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Original Article

Nutritional Stress as an Adverse Effect of Anti-Diabetic Medications

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Abstract

Objective To estimate the intensity of nutritional stress among the diabetic patients. ***Background*** Non-Communicable diseases (NCDs) are the leading cause of morbidity and mortality in Pakistan. The WHO report evaluated diabetes at the fourth position among the four types of NCD's, this accounts for 1.5 million deaths annually. ***Introduction*** Nutritional stress depends on what we give to our body, whether it is toxin loaded, chemically constituted platefuls of food and expect it to cope without a grumble. As, diabetes is metabolic syndrome so there is an altered carbohydrate and fat metabolism in these patients that will lead to the development of nutritional stress in these patients. ***Methodology*** A cross sectional survey based study was conducted at a local hospital including diabetic patients on anti-diabetic medicines. Demographic data, medical history and drug use duration and dosage were investigated as well as intensity of nutritional stress was calculated by Sadaf stress scale (SSS). The patients with severe and psychological and mental illness or any other chronic illness or patients who were failed to provide reliable information were excluded from study. ***Result*** The total of 42 patients have participated in the study out of that 50% have reported mild nutritional stress and 36% have reported moderate nutritional stress. The most common reported symptom of nutritional stress includes sleep problem, abdominal bloating, incomplete emptying and sugars and carb craving. ***Conclusion*** The patients have reported the nutritional stress due to the altered carbohydrate and fat metabolism and the use of anti-diabetic medicine further increases the intensity of nutritional stress. The symptoms that are reported in diabetic patients are not associated with diabetes instead occur as a result of anti-diabetic medication use. Such as, sleep problem usually associated with increased stress, increased blood pressure, impaired control of blood glucose, and increased inflammation.

Keywords

Non-Communicable Disease, Sadaf Stress Scale, Nutritional Stress, Anti-Diabetic Medication

Introduction

It has long been observed that a person's wellbeing is involved as a major factor which plays a crucial role in prophylaxis of any chronic illness, therefore, emotional wellbeing helps to maintain adherence with the medication in type 2 diabetes. A study by Peyrot discovered that around 70% of clinicians worldwide reported the hindrance of stress and depression while sticking on the medication prescribed, especially in case of diabetic patient where there is tough restriction towards the food they eat. Due the restrictions in selection of food the patient with diabetes are more often observed to face nutritional stress (Peyrot M, et al, 2005).

The guidelines from the ADA and the European Association have declared that the control on diet and involving exercise in routine can help to prevent diabetes and the associated side effects due to its medication (Inzucchi SE, et al, 2012). Nutritional stress depends on what we give to our body, whether it is toxin loaded, chemically constituted platefuls of food and expect it to cope without a grumble.

Diabetes mellitus has become the disease. It has capture worldwide attention due to its dramatic ascent in global prevalence and burdensome cost. There are 246 million people with diabetes worldwide. The international diabetes federation (IDF) calculate that there will be 380 million by 2025 (Rodriguez A, 2011). Fuelling this global explosion in diabetes has an estimated additional 280 million who have pre-diabetes or impaired glucose tolerance.

Diabetes is escalation in Pakistan as there are approximately 7.1 million diabetic patients in Pakistan, and it is calculated to have 11.4 million diabetics and rank 10th in the world wide in 2030 (Shaya FT, 2010). The chronic hyperglycaemia of diabetes is linked with dysfunction, long term damage and failure of various organ particularly the kidney, eyes, nerves, blood vessels and heart (Richard S., 2012). Dysfunctional carbohydrate, protein, fat metabolism in diabetes is associated with the origin of abnormalities which is due to deficient action of insulin on target tissue (Robin Kumar., 2014). In order, to avoid or to limit the complications of diabetes different types of anti-diabetic medications are used. These medications are helpful to maintain the blood glucose level within the normal range and prevent the complications of diabetes (American Diabetes Association, 2012).

As, diabetes is a chronic condition so prolong use of these medications is required. The prolong use of anti-diabetic medications are responsible to develop nutritional stress in diabetic patients and produces a number of side effects that are associated with nutritional stress (Blevins TC, 2010).

These side effects commonly include pallor, irritability, incomplete bowel movements, abdominal bloating and increased blood pressure. These side effects don't have a direct link with diabetes but are present as a consequence of nutritional stress (ADA Clinical Practice, 2013).

Methodology

It was a cross-sectional study which was done on individuals using anti-diabetic medicines to evaluate their nutritional stress. By conducting a questionnaire based survey using first Pakistani stress scale i.e. Sadaf Stress Scale (SSS) comprising on 23 questions regarding the intensity of nutritional stress.

