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Research Article

**PREVALENCE AND CORRELATES OF PAIN IN FATIGUED
PATIENTS WITH TYPE 1 DIABETES.**¹Dr Hira Sattar, ²Dr Noshaba Akbar, ³Dr Zubia Ikram¹MBBS, Sharif Medical and Dental College, Lahore.²MBBS, University Medical and Dental College, Faisalabad.³MBBS, Ameer ud Din Medical College, Lahore.**Article Received:** February 2020**Accepted:** March 2020**Published:** April 2020**Abstract:**

Multiple conditions and complications are linked with diabetes mellitus which are well known cause of pain. Mostly in type 1 and type 2 diabetes, there is painful peripheral neuropathy which is micro-vascular complication and affecting almost 16% of them. Other painful co-morbidities which have rheumatic manifestations in diabetes such as entrapment neuropathy and cheiroarthopathy are well associated with pain. Pain in diabetic patients is not in direct relation to complication of the disease. Literature has reported that in type 2 diabetic patients in which the sample size was 11,689 almost 58% were suffering from moderate to severe pain. It concludes that pain is highly prevalent in diabetic patients.

The current study has showed that pain is prevalent among fatigued participants who were having type 1 diabetes. Diabetes related complications include joint and muscle pain more targeting lower back or headache. Both pain and fatigue severity lead to functional impairment. So, fatigue treatment I type 1 diabetic patients is very important to keep good quality of life and avoid pain ultimately.

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INTRODUCTION:

Multiple conditions and complications are linked with diabetes mellitus which are well known cause of pain. Mostly in type 1 and type 2 diabetes, there is painful peripheral neuropathy which is micro-vascular complication and affecting almost 16% of them. [1] Other painful co-morbidities which have rheumatic manifestations in diabetes such as entrapment neuropathy and cheiroarthopathy are well associated with pain. [2] Pain in diabetic patients is not in direct relation to complication of the disease. [3] Literature has reported that in type 2 diabetic patients in which the sample size was 11,689 almost 58% were suffering from moderate to severe pain. It concludes that pain is highly prevalent in diabetic patients. [4] [5]

The influence of pain in diabetes is considerable as patients suffering from diabetes and co-morbid chronic pain are having lower quality of life in consequences of poor diabetes self management. [6] [7]. Studies have shown that both type 1 and type 2 diabetes are linked with severe and chronic fatigue. [8] [9]. Whereas chronic fatigue is highly prevalent in type 1 diabetes with unpleasant symptoms. [10] Experimental studies have reported that in type 1 diabetes the major factor of pain could be persistent chronic fatigue. [11] And the treatment protocol for such patients is to manage the indefinite pain. A definite relationship of pain and fatigue has explained. Pain has negative effect on patient's health and yet there has no specific cause of the problem identified; specifically, the prevalence and severity of pain, and its associations with psychosocial and clinical variables in fatigued patients with type 1 diabetes. [12]

The aim of the study is to evaluate the prevalence of location severity of pain in fatigued patients with type 1 diabetes and the difference between patients who are suffering with pain and without pain.

Methodology

Out of 300 patients 120 patients were recruited into the study who were already diagnosed with type 1 diabetes. The age ranges between 19 to 60 years. All participants were receiving treatment for diabetes in either way of daily insulin injections or insulin pump therapy.

All patients were severely fatigued and severe fatigue was defined as score equal to or more than 35 on the Checklist individual strength (CIS), subscale fatigue severity and the fatigue had been present from past 6 months. Exclusion criteria were renal failure of moderate or severe level, severe visual impairment, congestive heart failure, history of a stroke in the past five years, BMI of 40 or higher, wheelchair-dependent, and other concurrent

psychiatric or medical co-morbidity that could explain the fatigue. A written informed consent was given to the patients after explaining the purpose of the study. All data information was kept confidential.

Measures:

Pain – prevalence, severity, location and impact
To find out the prevalence and location of pain McGill Pain Questionnaire (MPQ) were used. [13] To spot the pain Visual analogue scale (VAS) was used to measure the intensity of pain at the current time. Whereas the Short Form Health Survey (subscale bodily pain) was used to analyze the severity of pain and its impact over last 4 weeks. [14]

Fatigue severity:

By using subscale fatigue severity Checklist Individual Strength (CIS) the severity of fatigue was analyzed.

Depressive symptoms:

The Beck Depression Inventory Primary Care (BDI-PC) was used to evaluate the depressive symptoms [15]. The BDI-PC consists of seven items scored on a four-point Likert Scale. Scores range from 0 to 21, with higher scores indicating more depressive symptoms.

Functional impairment:

To evaluate the functional impairment Sickness Impact Profile-8 (SIP-8) was used [16], which measures limitations in daily functioning across eight domains: sleep and rest, homemaking, mobility, social interactions, ambulation, leisure activities, alertness behavior and work limitations.

