

Study of the Level of Awareness of Diabetic Neuropathy among Diabetic Patients in Al-Ahsa Region, Kingdom of Saudi Arabia: A Cross-sectional Study

Bayan Nizar Alhashim¹, Ashraf Zaher², Dawood Salman Albujaays¹, JihadNizarAlhashim¹, Sayed Ibrahim Ali³

¹Medical Intern, Department of Internal Medicine, College of Medicine, King Faisal University, Al-Hasa Region, Saudi Arabia, ²Associate Professor of Neurology, Department of Medicine, College of Medicine, King Faisal University, Al-Hasa Region, Saudi Arabia, ³Assistant Professor of Biostatistics, Department of Family and Community Medicine, College of Medicine, King Faisal University, Al-Hasa Region, Saudi Arabia

Abstract

Introduction: Diabetic neuropathy (DN) is a prevalent complication of type 2 diabetes mellitus (T2DM) with a major impact on the health of the affected patient. Effective screening and treatment strategies for peripheral neuropathy are lacking. This usually results in delay in the diagnosis of DN till it is well established and more difficult to treat. No study has been done before in the Al-Ahsa region, Saudi Arabia. Making it is important to do such kind of studies.

Purpose: To determine the level of awareness of DN among diabetic patients in Al-Ahsa governorate, Kingdom of Saudi Arabia.

Materials and Methods: A retrospective cross-sectional study was conducted in Al-Ahsa region, Kingdom of Saudi Arabia, from November 2016 to July 2017. 329 participants were selected randomly from Al-Ahsa region, aged from 20 years and above using simple random sampling. Data analysis was done using SPSS program version 24.

Results: Mean age (\pm standard deviation) was 47 ± 7 years. 55% of subjects were female. The minimum age of the participants was 20 and the maximum age was 65. More than half of them are in the age group of 20–50 years. The number of male participants is 146 (44.3%) and females 183 (55.7%). The mean score of the level of awareness was 7.1 ± 3.4 . However, Table 2 shows the number of the participants who know that diabetes mellitus can cause diabetic neuropathy are 173 (56.4%). Furthermore, 82 (27.5%) do not know why this condition occurs in diabetes. 76 (20.4%) of the participants have no idea about diabetic neuropathy. As there is lack of awareness among Saudi diabetic population about this problem, there is a strong need for health and educational intervention programs to increase the knowledge level and awareness about this disease.

Conclusion: DN is common and growing problem worldwide but not adequately recognized problem among diabetic population in Al-Ahsa region, Kingdom of Saudi Arabia. The conclusion of this study is there is extremely needed for health, educational and screening programs because the majority of the Saudi diabetic people have lack of awareness about this disease as well as the necessity of periodic follow-up programs.

Key words: Awareness, Diabetic foot, Diabetic neuropathy, Educational intervention programs, Knowledge, Practice, Screening

INTRODUCTION

According to the International Diabetes Federation, 382 million people worldwide are currently diabetic.^[1] It is estimated that 193 million people are diabetic and undiagnosed which raise the risk of DM complication.

Hyperglycemia challenges patients with numerous complications; it can affect the heart and blood vessels, eyes, kidneys, and nerves.^[2] Diabetic patient may present with diabetes complication at the time of diagnosis or only a few years of known poor glycemic control.^[3] DN is a prevalent complication of type 2 diabetes mellitus (T2DM) with a major impact on the health of the affected patient.^[4] DN has been defined by the Toronto consensus panel on DN as a “symmetrical, length-dependent sensorimotor polyneuropathy attributable to metabolic and microvessel alterations as a result of chronic hyperglycemia exposure, and cardiovascular risk covariates.”^[5] The exact pathophysiological processes that result in DN remains

Access this article online



www.ijss-sn.com

Month of Submission : 12-2017
Month of Peer Review : 01-2018
Month of Acceptance : 01-2018
Month of Publishing : 02-2018

