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Original Research Article

Prevalence of Prediabetes among Tuberculosis Patients Attending DOTS Clinic in a Tertiary Hospital in Nigeria

Sunday Adebayo Owolabi[1*], Ayinmode Babatunde[1], Amoko Ampitan[1], Ogunjemilua Sunday Bode[1], Badmus Funsho Habeeb[1], Olugbenga Tomisin[1], Yusuf Adebayo Ramat[1], Kuranga Suleiman Ibrahim[1], Owoyemi Ayodeji John[2]

[1]Department of Family Medicine, University of Ilorin Teaching Hospital, Nigeria
[2]Department of Family Medicine, Ekiti State University Teaching Hospital/Ekiti State University (EKSUTH/EKSU), Ekiti State Nigeria

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Abstract: ***Background:*** There exists a strong association between prediabetes and TB, which brings about disease activation, relapse and several other unfavourable treatment outcomes among TB patients. The association between prediabetes and TB have also revealed a concomitant increase in the prevalence of prediabetes among TB patients. This study determined the prevalence of prediabetes among tuberculosis patients attending the DOTS clinic of the University of Ilorin Teaching Hospital (UITH) Nigeria. ***Method:*** This was a cross-sectional study involving one hundred and eighty consenting TB patients, selected using systematic random sampling techniques. Socio-demographic data was collected using a questionnaire. Laboratory investigation was done using NICE guidelines to determine the prevalence of prediabetes among TB patients. Demographic information was entered, calculated and analysed using Statistical Packages for Social Sciences (SPSS 23). ***Results:*** The age of the participants ranged from 18 to 95 years with a mean age of 37 (SD ± 15.01). The prevalence of prediabetes among TB patients was 8.9%. ***Conclusions:*** The study showed a high prevalence of prediabetes among TB patients attending DOTS clinics at UITH, Ilorin.

Keywords: Prediabetes, Tuberculosis, Prevalence, Patients.

INTRODUCTION

Prediabetes is characterised by an aberrant glucose homeostasis in which blood glucose levels are elevated above those that are regarded as normal but not to the extent necessary to diagnose diabetes [1]. The classification of prediabetes as a unique pathogenic state is debatable because it is a condition that exists between healthy glucose homeostasis and the pathological condition of diabetes [1]. Tuberculosis (TB) on the other hand is a global public health challenge and the leading cause of death from infectious diseases in developing countries especially sub-Saharan Africa in which Nigeria is particularly affected [2, 3]. However, various research efforts have reported a strong association between prediabetes and TB [4,5, 6], including TB disease activation, relapse and several other unfavourable treatment outcomes [5]. The association between prediabetes and TB have also revealed a concomitant increase in the prevalence of prediabetes among TB patients [2, 8-12].

Despite the numerous studies on screening for prediabetes among TB patients, there are limited studies in the North Central zone of Nigeria particularly in Ilorin. There is a need for an increased effort to screen for prediabetes among TB patients. This study is highly expedient because TB patients constitute a significant population among primary care patients warranting a special clinic, such as the Direct Observed Therapy Shortcourse (DOTS). Identification and management of chronic non-communicable diseases like prediabetes and diabetes in patients with TB is of great importance to the practice of Family Medicine. An understanding of how common prediabetes is among TB patients will help in promoting the health of TB patients and help the family physicians in patient care. Given the increasing prevalence of prediabetes worldwide and its potential role in tuberculosis prognosis as alluded to above, the study finds it crucial to determine the prevalence of prediabetes among tuberculosis patients attending the DOTS clinic of the University of Ilorin Teaching Hospital (UITH), Ilorin. Nigeria.

