

PREVALENCE OF SELF-REPORTED LOW BACK PAIN AMONG PATIENTS WITH TYPE 2 DIABETES MELLITUS: A PRELIMINARY SURVEY

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ABSTRACT

Background: Low Back Pain (LBP) is increasingly becoming a major health concern among patients with type-2 diabetes mellitus (T2DM) who are often times managed primarily for their diabetic related problems at the expense of other musculoskeletal conditions.

Objective: This preliminary survey aimed to determine if prevalence of self-reported LBP (srLBP) and disability in patients with T2DM was comparable to that of patients without T2DM.

Design: Cross-sectional study.

Methods: Socio-demographic and clinical data were obtained from 143 patients with T2DM receiving treatment at Federal Medical Centre, Ido-Ekiti, Nigeria. The twelve month and point prevalence of srLBP was thereafter compared between the 143 individuals with T2DM and 143 age and sex matched apparently healthy controls. Pain intensity, disability and care-seeking practices for LBP were then compared between T2DM patients with srLBP and their age and sex matched non-diabetic patients with srLBP.

Results: Twelve months and point prevalence of srLBP was higher among patients with T2DM (46.2%, 41.3%) than their age and sex matched non-diabetic counterparts (31.5%, 12.6%). Compared with non-diabetic patients, those with T2DM reported higher disability scores ($U=1029.0$, $p=0.001$) despite reporting lower pain intensities (4.15 ± 2.15 vs. 4.75 ± 0.76 , $p=0.05$).

Conclusion: Low back pain should be accorded necessary attention when treating patients with T2DM.

Keywords: Low back pain, Type 2 diabetes mellitus, Prevalence

INTRODUCTION

Low Back Pain (LBP) is a pain or discomfort localised between the twelfth rib and the inferior gluteal folds, with or without radiating pain (1). It is the most common musculoskeletal disorder and is considered to be a leading cause of work-related disability, absence from work, activity limitation and participation restriction worldwide (2,3). Low back pain is also widely regarded as a bio-psychosocial problem frequently affecting quality of life including family and social relationships of individuals. Based on duration and recurrence, LBP can be classified as acute, sub-acute, chronic and recurrent. Furthermore, LBP could be specific or non-specific (1). Non-specific low back pain is described as a mechanical back pain of musculoskeletal origin in which symptoms vary with physical activity and is not associated with a known underlying pathology (4). The non-specific type of LBP accounts for majority of the cases of LBP complaints (5).

Evidence is emerging on links between musculoskeletal problems including LBP and some

attributes of type-2 diabetes mellitus (T2DM) such as hyperglycemia, glycosylation of proteins, neuropathy, reduced muscular strength, reduced muscular flexibility and increased adiposity (6-8). Although causal relationships between musculoskeletal problems and T2DM have not been established, associations between the two have been documented (9). While majority of the studies reporting musculoskeletal disorders among patients with T2DM focused majorly on problems affecting the upper and lower extremities (10), there is a dearth of studies on prevalence of LBP among patients with T2DM. Musculoskeletal complaints (e.g. LBP) among individuals with T2DM are often times missed or not given adequate attention in daily clinical practice (11). This may be due to the total attention given to attendant life-threatening complications such as neuropathy, nephropathy, retinopathy, cardiovascular problems and diabetic foot ulcers at the expense of LBP (7). As a result, patients may continue to suffer in silence from what could be managed alongside other complications. To the best of our knowledge, only a study by Eivazi and Abadi (7) reported the prevalence

of LBP in a well-defined T2DM population. More so, it is not known if the burden of LBP in terms of disability is comparable between patients with T2DM and those without. As a first stage in a series of studies, this preliminary survey was undertaken to determine the prevalence of self-reported LBP (srLBP) in a well-defined T2DM population and also to compare the burden of LBP disability between patients with and without additional T2DM.

MATERIALS AND METHODS

A cross-sectional study design was adopted for the purpose of this study. The study was carried out in two stages. Stage one involved the recruitment of individuals receiving treatment exclusively for T2DM over a minimum period of six months and their age and sex matched apparently healthy controls. Participants with T2DM were recruited from the Endocrinology clinic of Federal Medical Centre, Ido-Ekiti, a tertiary health facility located in a rural community in South-West Nigeria. The age and sex-matched consenting individuals that served as controls were recruited from the same community. Ethical approval in accordance with the Declaration of Helsinki was obtained from the Health Research and Ethics committee of Federal Medical Centre, Ido-Ekiti, Nigeria. Socio-demographic and clinical data were extracted from the case notes of the 143 patients with T2DM receiving treatment at the centre. This number represents the total number of participants in the centre who provided consent to participate in the study. Thereafter, a survey form fashioned towards the Standardized Nordic Questionnaire for analysis of musculoskeletal symptoms (12) was used to elicit information on 12-month and point prevalence of srLBP from both patients with T2DM ($n = 143$) and their apparently healthy controls ($n = 143$). They were asked to respond to questions that say “in the *last 12 months*, have you at any time suffered from any back problem that includes any or a combination aches, pain, discomfort, hurt?” and “in the *last 7 days*, have you at any time suffered from any back problem that includes any or a combination aches, pain, discomfort, hurt?”

