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Research Article

AWARENESS OF DIABETIC NEUROPATHY IN RIYADH, SAUDI ARABIA

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Abstract:

Background: Diabetic neuropathy (DN) is the first long-term complication of DM. It can affect any part of the nervous system.

Objective: To assess the level of awareness among the general population including diabetic and non-diabetic groups regarding Diabetic neuropathy in Riyadh, Saudi Arabia.

Methods: A cross-sectional survey-based study collected data from Riyadh region, Saudi Arabia. Sociodemographic, diabetic history, source of information, and level of knowledge were the variables in the present study. A web site (raosoft) was used to calculate the sample size. All the statistical analysis of data was carried out using the software package for social sciences SPSS, version 26.0 by IBM. The current study is approved by the international review board (IRB) at Shaqra University, Saudi Arabia.

Results: A total of (759) responses were analysed. The median age was (28 IQR=23-35). All of a Saudi nationality. Only (10.3%) were diabetics. The median for total knowledge score was (3, IQR=0-6). The scores were divided into three categories; poor (0-3), moderate (4-6) and good (7-9) levels of knowledge. Half of the participants (50.2%) had poor level of knowledge about DN, (31.6%) had moderate level of knowledge, while only (18.2%) had a good level of knowledge.

Conclusion: The general knowledge about diabetic neuropathy among Saudi population in Riyadh was found to be unsatisfactory, with only (18.2%) had a good level of knowledge. Thus, more attention should be payed towards face-to-face education of the diabetics regarding diabetes complications and their warning signs.

Key words: Diabetes mellitus – Diabetic neuropathy – Riyadh – Saudi Arabia

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INTRODUCTION:

Diabetes mellitus is a major health concern with developing prevalence and different crippling complications [1]. Disregarding astonishing improvement in therapeutic sciences, diabetes mellitus is yet a serious long-lasting disease and is quickly expanding in all age gatherings or groups and both genders [1]. It impacts numerous functions of organs and body systems and is related with wide various and destroying complications [1].

Diabetic neuropathy (DN) is the first long-term complication of DM. It can affect any part of the nervous system. Clinicians should have a high index of suspicion and DN should be sought in all the patients suffering from DM. It is considered a diagnosis of exclusion. The diagnosis is made in diabetic patients when other causes have been excluded [2]. However, until now, there is no cure for DN. All the current programs are meant to slow the progression of the condition or prevent its complications [3].

Generally, DN starts peripherally affecting toes and distal parts of the foot in a “stocking and gloves” distribution. The most frightening consequence of DN is un-noticed ulceration which may result in an amputation. Usually, patients with severe DN or an advanced condition have no sensory function to feel objects that cause repetitive minor traumas, ulceration, or serious injuries. While patients normally present to the treating physician when they feel pain, injuries due to DN are usually painless causing delayed medical care and infection to the affected site [4].

One of the most important approaches to manage DN and its complications is to strive to make people more aware of the condition and its consequential risks. Several studies have been conducted to assess the level of awareness among diabetics regarding DN. In Saudi Arabia, a study has been conducted to assess the level of awareness among diabetics in regard to diabetic neuropathy [5]. The majority (54.6%) were not aware, and (38.2%) were aware, while only (7.2%) were highly aware about diabetic neuropathy [5]. Another study has compared the level of awareness in Saudi Arabia and Egypt [6]. The authors have concluded that lack of awareness is prevalent in both nationalities. However; it was found that Saudis were more aware about DN. [6].

The importance of assessing the knowledge among the general population of Saudi Arabia and diabetics particularly is the first step to guide the educational programs. Thus, the aim of our study is to assess the

level of awareness among the general population including diabetic and non-diabetic groups regarding Diabetic neuropathy in Riyadh, Saudi Arabia.

MATERIALS AND METHODS:**Study design:**

Survey-based cross-sectional study utilizing an online questionnaire to collect data about Sociodemographic, diabetic history, source of information, and level of knowledge.

Study area and population:

The study was carried out in Riyadh, Saudi Arabia. All the individuals residing Al-Riyadh city are eligible to participate in the study as long as they have access to internet and can fill the online form. Exclusion criteria include; non-Arabic speaking population, non-Saudis, illiterates, and those who do not consent to participate.

