diabetic patients with osteoarticular rheumatological conditions were recorded, *i.e.* a frequency of 14.25% (Figure 1).

Among these patients, the female sex was the most represented with a frequency of 75%, *i.e.* a sex ratio of 0.33.

The average age was 56 ± 10 years with a minimum of 21 years and a maximum of 90 years. The age group of 40 to 60 years was the most represented, followed by 60 years and over with 59% and 37% respectively.

Patients who lived in urban areas were 91% and 9% were from rural areas.

Type 2 diabetes was the most frequently observed with a frequency of 86%. Type 1 diabetes accounted for 13%.

The average duration of diabetes was 13 ± 8.72 years. The most common duration of diabetes was between 5 and 10 years with a frequency of 30%. 43% of the patients had diabetes that exceeded 10 years.

3.2. Clinical Aspects

Type of osteoarticular rheumatological condition

Osteoarthritis was the most common disease, found in 89% of our patients. In the context of joint stiffening syndrome, the most frequent problem was a protruding finger, found in 4% of patients (Table 1).

The average time to onset was 11 years with extremes of 9 months to 22 years.

The onset of stress was the most represented in the patients with a frequency of 80%.

Knee involvement was the most common with a frequency of 58%, followed by the lumbar spine and hips which represented 20% and 15% successively (Table 2).

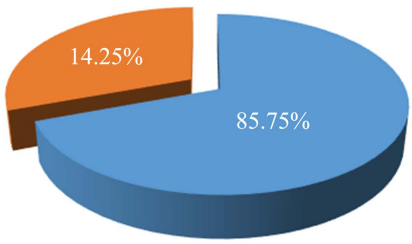

Figure 1. Distribution of patients by frequency of joint disease.

Table 1. Distribution of patients by type of rheumatologic osteoarticular condition.

Osteoarticular diagnosis rheumatologic	Number	Proportion
Gonarthrosis	36	36%
Early osteoarthesis lumbarthrosis	27	27%
Cervical osteoarthrosis	2	2%
Gonarthrose	15	15%
Advanced osteoarthrisis lumbarthrosis	8	8%
Cervical osteoarthrisis	1	1%
Arthritis	4	4%
Protruding finger	4	4%
Retractile capsulitis	3	3%

Table 2. Distribution of patients by site of onset.

Location of occurrence	Number	Proportion
Knee	58	58%
Lumbar	20	20%
Hips	15	15%
Hand	4	4%
Shoulders	3	3%

Patients with unilateral involvement accounted for 68% of cases and 32% had bilateral involvement.

The patients who had presented a limitation of mobilities (flexion and/or extension) were 32%.

3.3. Associated Complications

Neuropathy was the most represented microangiopathic complication with a frequency of 50%, followed by retinopathy which accounted for 25%.

The patients who had presented a macroangiopathic complication represented 9%, of which: 8% for stroke and 1% for myocardial infarction.

High blood pressure was the main cardiovascular risk factor with a frequency of 52%, followed by age with a frequency of 23%. Hypercholesterolemia and sedentary lifestyle represented a low frequency with 6% and 4% respectively.

3.4. Therapeutic Aspects

Oral antidiabetic drugs (OADs) were the treatment taken in 70% of patients, followed by 13% of patients using conventional therapy.

For osteoarticular rheumatological conditions, all patients had received symptomatic treatment.

4. Discussion/Comments

The female sex represented 75% against 25% male, with a sex Ratio M/F of 0.33. These results are similar to those of Mahamat Abdoulaye OK [5] in Niger in 2018 who found 74.80% against 25.20% male and Bazouti S in Morocco [6] in 2013 who found 76% against 24% male.

This female predominance in our study (75%) can be explained by the regularity of consultations observed in women but also by the predominance of obesity in the Nigerian female population. Indeed, a Nigerian study has noted the predominance of obesity in the Nigerian female population (a study carried out in 2018 by Mahamat Abdoulaye OK [5] concluded that obesity was essentially correlated with the female sex ($p = 0.035$)).

The average age of our patients was 56 ± 10 years (with the extremes of age between 20 years and 90 years), the most affected age range was between 40 and 60 years; joining the series of Bazouti S [6] in Morocco in 2013 which is 61 years, higher than the results of Ouédraogo [7] in Burkina Faso in 2009 which was 55 years. According to the IDF the age range most affected by diabetes in 2019 was between 20 and 79 years (463 million people) [1]. The most representative age range in our study was within this range.

This would be linked to the continuous progression of diabetes in Niger, itself the consequence of several factors: the lengthening of life expectancy, the increase with age, the sedentary lifestyle and obesity and also the more active detection of the disease from a certain age.