The second stage of the study involved matching those T2DM patients found to be having ongoing complaints of srLBP with their age and sex-matched patients reporting srLBP but not diabetic. Pain intensity and disability as measured by the Visual Analogue Scale (VAS) and Oswestry Low Back Pain Disability Questionnaire [OLBPDQ] (13) were then compared between the two groups. Scoring on the OLBPDQ takes about 3-5 minutes to complete. Test-retest reliability (of an interval of 4 days) has been documented to be 0.91. A question on care-seeking practices as regards

LBP management was also asked. This was compared between the patients with T2DM who had srLBP and their non-diabetic counterparts who presented with srLBP. Data was analyzed using descriptive and inferential statistics at $p < 0.05$. Statistical Package for Social Sciences (IBM SPSS) version 20 was used for data analysis.

RESULTS

Majority of the participants with T2DM that were surveyed in the first stage of this cross-sectional study were self-employed (45.4%), married (65%) and above the age of 60 years (48.3%). Their socio-demographic characteristics are presented in Table 1. The mean durations of diagnosis of T2DM of the male and female participants were 4.50 ± 5.78 and 4.20 ± 5.83 years respectively. The Body Mass Index (BMI) and average Fasting Blood Sugar (FBS) of participants with T2DM are shown in Table 2.

Table 1
Socio-demographic characteristics of participants with type 2 diabetes mellitus

Variable	Frequency	(%)
Gender		
Male	66	46.20
Female	77	53.80
Occupational status		
Self-employed	65	45.40
Unemployed	16	11.20
Civil servant	26	18.20
Retired	36	25.20
Age group		
31-40	19	13.30
41-50	13	9.00
51-60	42	29.40
Above 60	69	48.30
Marital status		
Single	13	9.10
Married	93	65.00
Divorced	16	11.20
Widowed	21	14.70
Education		
None	38	26.57
Primary	19	13.29
Polytechnic	22	15.38
College	44	30.77
University	20	13.99

Table 2*Clinical characteristics of participants with type 2 diabetes*

Variable	Frequency	(%)
Body mass index		
<25kg/m ²	32	22.40
25-30kg/m ²	70	49.00
>30kg/m ²	41	28.60
Average fasting blood sugar		
<4mmol/L	14	9.80
4-7mmol/L	98	68.50
>7mmol/L	31	21.70

Twelve months (46.2%) and point prevalence (41.3%) of srLBP was significantly higher among the patients with T2DM than their age and sex matched counterparts which was 31.5% and 12.6% respectively. Going by the 12 months prevalence among patients with T2DM, srLBP was found to be significantly more prevalent among: females (57.10 %, df=1, $\chi^2 = 8.12$, p = 0.004); individuals above the age of 60 years (59.4%, df=3, $\chi^2 = 12.79$, p=0.005), those with primary level education (78.90%, df=4, $\chi^2 = 18.58$, p=0.001) and among those whose fasting blood sugar levels were above 7mmol/L (83.90%, df=2, $\chi^2 = 23.00$, p=0.000) (Table 3).

Table 3

Association between socio-demographic and clinical variables and the prevalence of self-reported low back pain among patients with type 2 diabetes mellitus

	12 months prevalence		χ^2	P
	Yes (N, %)	No (N, %)		
8.12 0.004				
Gender				
Male	22 (33.30)	44 (66.70)		
Female	44 (57.10)	33 (42.90)		
Age group				
31-40	3 (15.80)	16 (84.20)	12.79	0.005
41-50	5 (38.50)	8 (61.50)		
51-60	17 (40.50)	25 (59.50)		
61 and above	41 (59.40)	28 (40.60)		
Educational level				
None	22 (57.90)	16 (42.10)	18.58	0.001
Primary School	15 (78.90)	4 (21.10)		
Secondary School	7 (31.80)	15 (68.20)		
Polytechnic	12 (27.30)	32 (72.70)		
University	10 (50.00)	10 (50.00)		
Fasting blood sugar				
Below 4mmol/L	6 (42.90)	8 (57.10)	23.00	0.000
4-7 mmol/L	34 (34.70)	64 (65.30)		
>7 mmol/ L	26 (83.90)	5 (16.10)		
Body mass index				
<25kg/m ²	13 (40.60)	19 (59.40)	2.33	0.312
25-30kg/m ²	30 (42.90)	40 (57.10)		
>30kg/m ²	23 (56.10)	18 (43.90)		

In comparison with age and sex matched controls, patients with T2DM had lower VAS scores (4.15 ± 2.15 vs. 4.75 ± 0.76 , $p=0.05$). Among individuals with T2DM, more than half (59.3%) with ongoing complaints of srLBP did not seek medical care while only two persons visited either a doctor or a physiotherapist to treat their back pain. Health-seeking practices between the patients with T2DM who had srLBP and their non-diabetic counterparts who presented with srLBP are shown in Table 4. Patients with T2DM reported higher levels of disability than their non-diabetic counterparts (mean rank = 71.60 vs. 44.70, $U=1029.00$, $p=0.001$).