METHODOLOGY

This hospital-based descriptive cross-sectional study was conducted in tuberculosis clinics (DOTS) of the University of Ilorin Teaching Hospital (UITH), Ilorin, Kwara state. A systematic random sampling

***Corresponding Author:** Sunday Adebayo Owolabi
Department of Family Medicine, University of Ilorin Teaching Hospital, Nigeria

technique was used to select a total of 180 consenting TB patients who matched the inclusion criteria of the study. Inclusion criteria include all consenting patients (18 years old and above) attending TB clinic, UITH. Exclusion criteria include patients diagnosed with major psychiatric disorders or acutely ill patients requiring emergency care to avoid inappropriate response, and patients known with haemoglobinopathies, iron deficiency anaemia, chronic kidney disease, and chronic liver disease to avoid inaccurate Hb1Ac results. A questionnaire was used to obtain information on demographic information. About 5mls of venous blood sample was collected via venipuncture into an ethylene-diamine-tetra-acetic acid (EDTA) sample bottle for glycated haemoglobin analysis. Universal precautions were observed during sample collection. According to the hospital waste management policy, all needles, sharps, and other medical waste were properly disposed of. The blood sample was then transported to the University of Ilorin Teaching Hospital Chemical Pathology Laboratory for glycated haemoglobin analysis. The cut-off value of 6-6.4% is regarded as prediabetes, as recommended by the National Institute for Clinical Excellence (NICE) [13, 14]. Demographic information was entered, calculated and analysed using Statistical Packages for Social Sciences (SPSS-23). Approval to undertake the study was obtained from the Ethical Review Committee of the University of Ilorin Teaching Hospital with ERC number: NHREC/02/05/2010.

RESULT

Table 1: Socio-demographic Characteristics of the Participants (N=180)

Variables	Frequency	Percentage (%)
Age Groups		
≤ 20	23	12.8
21 – 40	95	52.8
41 – 60	49	27.2
>60	13	7.2
Mean ± SD (Range) {37 ± 15.01 (18 – 95)}		
Gender		
Male	129	71.7
Female	51	28.3
Religion		
Christianity	28	15.6
Islam	150	83.3
Traditional	2	1.1
Marital Status		
Married	104	57.8
Single	76	42.2
Divorced/Separated	0	0.0
Type of family		
Monogamous	118	65.6
Polygamous	62	34.4
Level of education		
Tertiary	56	31.1
Secondary	66	36.7
Primary	34	18.9
No formal education	24	13.3
Occupation		
Civil servant	16	8.9
Private workers	136	75.6
Unemployed	28	15.5
Ethnicity		
Hausa	17	9.4
Yoruba	148	82.2
*Others	15	8.3
Income ('000)		
≤ 30	64	35.6
> 30	116	64.4

Baruba, Nupe, Ibo, Fulani

Table 1 present the socio-demographic characteristics of the respondents. The age of the respondents ranged from 18 to 95 years with a mean age of 37 (SD ± 15.01). Respondents in the age group 21-40 years had the highest representation (52.8%) while those who were older than 60 years represented the least (7.2%). Participants were predominantly male (71.7%) with male to female ratio of 2.5:1. More than half (57.8%) of the participants were married and close to two-third (65.6%) of the subjects were from the monogamous family setting. Approximately one-third (31.1%) of them had tertiary education level, 66 (36.7%) had secondary education, 34 (18.9%) had primary level of education while 24 (13.3%) had no formal education. Most (82.2%) of the participants were from the Yoruba ethnic group and those who were practicing Islam were more predominant (83.3%). About three-quarters (75.6%) of the participants were private workers and close to two-thirds (64.4%) of them earned above Nigerian minimum wage (₦30,000:00).

