

Assessment of Diabetes Among Workers in a Brewery in Guinea in 2022

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Abstract: *Introduction:* Diabetes is a metabolic disease characterized by persistently high blood glucose levels resulting from decreased insulin secretion and/or activity. It is encountered in all age groups, especially adults. However, it can constitute difficulties in obtaining a job because of the appearance of its possible complications which can modify the physical capacities of diabetic workers. The aim of this study was to study diabetes among workers in breweries in Conakry. *Material and Methods:* This was a cross-sectional study of descriptive and analytical type with a duration of 6 months, from July 1 to December 31, 2021, which included all the workers in the breweries that had an infirmary. *Results:* 13.1% of the workers had diabetes with a male predominance of 92.7% and a sex ratio of 12.67. Most of the workers were manual workers (65.8%) and also had an occupational seniority ranging from 1 to 10 years. Type 2 diabetes was dominant (90.2%) and 64.6% of the workers had poor diabetes follow-up. Hypertension, metabolic syndrome, male gender, work breaks, work rhythm and work schedule were statistically significant with diabetes follow-up with respective P-values of 0.04; 0.03; 0.01; 0.001 and 0.00. *Conclusion:* The diabetes-work interrelationship is multiple and depends on the disease profile and workstation characteristics. Our study shows that the frequency of diabetes in breweries in Conakry is not negligible, i.e. 13.1%. Shift work, irregular meal times, non-compliance with the diabetic diet and physical workload are among the factors influencing regular monitoring of diabetes in the workplace.

Keywords: Diabetes, Work, Breweries, Conakry

1. Introduction

Diabetes is a metabolic disease characterized by persistently high blood glucose levels resulting from decreased insulin secretion and/or activity. It is frequently encountered in all age groups, especially adults [1].

However, diabetes can cause difficulties in obtaining a job because of its possible complications that can modify the physical capacities of diabetic workers [1].

The impact of diabetes on the lives of workers varies from person to person, resulting in many difficulties such as absenteeism, risk of hypoglycemia at work, therapeutic constraints, job discrimination and reduced profitability [2]. Factors such as meal schedule adjustment and workload can

be a real problem for workers with diabetes in the workplace [3].

The global prevalence of diabetes has almost doubled since 1980, from 4.7% to 8.5% of the adult population in 2014 according to the first World Health Organization (WHO) report [4].

In the United Kingdom, ALASTAIR M et al. in 2005 in a study on the frequency, severity and morbidity of hypoglycemia occurring in the workplace in people with diabetes treated with insulin had reported a prevalence of 11.1% of type 2 diabetes [5].

In Algeria, BENINI A et al. in 2017 in a study on a cohort of diabetic shift workers in an Algerian company found in 132 diabetic shift workers, a mean annual incidence of diabetes 7 ± 5.7 new cases/year [5].

In Morocco, HARAJ N *et al* in 2016 in a study on the diabetic patient in the workplace had reported that 62.6% of diabetic patients in the workplace lived with type 2 and 56.3% of workers were under insulin therapy [6].

It is within this framework that we initiated this study whose general objective was to evaluate diabetes in workers of a brewery in Conakry.

2. Methodology

Framework of the study

Three (3) breweries in Guinea were used as a framework for the realization of this study, they are

- 1) The Non-Alcoholic Drink of Guinea (BONAGUI)
- 2) The Company of breweries of Guinea (SOBRAGUI)
- 3) SALAM juice manufacturing plant (SALAM)

They ensure the production and marketing of alcoholic and non-alcoholic drinks.

Equipment

The workers of the breweries in the city of Conakry constituted our study material.

Collection media and tools: a pre-established survey form, individual medical records of the workers, a blood pressure meter, a height gauge and a bathroom scale.

Methods

2.1. Type and Duration of Study

This was a descriptive and analytical cross-sectional study lasting 6 months from July 1 to December 31, 2021.

Selection criteria

Inclusion criteria

All known diabetic workers who were present and agreed to participate in the study.

Non-inclusion criteria

Known diabetic workers who were absent or those who did not consent to the study.

2.2. Study Variables

The variables were quantitative and qualitative, divided into three types of data: socioprofessional data, clinical data, and data related to the experiences of workers with diabetes in the workplace.

Socio-professional data

Sex Age Marital status: Residence Length of employment:

Clinical data Body mass index (BMI)

Data entry, analysis and presentation:

Data were entered and analyzed using Microsoft Pack Office 2016 and Epi Info 7.4.0 software.

2.3. Ethical Considerations

The information collected was managed in strict confidentiality and with respect for medical confidentiality.

3. Discussion

From July 2021 to December 2021, we collated 580

workers in the breweries among whom 82 were living with diabetes in the workplace or a frequency of 13.1%. BRAHEM A *et al.* in TUNISIA [7] in 2016 in a study on the impact of diabetes on work activity found a frequency of 5.1%.

This shows that diabetes presents a real public health problem whether in the population or in the workplace. Changes in dietary and behavioral patterns in some shift workers in industrial settings may constitute increased risks for the occurrence of metabolic disease.

The physical and repetitive nature of the tasks in the industrial sector with sometimes restrictive ergonomic conditions could explain this male predominance in these breweries.

The average length of service was 11.7 years with extremes of 1 and 30 years. More than half (51.22%) of the workers had a job seniority of 1 to 10 years. HOSSINI OL *et al.* in Morocco in 2020 [8] reported an average job tenure of 18.3 years. On the other hand, the average length of service for diabetes was 6.57 years.

