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Original Research Article

Ear, nose and throat disorders found in diabetic patients

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ABSTRACT

Background: Diabetes, a non-communicable metabolic disease in perfect growth in the world, poses a problem of neurovascular dysfunction in the inner ear and the secondary immunodeficiency it causes gives a particular character to the clinical course of certain diseases of the ear, nose and throat (ENT) organs. Objective were to find out the prevalence of otorhinolaryngological disorders in patients with diabetes mellitus who presented themselves to the endocrinology and ENT departments of the Mali hospital, the diabetes center and the district hospital IV Bamako (Mali).
Methods: The patients of the various departments concerned in our study, all benefited from screening consultations, we collected the data: socio-demographic, clinical and paraclinical, the management of the ENT disease and the ongoing treatment of diabetes.
Results: ENT pathologies represented 2.08% of consultations of diabetic patients with a female predominance. The 46-55 age group represented 39.53%. Diabetes was type 2 in 91% of cases and fasting hyperglycemia was found in 65.12% of patients. Auditory neuropathy, influenzae rhinitis, otitis media were the common ENT diseases found in type 2 diabetics and in patients with a blood glucose greater than 1.80 gm/l.
Conclusions: Diabetes, a non-communicable metabolic disease in perfect growth in the world, causes a problem of neurovascular dysfunction in the inner ear and the secondary immunodeficiency it causes gives a particular character to the clinical course of certain disorders of the ENT organs. Auditory neuropathy, influenzae rhinitis, otitis media were the common ENT diseases found in type 2 diabetics.

Keywords: Diabetes, ENT disorders, Management

INTRODUCTION

Otorhinolaryngological diseases (ENT) by their evolutions can be complicated by affecting other organs (heart, joints, kidney, brain, lungs), it must also be considered that in return the organs ENT undergo the influence of some general diseases (hypertension, diabetes, cerebrospinal meningitis, tropical fevers).[1,2] Noncommunicable diseases (NCDs) are the leading causes of death in the world. According to the world health organization (WHO), in 2008, 36.1 million people died of conditions such as heart disease, stroke, chronic lung diseases, cancer and diabetes. This represents more than 60% of deaths worldwide.[3-5] Otolaryngologists and general practitioners should be alert to specific conditions related to DM and be minded of the relevant complications and consequences.[6-10]

Objective

Objective was to describe ENT pathologies in patients with diabetes.

METHODS

Framework of study

Our study took place in three health structures: The diabetes control center, district hospital IV Bamako and the Mali hospital (3rd reference hospital).

Type and period of study

This was a descriptive, cross-sectional prospective study that ran from March 2016 to February 2017.

Inclusion criteria

Was included in our study, all patients consulting for diabetes and presenting disorders of the ENT areas.

Criteria of non-inclusion

Diabetic patients with no disorders of the ENT field and those who did not agree to submit to the survey.

Selection of samples

All diabetic patients presenting in the services and units of their care structures were the size of our sample.

Method of data collection

The information was collected by the patient interview and the paraclinical investigations.

Variables studied

Variables studied were-socio-demographic situation (age, sex, residence, ethnicity). Socio-economic situation (occupation, housing, social charge, treatment costs). Clinical data (Type of diabetes, presence of diabetes complications, associated ENT signs). Paraclinical data (glycemia, sinus radiography, audiometry, nasofibroscopy, impedancemetry, ear samples).

Data entry and analysis was done using the software epi info7. Statistical analysis was performed using the software epi info 7.

Ethical considerations

This study was conducted with the agreement of the administrators of the three health structures of the study. The informed consent of the patients was clearly verbal explained, always asked and obtained.

RESULTS

A total of 86 patients met the inclusion criteria of the study on 4946 diabetic patients seen in consultation during the study period, a prevalence of 2.08%.