Sampling and data collection:

The Sample size was calculated using (Raosoft) website, with a margin of error of 5%, Confidence interval (95%), and response distribution of 50%. To make sure of the authenticity of the sample size the authors have used different websites including (Calculator.net), (SurveyMonkey) and (Creative Research System) websites, which gave the similar estimates of the sample size (385-400).

Statistical analysis:

The statistical package of social sciences (SPSS, version 26.00) was used to analyze the data. Median and Interquartile Range (IQR) were used to summarize the numerical not-normally distributed data, proportions for categorical data. The independent numerical variables were tested for significance using Mann-Whitney U and Kruskal-Wallis H tests, while the categorical outcomes tested using Chi-square and logistic regression. Alpha for significance was determined to be (0.05).

Ethical consideration:

All the collected data will be anonymous (no names nor ID) and will be used for research purposes only. All the participants will be asked to (click) the informed consent before starting the questions. This research was approved by the international review board (IRB) at Shaqra University, Saudi Arabia.

RESULTS:

A total of (759) responses were analysed. The median age was (28 IQR=23-35). All of a Saudi nationality. The demographic characteristics of our population is demonstrated in (Table 1). The participants were asked about their history of Diabetes Mellitus (DM). Only

(10.3%) were diabetics. Of which, (36.8%) had DM for less than five years, those who have had DM for (6-10) or (11-20) years represented (54.8%) distributed equally among the two groups, while only (8.4%) had for more than (20) years. Upon asking about their last results of hemoglobin A1c (HbA1C). More than one third (35.5%) did not know what was their last HbA1c level, (17.3%) had results equals to

or above (7.5%), and about one third indicated that the level of their HbA1c ranged from (6.6%) to (7.4%). However, there was only (15.5%) who had a HbA1c level of (6.5%) or less. Participants were also asked if they have a family history of DM. surprisingly, about two thirds (64.6%) had a positive family history of DM.

Table1: Sociodemographic characteristics of the population.

Variable	Frequency (%)
Gender	
Male	467 (61.5%)
Female	292 (38.5%)
Educational level	
Elementary	6 (0.8%)
Secondary	30 (4%)
High school	184 (24.2%)
University	486 (64%)
Higher education	53 (7%)
Monthly income	
Less than (5,000) SAR	307 (40.4%)
5,000 – 10,000	228 (30%)
More than (10,000)	224 (29.5%)

In the data collection, we included a total of nine questions exploring the knowledge of our participants about DN. The responses were highly variable (Table 2). The correct answers were given points (one point for each correct answer) and the total score was calculated to determine the level of knowledge according to the sum of correct answers out of nine. The median for total score was (3, IQR=0-6). However, the scores were divided into three categories; poor (0-3), moderate (4-6) and good (7-9) levels of knowledge. Half of the participants (50.2%) had poor level of knowledge about DN, (31.6%) had moderate level of knowledge, while only (18.2%) had a good level of knowledge. Total scores were further analysed looking for significant associations that can be attributed to or affecting the participants knowledge about DN. All the sociodemographic characteristics along with questions regarding history of DM were tested for significance. While gender, educational level, duration and family history of DM were not significantly associated with total score, the significant results are shown in (Table 3). As for numerical variable, age was significantly correlated with the total scores ($r = -0.09$, $P\text{-value} = 0.013$).

Table 2: participants responses to the knowledge questions.

Question	Yes	No	I do not know
Diabetes is the main cause of diabetic neuropathy	36.3%	4.6%	59.1%
Uncontrolled diabetes can cause diabetic neuropathy	49.3%	2.6%	48%
Diabetic neuropathy is painful and can be noticed	40.5%	14.8%	44.7%
Diabetic neuropathy is the first complication of diabetes	31%	12.3%	56.7%
Diabetic neuropathy can damage any nerve	38.1%	8.6%	53.3%
Diabetic neuropathy can cause foot ulcers	43.5%	4.4%	52.1%
There is a treatment for diabetic neuropathy	22.3%	10.6%	67.2%
Diabetic neuropathy can lead to amputation	47%	2.2%	50.8%
Diabetic neuropathy can cause death	38.1%	5%	56.9%

Table 3: Significant associations with the total scores of knowledges about diabetic neuropathy.