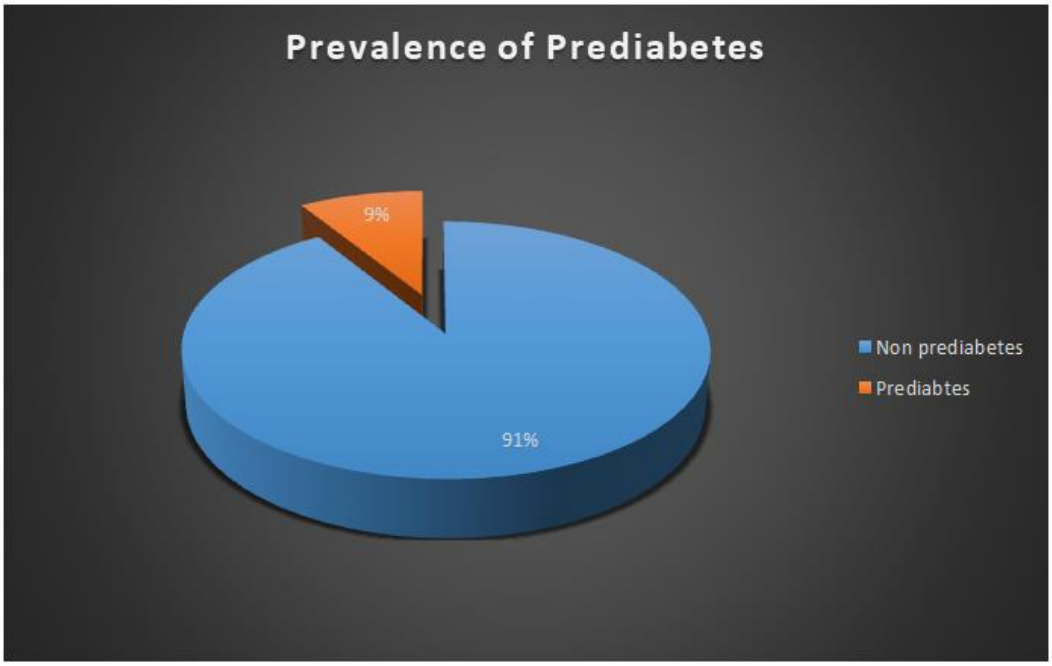

Figure 1: Prevalence of Prediabetes

Figure 1 shows that the prevalence of prediabetes was 8.9% among the participants. Using the NICE [13, 14] classification of prediabetes, the prevalence of prediabetes in this study was high.

DISCUSSION

In this study, the prevalence of prediabetes was found to be 8.9%. This implies that about 1 in 10 adult patients with TB had prediabetes. This was comparable to the finding by Sarker et al. in Bangladesh, South Asia, where it was reported that 15.5% of TB patients who participated in a community-based cross-sectional study across eleven DOTS centres had prediabetes [10]. The finding from this present study could also be compared to the finding of Araia *et al*., in Eritrea, a country in East Africa, where the prediabetic among TB patients was found to be 10.4% in a hospital-based cross-sectional study among TB patients [15]. In Nigeria, Anyanwu et al. in Oyo state, in another hospital-based cross-sectional study among TB patients found that the prevalence of prediabetes was 7.4% [16]. This report can also be compared to the 10.4% pooled prevalence of prediabetes in the general population in Nigeria as reported by the International Diabetes Federation [17]. Hence, the prevalence of prediabetes found in this present study may just be a reflection of what is obtainable in the general population in Nigeria. However, in contrast to the findings of this present study, a higher prevalence was reported in India by Kodiatte *et al*., and Viswanathan et al. in separate studies where prediabetes among TB patients was 28% and 24.5% respectively [8, 4]. The difference observed in the prevalence rate might not be unconnected with a different population of study and also the geographical location of the population studied, the guideline used as a reference range to calculate prediabetes prevalence. However, prospective longitudinal case-control studies may be needed to confirm this among TB patients in Nigeria. Primary care providers must be aware of the high prevalence of prediabetes and be ready to screen all TB patients to provide holistic care, thereby improving the overall health of the patients and by extension, the entire nation.

CONCLUSION

The study revealed that the prevalence of prediabetes among TB patients was high with about one in ten having prediabetes. Regular screening of TB patients for prediabetes should be routine as a policy in DOTS clinics.

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Conflicts of interest: None

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