Descriptive study

Sociodemographic data

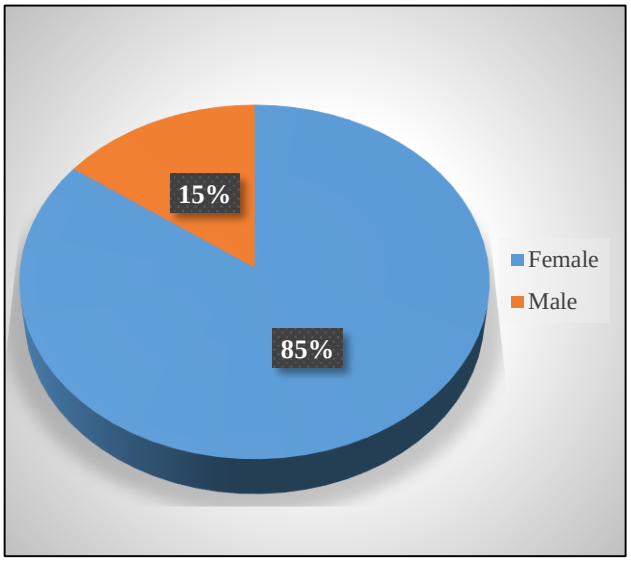

Figure 1: Distribution of gender.

Females accounted for 85%. The sex ratio at 0.17.

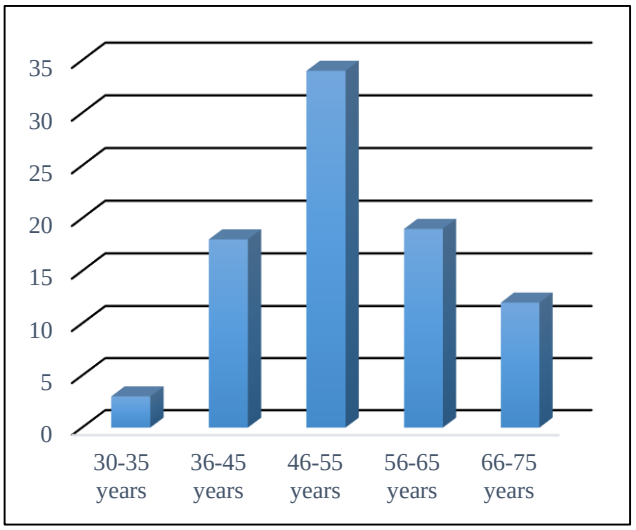

Figure 2: Distribution by age group.

The 46-55 age group represented 39.53%. The subjects' age interval ranged from 30 to 75 years (mean: 53 years).

Table 1: Distribution of socio-professional activity.

Profession	Frequency	Percentages (%)
House-wife	52	60.47
Public employee	11	12.79
Private employee	11	12.79
Trader	5	5.81
Retired	7	8.14
Total	86	100

Housewives accounted for 60.47%.

Clinical data

Table 2: Distribution by medical history.

Medical background	Frequency	Percentages (%)
Peptic ulcer	46	41.07
High BP	41	36.61
No history	21	18.75
Asthma	2	1.78
Sickle cell anemia	2	1.78

Peptic ulcer medical history reported in 39.32% documented in 11 and undocumented in 35 patients.

Table 3: Distribution by family history.

Family history	Frequency	Percentages (%)
Diabetes	52	56.52
No history	31	33.69
High BP	5	5.43
Asthme	2	2.17
Sickle cell anemia	2	2.17
Peptic ulcer	0	0

Diabetes was the family history found in 56.52%.

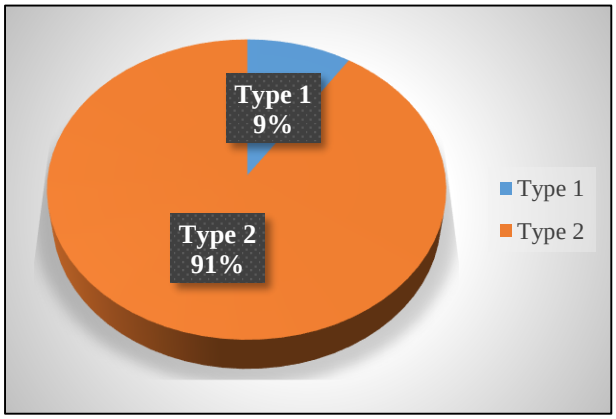

Figure 3: Distribution according to type of diabetes.