The section of the questionnaire includes demographic data, general information, self and family history of diabetes and co-morbidities, particular medicines used by diabetic patients, symptoms and perceived stress, 50 questionnaires were distributed to enrolled patients out of which 42 patients returned complete forms, 8 forms were incomplete out of which 3 patients who were not comfortable to share their personal information and 5 were those who were not completely aware of the dosage they were taking. Inclusion criteria of the study includes diabetic patients who are on anti-diabetic medicines, excluding patients with any severe psychological and mental illness.

Results

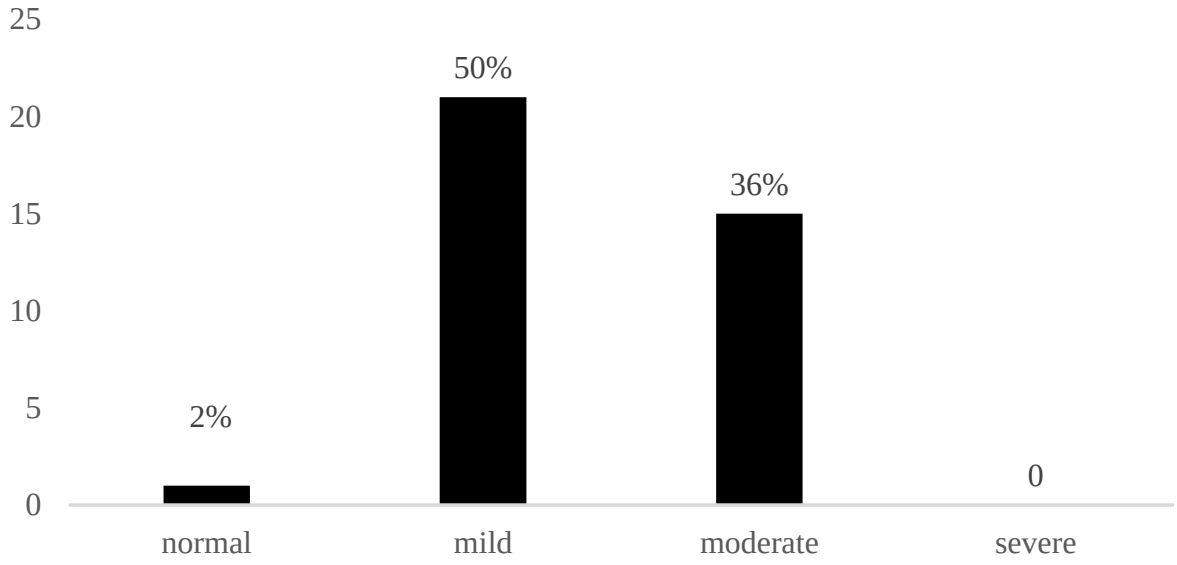

Figure 1 Showing the Comparison of Intensities Reported for Nutritional Stress in Diabetic patients. Only 1 patient i.e. 2% of the study subject reported normal stress level, while, 21 patients i.e. 50% have reported mild stress, 15 patients i.e. 36% have reported moderate stress whereas no patient have reported sever stress levels.