Corresponding Author: Bayan Nizar Alhashim, Al-ahsa, Hufuf, Saudi Arabia. Phone: +966567056238. E-mail: memo_candle@hotmail.com

enigmatic, both peripheral and central mechanisms have been implicated and extend from altered channel function in peripheral nerve through enhanced spinal processing and changes in many higher centers.^[6] It is thought to be that the most probable pathophysiology involves biochemical abnormalities causing protein glycation and overproduction of reactive oxygen species, leading to vascular damage and responsive activation of tissue-specific growth/repair systems.^[7] DN encompasses a variety of clinical or subclinical presentations.^[8] Distal symmetrical neuropathy is the most common presentation and accounts for 75% DN. Asymmetrical neuropathies may involve cranial nerves, thoracic or limb nerves are of acute onset resulting from ischemic infarction of vasa nervosa.^[9] In general, DSPN affects the toes and distal foot, but slowly progresses proximally to involve the feet and legs in a “stocking and gloves” distribution. The main clinical consequences of DSPN are foot ulceration and painful neuropathy and result in significant increase in morbidity and mortality.^[10] Interestingly, symptoms cannot be used as indicator of the severity of axonal loss. Often, those with the most severe painful symptoms have minimal or no sensory deficit on examination or electrodiagnostic studies.^[11] Peripheral neuropathy accounts for hospitalization more frequently than other diabetes complications. Peripheral neuropathy recognized as the most frequent cause of non-traumatic amputation.^[12] A major problem with peripheral neuropathy is that this condition usually painless and patients look for medical help only when pain appears. Unfortunately, patients usually presented with well-established foot ulcer and no escape from amputation. Another challenging problem is that current effective screening and treatment strategies for peripheral neuropathy are lacking. This usually results in delay in the diagnosis of DN till it is well established and more difficult to treat.^[13]

MATERIALS AND METHODS

A retrospective cross-sectional study was conducted in Al-Ahsa region, Kingdom of Saudi Arabia, from November 2016 to July 2017. 329 participants were selected randomly from Al-Ahsa region, aged from 20 years and above using simple random sampling to assess the level of awareness toward DN. Data collection was validated by electronic questionnaire. The study population was randomly selected from the population in Al-Ahsa region. The participants were assured that confidentiality would be maintained. After obtaining informed consent, the questionnaire was distributed among the participants. The questionnaire which was prepared consisted of five categories: (1) Sociodemographic data (age, gender, educational level, marital status, daily lifestyle, healthy diet, and regular exercises), (2) early signs and symptoms of the

disease, (3) risk factors, (4) the regular screening, and (5) foot ulcer distributed among diabetic patients in Al-Ahsa region. The questionnaire was pre-tested and translated into Arabic and then back-translated to English to validate the translation.

The level of awareness was assessed on 25 questions about the awareness of the disease. The authors got the approval from Ethical Committee (REC) from King Faisal University. Patients who were diagnosed with diabetes either type 1 or type 2 was included in this study. Patients of age group from 20 to 65 years for both genders (male and female) were included in the study. We excluded the patients who participated from outside the Saudi Arabia. Furthermore, patients of age below 19 or above 65 years were excluded from the study. Data analysis was performed using SPSS (version 24). Chi-square test was run for analyzing qualitative data. *P* values were considered statistically significant if *P* < 0.05.

A total of 329 individuals with diabetes in Al-Hasa city were included in our study. Mean age (\pm standard deviation) was 47 ± 7 years. 55% of subjects were female. The minimum age of the participants was 20 and the maximum age was 65. More than half of them are in the age group of 20–50 years. The number of male participants is 146 (44.3%) and females 183 (55.7%). Average duration of diabetes was ≤ 5 years in 176 (47%), 6–10 years in 98 (28.4%), and ≥ 11 years in 58 (24.6%) individuals.

Primary educational level was found in 15 (2.8%), 53 (17.9%) had secondary, and 261 (79.3%) had academic educational level. The demographic characteristics are shown in Table 1.

The study found that age group (21–50 years) has highest awareness level (22.7%) compared to the other age groups. Another finding in this study was the level of awareness between males and females. 60% of female was aware compared with 40% in male.

In addition, 2.9% was aware in primary educational level compared with 16.8% in secondary school, 56.1% in academic educational level.

Regarding the type of diabetes, type 1 was 21 (6.5%) of the participants. 308 (82.8%) were type 2 diabetic participants. Rest of the participants were not sure about their type. They were 43 (11.6%) patients. The duration of treatment was ≤ 5 years in 189 (53.2%), 6–10 years in 51 (18.6%), and ≥ 11 years in 98 (34.6%) individuals. Most of the participants discovered that they are diabetic in age between 30 and 50 years which equal to 238 (72.5%). The

others were variable, 53 (16.1%) were diabetic \leq 30 years and 38 (11.4%) discovered the disease \geq 50 years.