Diabetes was type 2 in 91% of cases.

Table 4: Distribution according to blood glucose levels.

Blood glucose level (gm/l)	Frequency	Percentages (%)
<1.26	30	34.88
1.26-1.80	21	24.42
>1.80	35	40.70
Total	86	100,00

Fasting hyperglycemia was found in 65.12% of patients. The average blood glucose of our patients was 1.82±0.55 gm/l with extremes ranging from 0.71 to 5.54 g/l.

Table 5: Distribution by treatment for diabetes.

Treatment	Frequency	Percentages (%)
Hygiene-dietary diet	86	100
Oral antidiabetics	55	63.95
Insulin	27	31.40
Oral antidiabetics + insulin	4	4.65

All our patients were on a hygiene-dietetic diet, i.e., 100% of cases.

Oral antidiabetics intake was found in 63.95% of cases.

Table 6: Distribution by duration of diabetes progression.

Duration of diabetes (Years)	Frequency	Percentages (%)
Less than 5	46	53.49
6 to 10	21	24.42
More than 10	19	22.09
Total	86	100

More than half of the patients had diabetes progressing in the interval 0 to 5 years or 53.49%.

Table 7: Relationship between ENT diseases and diabetes type.

Type of diabetes	Affection orl, n (%)					
	Auditory neuropathy		Influenzae rhinitis		Otitis media	
	Yes	No	Yes	No	Yes	No
Type 1	1 (4.76)	7 (10.77)	6 (30)	2 (3.03)	0 (0)	8 (11.11)
Type 2	20 (95.24)	58 (89.23)	14 (70)	64 (96.97)	14 (100)	64 (88.89)
Total	21 (100)	65 (100)	20 (100)	66 (100)	14 (100)	72 (100)
Chi²	0,1536		10,2289		0.6510	
P	0.6951		0.0014		0.4198	

Auditory neuropathy, influenzae rhinitis, otitis media were the common conditions found in type 2 diabetics (95.24%, 70%, and 100% respectively). There is no statistically significant relationship between the type of diabetes and the occurrence of auditory neuropathy nor between otitis media and the type of diabetes. However,

there is a relationship between the type of diabetes and the occurrence of influenzae rhinitis. Note that 70% of patients who had influenza rhinitis were type 2 diabetic.

Table 8 : Distribution by diabetes complications.

Complications	Frequency	Percentages (%)
Neuropathy	65	75.58
Retinopathy	0	00
Macroangiopathy	2	2.33
Nephropathy	0	0
Macroangiopathy + neuropathy	1	1.16
Neuropathy + retinopathy	4	4.65
Uncomplicated	14	16.28
Total	86	100

Diabetic neuropathy was found in 75.58%.

DISCUSSION

Frequency

During our study period in the various health facilities, we registered 4946 diabetic patients in consultations and among whom 86 presented ENT disorders, a prevalence of 2.08% of ENT disorders in diabetic subjects.

Several studies have been carried out in this direction and some authors have reported much higher proportions than we found. Keita et al found on 281 patients, a hospital prevalence of 33%.[6]

Mokhtar et al in Tunisia provided a prevalence of 17% in 100 type 2 diabetics carrying an infection.[11]

The low frequency of ENT disorders in diabetics in this series is explained on the one hand by the size of the sample and on the other hand by the management of diabetics on an outpatient basis.

Socio-demographic aspect

Place: The diabetes center was the place in 72% were surveyed. This could be explained by the number of visits per week (3 times) during the study as well as the increased attendance of the center by diabetics.