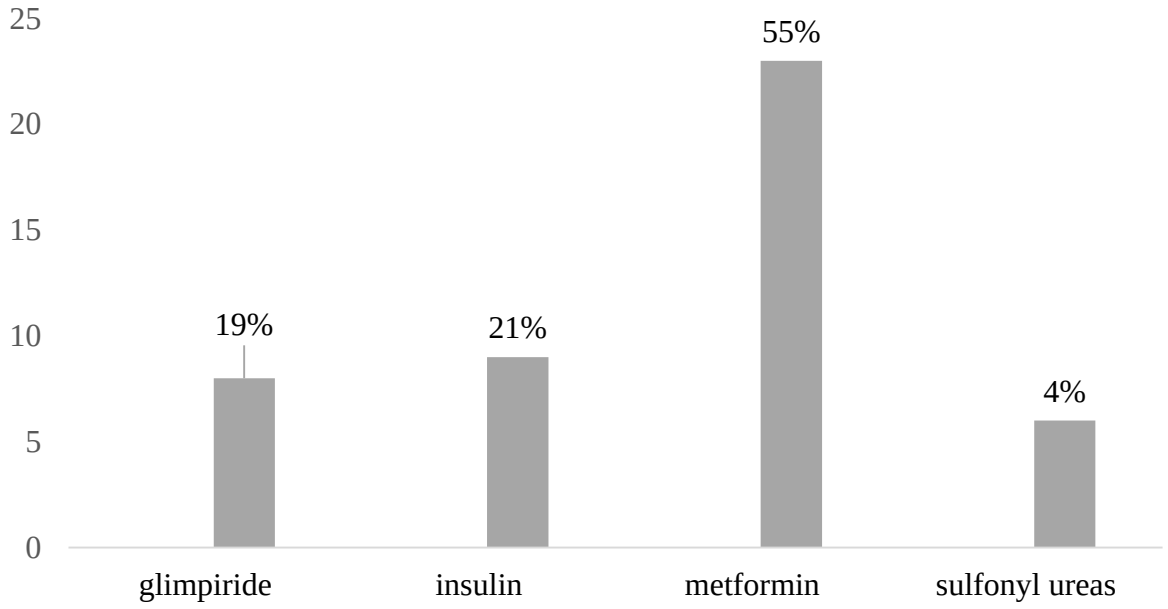

Figure 2 Showing the Most Common Drugs that are given to Diabetic patients. Only 8 patients i.e. 19%were using glimepiride, 9 patients i.e. 21 % were using insulin, 23 patients i.e. 55 % were using metformin and 6 patients i.e. 14% were using sulfonylureas.

Symptoms	Result
Pallor	64%
Decrease Urination	52%
Increased B.P	86%
Sleep problem	98%
Mental Fog	90%
Irritability	90%
Abnormal thirst	92%
Sugar Carbs craving	95%
Abnormal Bowel movement	86%
Pass a hard Stool	76%
Strain frequently during the passage of Stool	86%
Incomplete Bowel emptying	92%
Abdominal Bloating	92%

Table:1 The most common symptoms of nutritional stress that are reported in diabetic patients

Discussion

A malfunctioned metabolism of carbohydrate, fat and protein can lead to the abnormalities and nutritional stress in diabetic patients (Arguedas, et al. 2013). These patients use a number of anti-diabetic medications to maintain the blood glucose levels, however, these medications are being observed to be responsible for the development of nutritional stress and produces a number of side effects (Blevins TC., 2010). This study evaluates that only 2% of patients show the normal stress level, while 50% showed a mild level of stress that can further lead to moderate or severe level of stress depending upon the condition of patient and the acceptance with prophylaxis. The results showed 36% of study population with the moderate level of stress, however, none of the patient was at severity that is quite positive and good sign as shown in figure 1. Moreover, it also shows that 55% of patients are on metformin that is highly prescribed and can lead to the symptoms of nutritional stress. Metformin is an oral medication that is used to maintain blood glucose level normal. However, metformin produces a number of side effects that include, abdominal or stomach discomfort, cough or hoarseness, decreased appetite, diarrhoea, fast or shallow breathing, fever or chills, general feeling of discomfort, lower back or side pain, muscle pain or cramping, painful or difficult urination, sleepiness (Handelsman Y. et al, 2011). Whereas, 21% of the study population were on insulin. Insulin is taken by diabetic patients to keep the glucose levels in control. Side effects produce by insulin include weight gain, renal problem, gastrointestinal distress and allergies. Glimpride were prescribed to 19% of the enrolled patients which is the medium-to long acting sulfonyl urea which was taken by 4% of patients as shown in figure 2. Side effects produce by glimepiride include dizziness, headache, chest pain, abdominal discomfort. In diabetic patients the most reported symptom of nutritional stress is sleep problem. Sleep deprivation usually associated with increased stress, such as increased blood pressure, impaired control of blood glucose, and increased inflammation (Joffe HV, et al. 2010). According to Mahowald, the body's reaction to sleep loss can resemble insulin resistance, a precursor to diabetes. Insulin’s job is to help the body use glucose for energy. In insulin resistance, cells fail to use the

hormone efficiently, resulting in high blood sugar (Leroith D., 2012). The most prevalent symptom observed in diabetic patients with nutritional stress was sleep problem which was 98% and 95% was sugar carbs craving. Whereas, abnormal thirst, incomplete bowel emptying and abnormal bloating were observed to be leading with 92%. The psychotic conditions which included mental fog and irritability were found with 90% in study population. However, the symptom which was less observed in diabetic patients were decreased urination due to the proper intake of medicines as given in above table.

Conclusion

It is concluded that as the use of anti-diabetic medications is essential to maintain the blood glucose levels but it also is responsible for nutritional stress and produces a number of side effects.

Acknowledgment

N/A

Conflict of Interest

N/A

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