Table 4

Care seeking practices among patients with on-going complaints of self-reported low back pain

	Patients with T2DM (N, %)	Non- diabetic (N, %)	χ^2	P
Care seeking practices				
Did not seek medical care	35 (59.30)	15 (25.40)	17.60	0.000
Over the counter oral analgesics/topical gels	22 (37.30)	31 (52.50)		
Visited a doctor/physiotherapist	2 (3.40)	13 (22.00)		

DISCUSSION

The results of this study show that the prevalence of self-reported low back pain (srLBP) among patients with T2DM was higher than that of their non-diabetic counterparts. This further supports the evidence that musculoskeletal pain is a common problem in diabetic patients (7,14). Most studies on musculoskeletal disorders among patients with T2DM focused majorly on those that affect the extremities (10,15,16). To the best of our knowledge, this study is one of the few studies that explored the prevalence and associated problems of srLBP in the T2DM population. Although lower, the prevalence of srLBP found among patients with T2DM in this study is comparable to that of Eivazi and Abadi (7) who reported a 12 month LBP prevalence of 63.4% among 317 patients with T2DM. The preponderance of srLBP among female patients with T2DM in this present study is also similar to that of Eivazi and Abadi (7). This is in tandem with studies from the general population where female gender has been identified as a risk factor for the development of LBP (17,18). Obesity has also been associated with increased prevalence of LBP, while associations between increased adiposity measures and the prevalence of LBP have been documented to be

stronger in females than males (19). The higher BMI among females than males in this study might have impacted on the higher prevalence of srLBP among the female patients.

The T2DM participants who had their average blood sugar levels above the optimal range presented with higher prevalence of srLBP than those within or below optimal levels. This is consistent with the commonly documented associations between poor metabolic control and the prevalence of musculoskeletal problems (20). Poor glycaemic control sustained over a long period of time leads to the formation of advanced glycation end products and glycosylation of collagen protein (21). This may alter the structure and the function of the muscles and connective tissues and may imply increased pain.

This study also revealed that both groups of patients with and without T2DM who had ongoing complaints of srLBP did not seek proper care for their back pain problems. Studies have shown that the levels of knowledge regarding the course and treatment of LBP is low in this environment (22,23). It is possible that the level of awareness on the causes and possible management options of LBP in these populations were low. Comparing health seeking practices towards the management of LBP, results showed that those patients with LBP but without T2DM sought treatment (either by visiting a physiotherapist or a doctor) more than their diabetic counterparts. Patients with T2DM may be confronted with numerous problems which include retinopathy, nephropathy, coronary artery disease, neuropathy and foot ulcers. This could have affected their drive to seek redress for the seemingly non-life-threatening musculoskeletal problems. This may often be compounded by the fact that the managing physicians also prioritize and address "the most pressing or serious symptoms first" (11). As such, conditions such as retinopathy, nephropathy, coronary artery disease, neuropathy, and foot ulcers may therefore be prioritized at the detriment of LBP. However, the pain and physical disability brought about by these untreated musculoskeletal conditions not only affects functioning and mental health, but also diminish the patients' quality of life and may prevent the individuals from optimally self-managing their T2DM (24). The management of LBP therefore should be accorded necessary attention when treating patients with T2DM.

It is also interesting to note that the patients with T2DM had increased disability as a result of LBP than their non-diabetic counterparts even though they had lower pain intensities. The reason for this is unknown; however, it is possible that their disability scores are moderated by challenges across medical management, strict adherence to dietary instructions and managing negative emotions such as fear and depression. This could further impact on the disability levels of the patients. Furthermore, reduced muscle strength and

other intrinsic factors found to be predominant in extremity problems (e.g. joint stiffness and loss of flexibility) which may present around the low back may also further increase their disability (12).

A major strong point of this study is the fact that it has provided data on one year and on-the-spot self-report of LBP by patients with T2DM, a data that has provided information on the possible burden of LBP and the need for further studies on the burden of musculoskeletal disorders among this group of patients. This data is currently not widely available. There are however, a number of limitations to this study. The fact that the LBP under investigation was self-reported is one limitation that needs to be mentioned and results interpreted in that context. At this stage, the study relied on the responses of the participants but not yet confirmed by any radiological or imaging techniques. The priority at this point was to work with what the patients had reported by themselves. The next stage of the study is envisaged to cover real diagnosis of LBP. Another limitation had to do with the unavailability of results for glycosylated haemoglobin (HbA_{1c}) in the records of the patients which necessitated the use of average blood sugar scores of the participants. The health facility from where this study was conducted is located in a rural setting and facility for HbA_{1c} was not available. Lastly, the fact that data were obtained from recall questionnaires means that possibility of under or over-reporting cannot be ruled out; and the cross-sectional design of this study is also limiting as cause and effect relationships are not ascertainable.

CONCLUSION

Self-reported LBP is more prevalent in patients with T2DM than those without T2DM. Disability from LBP is also higher in diabetic patients with on-going complaints of LBP than those without T2DM. Further studies on prevalence of other musculoskeletal pain syndromes among patients with T2DM are worthy of being explored.

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