Age: The age group represented in our study was 46-55 years (39.53%). This is explained by the attendance of the center much more by adults than by young people, hence the predominance of type 2 diabetes which is diabetes of the 2nd age. Keita et al found 75% of the 55 years and older age group.[6]

Sex: The female sex was found in 84.88%. This female predominance of endocrine diseases is also reported in the literature (sedentary lifestyle, genetics).

Residence: Almost all of our patients resided in Bamako, i.e., 86.05%. Among these residents, those living in communes IV and V were more represented. This is due to the fact that the study concerned only the district of Bamako and the proximity to the places of investigation. Keita et al found 78.9% lived in urban areas.

Marital status: The bride and groom accounted for 70.93%. Adults made up the majority of the study population.

Socio-economic aspects

Level of education and occupation: Of the patients, 46.51% were out of school. This can be explained by the fact that out-of-school housewives constituted the majority of patients identified (60.47%).

Patients with 0-6 children accounted for 76.74% and those with a number of caregivers other than children not exceeding 3 accounted for 79.07%. At this level, there is an impact on socio-economic level and the subsequent influence on health status.

ENT determinants

The untimely use of cotton swabs predominated in 48.96%. This practice promotes the occurrence of infection by microtrauma or by blocking earwax plugs that impair hearing.

Clinical aspects

Type of diabetes: Type 2 diabetes was found in 91% of cases. This is also reported in the literature which says that 90% of diabetics are type 2. Our results are similar to those of Keita et al who found that T2DM dominated the series with 94.6%.[6]

Glycemic range

Fasting hyperglycemia was found in 65.12% of patients. This justifies the occurrence of infection in diabetics at the occurrence of otorhinolaryngological (glycemic imbalance and threshold of risk of infection or appearance of microangiopathy). Keita et al found 84.6% fasting hyperglycemia.[6] These results could also be explained by the non-compliance with the therapeutic education received by patients, and the appointments given by doctors.

Complications of diabetes

Diabetes mellitus is the most common endocrine disease, characterized by chronic hyperglycemia. The hyperglycemic milieu leads to endothelial injury in blood vessels of variant size, which results in microangiopathy and macroangiopathy (atherosclerosis). Consequential ischemia of nerves and hyperglycemia by itself lead to nerve degeneration and generalized neuropathy, affecting

most often the sensory peripheral nerves and the autonomic nervous system. Auditory, vestibular and olfactory sensorium may be compromised by diabetes mellitus.[3,4,6,10]

Neuropathy was found in 88.46% of cases. It is the most common and earliest complication reported by the literature at 60%.[12] This also explains the high frequency of auditory neuropathy in our study. Achy et al reported that 72.72% of auditory neuropathies were associated with neuritis of the lower limbs.[13]

Diabetes treatment

In our study 100% of patients were on hygiene-dietary diet combined with 63.95% on ADO and 31.40% on insulin. Namely that the same patient could have several associated treatments. This explains the use of insulin in T2DM as a result of hyperglycemia and the insulin-curence.

Repeated ENT disease

In our study, 47.67% of our patients suffered from repeated ENT disease. Glycemic imbalance, quality of management or repeated contact with the factors contributing to these conditions could be the reasons.

Consultation units

Diabetological consultation units accounted for 97.19%. This is explained by the fact that the management of diabetic patients suffering from ENT disease, was done by diabetologists in the first place, who after additional examinations or therapeutic failure, would refer to the ENT specialist.

ENT signs found during interrogation

Headache, tinnitus, rhinorrhea, earache, cough and sneeze were the most frequent signs found during interrogation at 46.51%. Several ENT conditions are manifested by these signs. The clinical examination is then important because most diabetics during a diabetological consultation did not report an ENT complaint. The clinical picture was polymorphic, associating the atrial form (tinnitus, otalgia, and headache) with the nasal form (rhinorrhea, nasal obstruction).

Additional examinations

Only 14 out of 86 patients performed the additional examinations requested. The low socioeconomic level can have an impact on health status and the management of conditions. Among these examinations performed, the x-ray of the sinuses was the most performed and this due to its lower cost compared to the others. Those who completed the exams over a period of 2 to 5 days accounted for 42.58%.