The resided in urban areas, particularly in Niamey accounted for 91% of cases, compared to 8% who lived in rural areas. In 2019, according to IDF [1] among people living with diabetes, those living in urban areas (310.3 millions) outnumbered those in rural areas (152.6 millions). The prevalence in urban areas was 10.8% and in rural areas 7.2%. Mohibaca Baco R [8] in Niger in 2020, and Zakou B [9] in Niger in 2016 had found similar results to ours with respectively 91.10%; and 87.90% of patients residing in urban areas. This predominance of patients from the capital could also be related to the fact that the study took place in Niamey, the capital, which is an urban center.

Type 2 diabetics predominated in our sample with 86% against 13% of type 1 diabetes. These results were close to those of Mohibaca baco R [8] in Niger in 2020 and Bencharif M [10] in 2018 in Algeria who had found respectively 92.70% and 93.50% of type 2 diabetes against 7.30% and 6.50% of type 1 diabetes. Ouédraogo M *et al.* [7] in Burkina Faso had found a predominance of type 2 diabetes with a frequency of 91.77%.

This result is consistent with the IDF [2] findings that Type 2 diabetes is the most common form of the disease and accounts for approximately 90% of all cases.

The average duration of diabetes was 13 ± 8.72 years. Our results are comparable to those of Bazouti S [6] in Morocco in 2013 who found a mean duration of 12.5 years.

This would probably be related to the illiteracy and advanced age of our study population. Forgetting treatment would be the first cause of non-compliance in our patients, especially since most of them are taking multiple medications (antihypertensive, hypolipidemic, antiplatelet agent, etc.).

In fact, in industrialized countries, forgetfulness is reported in almost 100% of cases of non-compliance, particularly in people over 65 years of age. Consequently, poor glycemic control is noted in 83% of this series.

Retractile capsulitis was found in 3% of patients. Our results are similar to those of Ouédraogo [7] in Burkina Faso in 2009 who found 3.6%. They are higher than those of Ashish [11] in India in 2011 and Ardic [12] in Turkey in 2003 who found respectively 0.32% and 1.3%. We note that retractile capsulitis is more frequent in our patients compared to other series. Neuropathy, overweight, lack of physical activity and poor compliance were the factors associated with the occurrence of retractile capsulitis of the shoulder.

The protruding finger was present in 4% of our patients. Our results are comparable to other series in the literature: Ardic [12] in Turkey in 2003 and Susan [13] in Saudi Arabia in 2012 who found 3.8% and 4.4% respectively. Our results are below those of Ouedrago [7] in Burkina Faso in 2009 and Bazouti S [6] in Morocco in 2013 who found respectively 7.3% and 6.9%. In the literature, clubbed fingers occur in 4% - 10% of cases during diabetes [14]. Our results are included in this range.

Osteoarthritis was the most frequently observed rheumatological involvement in our patients with a frequency of 89%. Our results are similar to those of Bazouti S [6] in Morocco in 2013 who found a frequency of 102%.

In our study, the presence of neuropathy was the only risk factor associated with gonarthrosis. On the other hand, high body mass index and age were not retained as risk factors in diabetics in our study. Diabetic neuropathy leads to muscle weakness and ligament laxity, which may promote Osteoarthritis.

In our study, the most found microangiopathic degenerative complication was Neuropathy with a frequency of 40%, which is similar to the results of Susan in 2012 in Saudi Arabia who had found 47%. These results are higher than that of Bazouti S [6] in 2013 in Morocco who had found 38% cases of peripheral neuropathy.

High blood pressure and age were the main risk factors found in our patients with a frequency of 52% and 23% respectively, dyslipidemia and sedentary lifestyle represented 6% and 4% respectively.

Mahamane Sani MA *et al.* [15] in Niger in 2018 had found that the main cardiovascular risk factors associated with diabetes were sedentary lifestyle, high blood pressure and dyslipidemias with 85.6%, 75.2% and 48.8% respectively. El Boukhrissi F *et al.* [16] in Morocco in 2017 had found a prevalence of arterial hypertension (AH) of 32%, and 18% of dyslipidemia. In this study, the fact that hypertension and age are the main risk factors associated with diabetes is more in line with the literature and this contrast allows us to talk about the concept of "cardiovascular risk" because hypertension is less and less considered as an indi-

vidual pathological entity and its management is no longer based solely on blood pressure figures but rather on a set of arguments taking into account, in addition to blood pressure values, age, sex, blood glucose, cholesterol and cardiovascular history [16] [17].

5. Conclusions

At the end of this study, it was found that the population was mostly made up of young adults in their fifties, with a standard of living considered average for the most part, and residing in urban areas.

Osteoarticular rheumatological conditions were the most frequent, including osteoarthritis, arthritis, protruding fingers and retractile capsulitis of the shoulder. The most frequent site of damage was the knee, with a unilateral character, most often occurring with effort, associated or not with a limitation of the mobility of the limb concerned. The multiple complications associated with diabetes were peripheral neuropathy, retinopathy and nephropathy.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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