The mean score of the level of awareness was 7.1 ± 3.4 . However, Table 2 summarizes the number of the participants who know that DM can cause DN (173, 56.4%). Furthermore, 82 (27.5%) do not know why this condition occurs in diabetes. 76 (20.4%) of the participants have no idea about DN. The majority of the diabetic patients who are included in this study were found to have inadequate knowledge about nerves complications of diabetes and DN.

Our study shows that only 21 (7.6%) of diabetic patients are aware about the effects of the DM on their nerves. On the other hand, we found that 203 (54.6%) of participants have a low level of awareness about the disease.

DISCUSSION

DM is well known to be a common metabolic disease in Saudi Arabia. DN is a prevalent complication of T2DM with a major impact on the health of the affected patient. Early recognition of DN could prevent its major complications.

The aim of the study was to determine the level of awareness of DN among diabetic patients in Al-Ahsa region, Kingdom of Saudi Arabia.

Table 1: Demographical data (n=329) n (%)

Demographical data (N=329)	N (%)
Age	
36 (5.6)	<20
204 (80.8)	20–50
89 (13.6)	>50
Gender	
146 (44.3)	Male
183 (55.7)	Female
Marital status	
83 (32.7)	Single
231 (62.2)	Married
15 (5.1)	Divorced
Educational level	
15 (2.8)	Primary
53 (17.9)	Secondary
261 (79.3)	Academic

Table 2: Awareness

Knowledge level	Frequency (%)	Valid Percent	Cumulative Percent
Valid			
Not aware	203 (54.6)	54.6	100.0
Aware	105 (38.2)	38.2	75.0
Highly aware	21 (7.2)	7.2	32.5
Total	329 (100.0)	100.0	

In our study, we evaluated the level of awareness among male and female diabetic patients in Al-Ahsa region about DM neuropathy. Our finding is that there is no significant difference between males and females in the level of awareness of DN.

As can be seen, most of the participants in our study were in age group between 21 and 50 years. We attribute that this age group is the active age of the life. Usually, people at this age group are well educated and mindful about their health. However, no significant difference was found between the age groups in the level of awareness.

We find in our study that those participants who have academic educational levels had higher awareness level about the importance and the impact of the educational intervention to diabetic patients about DM neuropathy.

Furthermore, the study showed high discrepancy in the level of knowledge and awareness between those who have been educated about DN by healthcare providers and those who did not. As the Chi-square ($P = 0.001$) showed that patients who have been informed by the physicians have a higher level of awareness level than the others.

As the incidence of diabetic is very high in our population, healthcare providers have to encourage positive attitude toward the disease. We find in our study that the level of knowledge and awareness has to be increased among diabetic patients.

Unfortunately, the majority of diabetic patients in Al-Ahsa region were not appropriately aware about DN, and generally, they are not aware about diabetes complications. Diabetic patients in Saudi Arabia had poor attitude toward their disease. Their knowledge and awareness about diabetes and its complication is not adequate.

A study conducted in Medicine Department of Indus Medical College Tando Muhammad Khan, Pakistan, in February 2016–July 2016 showed that patients had very poor knowledge regarding DN.

Recently, the DN study group of the Korean Diabetes Association conducted a study investigating the awareness of DN on disease burden and quality of life in patients with T2DM showed there is lack of awareness of DN. Although if we compared our study which was done in selected region of Saudi Arabia and limited patients with other studies that conducted widely in different countries such as Pakistan (8.1%) and Korean (12.6%). We found that the knowledge score 7.2% is low.