Frequent ENT pathologies found in association with diabetes

Auditory neuropathy, viral rhinitis, otitis media were the main ENT diseases found or 55.55%. Keita A. et al found rhinosinusitis in 75% of cases.[6] This could be explained on the one hand by the fact that diabetes is considered a risk factor for hearing loss. Auditory neuropathy by affecting microangiopathy of the inner ear thus altering the cochlea and on the other hand immunosuppression induced by diabetes, source of infections, malignant otitis externa, which are rare in general population. Recovery from infections or from injuries may be compromised by coexisting with the diabetes mellitus.[14-16]

Another study by researchers at McGill university in Montreal (Canada) showed that the percentage of hearing-impaired people varies from 44 to 70% in diabetics, while it only goes from 20 to 50% in non-diabetics.[14]

It has been shown in a scientific study by imperial college in London that the flu vaccine improves the living conditions of diabetics.[17]

Relationship between auditory neuropathy and diabetes complications

Auditory neuropathy was more found in patients with diabetic neuropathy.

Some of the most common complications of diabetes are damage to blood vessels and nerves, structures that are also present in the ear.[4,6,7,18,19]

Relationship between auditory neuropathy, sex and age groups

Auditory neuropathy was the common condition in females (90.48%) and in the 46-55 age group (33.33%). Our results are identical to those of the study conducted in the United States by Derek et al who state that women with diabetes, especially those in the 60 to 75 age group, are more likely to lose their hearing as they age, especially if their diabetes is not balanced.[20]

Relationship between ENT disorders and glycemic slices

Auditory neuropathy, viral rhinitis and otitis media were common in the glycemic band >1.80 gm/l (42.86%, 55%, 50%). This confirms the link between glycemic imbalance and the occurrence of ENT disease.

Coverage and cost of the prescription

The average cost of expenditure was 10365 local money (16 US dollars) with extremes ranging from 1825 FCFA local money (3 US dollars) to 24825 FCFA (39 US dollars). This confirms a certain socioeconomic impact of ENT diseases on diabetes because most specific products

for ENT diseases are not on the WHO list of essential medicines and very often require ENT specialists to prescribe very expensive pharmaceutical specialties for the majority of populations suffering from extreme poverty in the country.[21]

Duration of treatment

Patients whose treatment lasted from 16 to 30 days accounted for 47.67%. This testifies to the severity and complexity of ENT conditions in diabetics, hence the need for rapid and adequate management.

Limitations

Due to lack of technical means we have not been able to further explore the ear of patients suffering from diabetes, such as vestibular disorders. Due to a lack of financial resources in patients, the bacteriological study of the rhino-sinus and ear was not requested, it would have allowed us to conduct a rational therapy guided by the germs found in the samples.

CONCLUSION

Our study shows that even if the frequency of ENT diseases in patients suffering from diabetes is not so high, it should not lead us to a neglect of these conditions, supposed to impact the condition of its patients, who already suffer enormously from their diabetes.

The 46-55 age group was mainly concerned, with type 2 diabetes in the majority of cases. Auditory neuropathy, viral rhinitis and otitis media were the commonly found ENT conditions. In front of a glycemic imbalance, an ENT pathology must be sought.

Recommendations

We noted a socioeconomic impact of ENT diseases on diabetes in the non-performance of the majority of additional examinations requested as well as in the management because most of the specific products intended for ENT diseases are not on the WHO list of essential medicines and induce the prescription of pharmaceutical specialties often very expensive.

It is therefore desirable to take this factor into account, in order to reduce the cost ofthe management of diabetic patients suffering from ENT diseases

Most diabetics during a diabetological consultation did not report an ENT complaint and in the few rare times they did, the management was done by the diabetologists in the first place, who after additional examinations or therapeutic failure, would refer to the ENT specialist.

This situation requires health personnel caring for diabetic patients to strengthen their capacities in primary ENT care through continuing education programs for adequate patient care.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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