This result could be explained on the one hand by the fact that these workers entered the workplace at a very young age, and on the other hand by genetic predisposition and poor dietary hygiene.

65.85% of the workers performed shift work and 34.15% performed exclusive day work. HOSSINI OL *et al.* in MOROCCO in 2020 [9] reported that 67.9% of employees worked atypical hours.

Workers represented 65.85% of diabetic workers. MARMOUCH H *et al.* in TUNISIA in 2019 found that blue collar workers were the most affected occupational class with 90% [9].

Companies recruit according to their needs and the organization of the company to ensure continuous production.

In our study, 42.7% of the workers were hypertensive. BRAHEM A *et al.* in TUNISIA in 2016 [10] highlighted 51.5% of hypertension in diabetic workers.

The stress generated during work with atypical schedules with consumption of vices on the one hand and pathological changes such as dyslipidemia and obesity encountered during chronic hyperglycemia on the other hand constitute risks of occurrence of hypertension.

13.41% of workers had chronic complications. HOSSINI OL *et al.* in MOROCCO in 2020 [11] reported that 73.3% of the workers had presented acute and/or chronic complications.

The low rate found in our study could prove that the workers try to follow their treatment well in order to always maintain their health.

More than half (64.6%) of the diabetic workers had irregular diabetes follow-up. HARAJ N *et al* [5] reported that 72.8% of diabetic workers had a poor diabetes follow-up plan. On the other hand, HOSSINI OL *et al.* in MOROCCO in 2020 [12] reported 57.9% of workers had good diabetes follow-up.

This could be explained not only by neglect of the disease but also by a lack of professional management.

22.0% of workers worked more than 8 hours a day. BRAHEM A et al. in TUNISIA in 2016 [13] reported that 17.82% of diabetics worked overtime.

87.8% of diabetic workers had a moderate physical load. LOUDA F et al. in MOROCCO in 2012 [13] found that 70% are workers and have an intense physical load.

This could be explained by the fact that in some jobs the workload is high, which requires the extra working hours.

In our population, 85.4% of workers informed their entourage of their diabetic condition. AMRANI Z et al. in MOROCCO in 2015 [14] had reported that 92% of workers informed their professional entourage of their disease. This could guide the entourage in decisions in case of emergency.

85.4% of diabetic workers had a regular meal schedule and 96.3% reported that the meals at the canteen did not respect the diabetic diet. LOUDA F et al. in MOROCCO in 2012 [15] reported 78% of workers had work schedules that were incompatible with meal times and treatment intake, and 67% found it difficult to follow the diet at work.

This could be explained by the fact that workers are given an hour break and meals are for all workers without distinction.

Only 1 worker, or 1.22% of the workers were absent due to illness. LOUDA F et al. in MOROCCO in 2012 [16] reported 45% absenteeism due to diabetes.....

No worker was temporarily or permanently incapacitated and 1.2% of the workers had received a professional reclassification secondary to their diabetes. FAVROT et al. in LUXEMBOURG in 2013 [17] reported that 11.2% of diabetic workers were concerned by decisions of temporary or permanent unfitness.

HARAJ N et al [18] reported that 15.6% of people with diabetes had to undergo occupational reclassification because of their disease.

This result could be explained by the fact that diabetes is not yet at a very advanced stage in workers.

Diabetes could have an influence on the socio-professional future of the worker when it is not under control, it is often discovered during regulatory visits.

Arterial hypertension and metabolic syndrome were statistically significant with diabetes follow-up with respective P-values of 0.04 and 0.03. Inactivation of moderate physical activity and noncompliance with diabetic diets could explain these results.

Male gender correlated with diabetes follow-up ($p=0.01$).

Work breaks, work rhythm and work schedule were significantly related to diabetes follow-up. HARAJ N et al [5] found in their studies that heavy physical load, hypoglycemia and work schedule incompatibility were the main factors influencing diabetes management in the workplace.

Overtime, lack of breaks at work, and work schedule prolonged the duration of exposure to occupational nuisances that could interfere with monitoring.

4. Conclusion

The interrelationship between diabetes and work is

multiple and depends on the profile of the disease and the characteristics of the workstation. Our study shows that the frequency of diabetes in breweries in Conakry is not negligible, i.e. 13.1%.

Shift work, irregular meal times, non-compliance with the diabetic diet and physical workload are among the factors influencing regular monitoring of diabetes in the workplace. Medical surveillance and management were lacking in most diabetic workers despite the means put in place (existence of infirmary, management) in these industries.

Further studies on the influence of diabetes on occupational outcomes and its impact on productivity will allow us to better understand these phenomena in the workplace.

List of Abbreviations

OAMI: Obliterative Forelimb Injury

ATCD: Antecedents

CDD: Contract for a definite period

CDI: Contract for an indefinite period

GDM: Gestational Diabetes

T1DM: Type 1 diabetes

T2DM: Type 2 diabetes

IDF: International Diabetes Federation

FSTS: Faculty of Health Sciences and Techniques

HbA1c: Glycated hemoglobin

HTA: High Blood Pressure

BMI: Body Mass Index

WHO: World Health Organization

BP: Blood Pressure

DBP: Diastolic Blood Pressure

PAS: Systolic Blood Pressure

MCNT: Chronic Non-Communicable Diseases

UGANC: Gamal Abdel Nasser University of Conakry

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