Table 3: The responses of different statements related to the awareness of DN

Statement	Yes	I do not know	No
DM is a major cause of DN?	173 (56.4)	82 (27.5)	74 (16.1)
Foot ulcers (open sores) take a long time to develop?	83 (11.3)	201 (75.6)	45 (13.1)
Good circulation in the feet means that I will not get foot ulcers (open sores)?	39 (16.9)	276 (71.2)	14 (11.9)
If you have diabetes, has your doctor ever talked to you about your risk for developing DN?	69 (24.9)	207 (55.6)	53 (19.5)
Foot ulcers would be painful?	89 (24.6)	201 (63.1)	39 (12.3)
Do you know what the worst complications of DN?	109 (37.9)	121 (32.5)	99 (29.6)
Do you think there are effective ways to prevent neuropathy?	153 (50.0)	134 (36.0)	42 (24.0)
Do you think you will notice the symptoms of DN?	43 (14.1)	231 (66.8)	55 (19.1)

DN: Diabetic neuropathy, DM: Diabetes mellitus

According to our result, we suggest that diabetic patients have to be well educated about diabetes and all the possible consequences related to their disease. The level of their knowledge and awareness has to be appropriately increased. The responses of different statements related to the awareness of DN are shown in Table 3.

Implementing strategies that target all population “with specific emphasis for diabetics and prediabetic population” require fundamental social changes and may necessitate major public health initiatives.

CONCLUSION

DN is common and growing problem worldwide. The general knowledge level of awareness in Al-Ahsa population about DN and its risk factors are low. Individuals with diabetes/hypertension are not adequately informed regarding their increased risk for developing DN. To reduce the lack of awareness among Saudi diabetic population about this complication, there is a strong need for health and educational intervention programs about the DM as well as the necessity of screening and periodic followup programs. That will lead to increase the knowledge level and awareness about this disease and prevent its major complications.

REFERENCES

1. International Diabetes Federation. IDF Diabetes Atlas. 6th ed. Brussels, Belgium: International Diabetes Federation; 2013.
2. International Diabetes Federation. IDF Diabetes Atlas. 7th ed. Brussels, Belgium: International Diabetes Federation; 2015.
3. Giacco F, Brownlee M. Oxidative stress and diabetic complications. *Cir Res* 2010;107:1058-70.
4. Boulton AJ, Malik RA. Diabetic neuropathy. *Med Clin North Am* 1998;82:909-29.
5. Tesfaye S, Selvarajah D. Advances in the epidemiology, pathogenesis and management of diabetic peripheral neuropathy. *Diabetes Metab Res Rev* 2012;28 Suppl 1:8-14.
6. Zelman DC, Brandenburg NA, Gore M. Sleep impairment in patients with painful diabetic peripheral neuropathy. *Clin J Pain* 2006;22:681-5.
7. Levitt NS, Stansberry KB, Wychanck S, Vinik AI. Natural progression of autonomic neuropathy and autonomic function tests in a cohort of IDDM. *Diabetes Care* 1996;19:751-4.
8. Chong MS, Hester J. Diabetic painful neuropathy: Current and future treatment options. *Drugs* 2007;67:569-85.
9. Oh SJ. Clinical electromyography: Nerve conduction studies. In: *Nerve Conduction in Polyneuropathies*. Baltimore: Williams and Wilkins; 1993. p. 579-91.
10. Boulton AJ, Kirsner RS, Vileikyte L. Clinical practice. Neuropathic diabetic foot ulcers. *N Engl J Med* 2004;351:48-55.
11. Won JC, Kwon HS, Kim CH, Lee JH, Park TS, Ko KS, *et al.* Prevalence and clinical characteristics of diabetic peripheral neuropathy in hospital patients with Type 2 diabetes in Korea. *Diabet Med* 2012;29:e290-6.
12. Rathmann W, Ziegler D, Jahnke M, Haastert B, Cries FA. Mortality in diabetic patients with cardiovascular autonomic neuropathy. *Diabet Med* 1993;10:820-4.
13. Tahrani AA, Altaf QA, Piya MK, Barnett AH. Peripheral and autonomic neuropathy in South Asians and White Caucasians with Type 2 diabetes mellitus: Possible explanations for epidemiological differences. *J Diabetes Res* 2017;2017: Article ID 1273789, 10.

How to cite this article: Alhashim BN, Zaher A, Albujaays DS, Alhashim JN, Ali SI. Study of the Level of Awareness of Diabetic Neuropathy among Diabetic Patients in Al-Ahsa Region, Kingdom of Saudi Arabia: A Cross-sectional Study. *Int J Sci Stud* 2018;5(11):11-14.

Source of Support: Nil, **Conflict of Interest:** None declared.