Variable	Number	Mean rank	Test statistics
Monthly income			
Less than (5,000)	307	403.57	Kruskal-Wallis H = 7.002 P-value = 0.030
5,000-10,000	228	354.44	
More than (10,000)	224	373.72	
Are you diagnosed with DM?			
Yes	78	477.62	Mann-Whitney U = 18945 P-value = < 0.000
No	681	368.82	
What was the results of the last (HbA1c)?			
(6.5%) or less	17	72.12	Kruskal-Wallis H = 12.967 P-value = 0.005
6.6% - 7.4%	35	63.51	
(7.5%) or more	19	50.11	
I do not know	39	43.69	

DISCUSSION:

Diabetes has many complications that are serious and can affect the patient's quality of life, interrupt the daily life, and cause amputation or even death. While the acute and apparent complications such as Diabetic Keto-Acidosis (DKA) can gain the patient attention and care immediately, nevertheless silent long term tremendous complications can be unnoticed and left without any care [7-8]. This can clearly be noticed in DN, it is considered as the first long term serious complication of DM [2]. As regard to the level of knowledge about diabetes and its complications among both physicians and patients, the literature has emphasized the great importance of education and screening for complications of diabetes. Furthermore, it was found that higher levels of knowledge were associated with better course and fewer complications from DM [9]. In the Middle East and North Africa (MENA), a research has mentioned the lack of awareness among both physicians and patients regarding DN, risk factors and the lack of proper care for diabetic foot [10]. This supports the unsatisfactory level of knowledge found in our study. Our results showed that only (18.2%) had a good level of knowledge about DN. This complication may come to the patient's mind as not important for its late and silent occurrence. The reported percentages vary greatly in the literature. On a study on a total of (100) diabetics, they were asked about the complications of DM. only one patient could identify DN as a serious complication of diabetes [11]. On another study, DN was mentioned by (29.2%), secondly after hypertension as a common complication of DM [12]

In a study that has been carried out in Al-Ahsa region, Saudi Arabia, investigating knowledge about DN [13]. The sample size was (329), all above (20) years of age. While there is a high variability in the characteristics between the population of the mentioned study and the current study in addition to that, our sample size being twice as more, there are similarities in the objectives of the two studies. However, (36.8%) of our population had diabetes for less than five, those who have had DM for (6-10) or (11-20) years, both had the same percentage of (27.4%). In Al-Hashim, et al., study [13], the results were roughly similar to ours. where (47%) had DM for less than five years, (28.4%) for (6-10 years) and (24.6%) had it for more than (11) years. As regard to the knowledge score (out of 25), the mean score was (7.1±3.4), which indicated a dramatically low level of knowledge among diabetic patients which should be expectedly higher than the general population. Our study has included diabetic and non-diabetic patients and the median for knowledge score was (3, IQR=0-6). Moreover, Al-Hashim, et al., study found that only (7.6%) knew the effect of DM on the nerves [13]. In another study aimed to compare the level of knowledge about DM and DM peripheral neuropathy between Saudis and Egyptians. Moderate level of knowledge was significantly higher among Saudis [14].

Many studies that aimed to measure the level of knowledge have generally recommend improving the overall awareness and spending more time on the patients' education. This rely on the whole medical team specially physicians and nurses. Where in an interventional study that has been carried out to study

the effect of nursing instructions on the patients' knowledge about peripheral neuropathy and diabetic foot [15]. In the quasi-experimental study, there was a significantly higher level of knowledge about diabetic neuropathy after the intervention in compare to before the intervention [15]. In another study, where (48%) had received information about diabetic foot. Higher level of education and who received information about foot care had higher knowledge [16]. Family physicians are in exposure to the diabetic and chronically ill patients, their knowledge about DN can play a central role in improving the overall knowledge [17].

CONCLUSION:

Diabetic neuropathy is considered the first long term complication of diabetes mellitus. Its silent course along with lack of education are the core factors that makes it prevalent and discovered in the late stages. The general knowledge about diabetic neuropathy among Saudi population in Riyadh was found to be unsatisfactory, with only (18.2%) had a good level of knowledge. Thus, more attention should be payed towards face-to-face education of the diabetics regarding diabetes complications and their warning signs.

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