Statistical analysis:

Data was analyzed by using IBM SPSS statistic version 20. Descriptive analysis was mentioned in terms of standard deviation and mean or frequencies and percentages.

To analyze between patients with and without pain Independent t-tests and Chi-square tests were used. Pearson's correlation coefficient was used to assess the association. Linear multiple regression analysis was performed using functional impairment as the dependent variable, and pain assessed with the SF-36 subscale bodily pain and fatigue severity as the independent variables.

RESULTS:

The demographical and clinical characteristics are shown in Table 1. Retinopathy (23%) and neuropathy (19%) were the most frequently reported diabetes-related complications. Out of 120 patients 84 (70%) were presented with pain whereas 36 (30%) had no pain. The duration of

diabetes in years of patients who were having pain was 25.1 whereas patients who were without pain had 21.6. In case of complications 27% were having retinopathy, 6% were having neuropathy, 18% were having numbness in feet, 6% had cardiovascular disease, 2% myocardial disease and 1% stroke.

Severity, location and impact of pain

86% of the participants showed the presence of pain. The mean of VAS was 3.5

The most common location of pain was head and back 35-50%. Whereas remaining participants were presented with shoulders, neck and upper back. Almost 10% of the participants were having pain in their lower limbs and feet. The most frequently reported pain was joint pain (32%), muscle pain (25%), headache (20%) and back pain (14%). The mean pain severity and impact (SF-36 subscale bodily pain) was 66.7.

Differences between patients with and without pain
Patients with and without pain were remarkably different in many variables.

Patients with pain were more often female, experienced more diabetes-related complications, especially neuropathy and more co-morbidity. They scored higher on depressive symptoms, fatigue severity and functioning impairment, but did not differ in age, or diabetes duration, nor on either mean level of physical activity nor type of physical activity. When comparing patients with and without neuropathy in a sub-analysis, we found that patients with neuropathy reported significant higher scores on the SF-36 subscale bodily pain. Furthermore, patients with neuropathy reported significant more pain symptoms in the shoulders, lower arms and hands, and feet, but there was no difference in the prevalence of pain in other locations. We found no difference in fatigue severity.

DISCUSSION:

The current study has showed that participants having type 1 diabetes high rate of pain in fatigued patients. Almost three quarter of the participant of the study has experienced it. Multiple joint pain and muscle pain were mostly explained with symptoms of pain combined with headache and low back pain. The statistics of the current study was similar with another study conducted by Krein and colleagues who were having 60% of diabetic patients with chronic pain. [16] [17]

The most frequently described diabetes-related complications in our sample were retinopathy and

neuropathy. A study has revealed that these complications may cause pain and the prevalence rate is comparable. Patients who were experienced pain were having more diabetes related complications. Which could be due to certain diabetes-related complications which are directly linked with pain. [18]

The current study aimed that patients with pain experienced more depressive symptoms, more severe fatigue and more functional impairments. These factors were also found to be significantly related to pain, which is consistent with other research studying pain and its correlates in diabetes and other conditions. [19] Chronic hyperglycemia is associated with glycation which have been found to be linked to diabetes-related complications, for example limited joint mobility [20]. Poorer HbA1c values have reported more severe pain whereas in this study the relationship diminished when using multivariate analysis. [21]

The non-significant correlation in our study may be explained by the relatively low impact of pain reported by patients, or by our group of severely fatigued patients as no clear relationship has been found between glycemic control (i.e. HbA1c) or glucose variability and fatigue, either in type 1 or type 2 diabetes [22]. As HbA1c values represent patients' mean glucose values over several weeks, and not the daily fluctuations of blood glucose levels including hyperglycemia and hypoglycemia, it would be interesting to investigate the relationship between pain and glucose variability in future studies, as these might be relevant to fatigue. In a previous study, we did not find a clear relationship between fatigue and fluctuations in blood glucose levels [23]. People experiencing pain are often assumed to be less physically active; however, our study found no correlation between the level of physical activity assessed with the mean physical activity score and pain, either with the SF-36 subscale bodily pain.

Both pain and fatigue severity were associated with, and clearly contributed to, functional impairment in daily life. Interventions aimed at fatigue should take account for these findings, addressing pain in order to reduce fatigue and functional limitations, especially in the subgroup of patients with more severe pain.

Therefore, it was not possible to draw conclusions regarding the cause-and-effect relationship between pain and the studied correlates, such as depressive symptoms, the level of physical activity, and clinical variables such as diabetes-related complications.

CONCLUSION:

However, the current study has showed that pain is prevalent among fatigued participants who were having type 1 diabetes. Diabetes related complications include joint and muscle pain more targeting lower back or headache. Both pain and fatigue severity lead to functional impairment. So, fatigue treatment in type 1 diabetic patients is very important to keep good quality of life and avoid pain ultimately.

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