A Cross-Sectional Study of Risk Factors and Preventive Measures among Patients Presenting to a Cardiac Center

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Abstract

Objective: Cardiovascular disease (CVD) is highly prevalent and more so in patients with diabetes mellitus (DM). Although many treatment advances have been made, the patient outcomes do not reflect the progress. With improved knowledge about the prevention of risk factors and the availability of educational material, the expectation was that patients would become more knowledgeable. **Materials and Methods:** The design was a cross-sectional study with patients presenting at a cardiac center in Jeddah, Saudi Arabia. **Results:** In total, 350 participants were included, both diabetic and nondiabetic patients. Just more than half of the sample (51%) was male, with a mean age of 49 years. There was a high incidence of metabolic syndrome components: 30% of the sample was hypertensive, 24% aware of being hyperlipidemic, and 40% overweight. From an educational perspective, 45% of the sample received no previous education regarding DM, 34% were unaware of the complications of diabetes, 41% reported that physicians did not provide appropriate education, and half of the sample indicated that the media did not provide appropriate education. This lack of education and patient-related factors resulted in 56% not following a diet, 52% did not control their diabetes to avoid complications, and 47% was not physically active. **Conclusion:** There is a significant gap in the public knowledge of diabetic risk factors, how to control diabetes and appropriate lifestyle changes. Information received from physicians or the media is below the patients' expectations. A combined strategy to raise awareness and improve knowledge between primary health care and media, starting at school age and continued through all admissions, is mandatory. Governmental support is required in all the different levels of education to decrease the burden due to CVD in Saudi Arabia.

Keywords: Cardiovascular disease, diabetes mellitus, education, knowledge

Introduction

Diabetes mellitus (DM) is a chronic metabolic disease and a serious global health concern.[1] DM affects more than 382 million people globally, with 90% diagnosed with type 2 DM.[2] In the last two decades, the prevalence of DM has increased as a consequence of unhealthy eating patterns, lack of exercise, and obesity.[2-4] The prevalence of type 2 DM is expected to increase from the current 240 million to 380 million by the year 2025.[3] In high-income countries, DM is considered a leading cause of cardiovascular disease (CVD), blindness, kidney failure, and lower-limb amputation.[2-4] The risk of cardiac disease in men with DM is twice as high compared to non-DM men and three times higher in women with DM as compared to women without DM.[5] The World Health Organization reported that Saudi Arabia

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has the second-highest rate of DM in the Middle East and is rated 7th highest globally. Maintaining a blood glucose level, cholesterol level, and blood pressure close to normal with a healthy lifestyle can prevent complications due to DM and CVD.[2] This study aimed to identify and assess the knowledge of DM and non-DM participants regarding a healthy lifestyle, physical activity, and nutritional status.

MATERIALS AND METHODS

The present study was a cross-sectional study with patients presenting at the Cardiac Center at the Ministry of National Guard-Health Affairs, Jeddah, Saudi Arabia. The study included patients diagnosed with and without DM. The study design was a cross-sectional survey, using a convenient sampling technique, over a period of 1-year. The study was approved by the Institutional Review Board at King Abdullah International Medical Research Center number 1119/17 dated 24/8/2017. The inclusion criteria included adults (18 years older), both genders and attending the cardiac clinic. Drug-induced DM was excluded from the study. Data were gathered with a questionnaire from a sample of 350 patients. The questionnaire was developed by three of the authors and assessed the samples knowledge-related diabetic complications, appropriate diet, sociodemographic characteristics, awareness level, physical activity and other associated risk factors, the dietary habits and compliance, and possible complications. Once the questionnaire was completed, the patient received one-on-one education by three of the authors focusing on the identified knowledge deficits.

Statistical analysis

Statistical analysis was performed using the Student's *t*-test. For the quantitative data, the mean and standard deviation is presented for normally distributed data and the median and interquartile range for skewed data. For the qualitative data, percentage and frequency are used.

RESULTS

The sample realized as 350 with 51% (*n* = 179) patients with DM (DM subgroup) and 49% patients without DM (non-DM subgroup). Of the combined sample, 51% were male and the mean age 49 ± 7.4 years.

Risk factors

There was a high prevalence of the cardiac disease in the DM subgroup with 49% with a diagnosed cardiac disease or admitted due to ischemic heart disease or heart failure. In terms of hypertension, 31% of the DM subgroup and 30% of non-DM subgroup were hypertensive. A smaller proportion (24%) of the DM subgroup had a high cholesterol level compared to 14% in the non-DM subgroup [Figure 1]. Obesity was also prevalent; overall, 40% of the combined sample of which 23% was of the DM subgroup and 17% in the non-DM subgroup [Figure 2].

Diabetes mellitus related level of knowledge

Just less than half (41%) of the combined sample reported that their physician did not provide appropriate formal education.
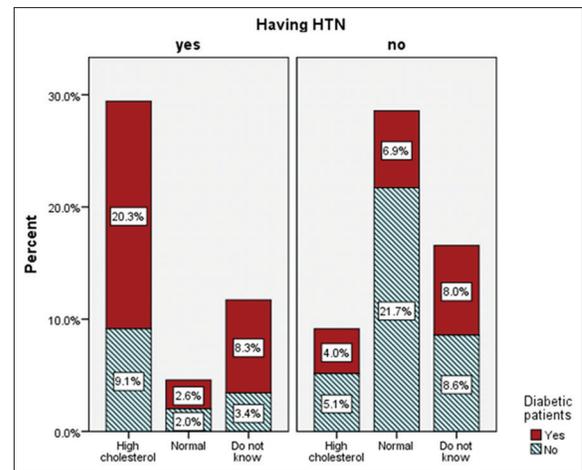

Figure 1: Represents the percentages of hypertension and high cholesterol among diabetes mellitus and nondiabetes mellitus

For the DM subgroup, 45% reported receiving no previous education regarding DM complications, including the cardiac symptoms. Despite the importance of knowing about diabetic complications, 34% was unaware of any such complication with the rest of the sample obtaining the knowledge they had through the media.

The non-DM subgroup also required health education as 56% had prediabetic health risks such as obesity. The non-DM subgroup stated that they did not receive any health education about diabetes, 39% indicated that the physician did not provide enough information about the disease, and 28% are unaware of diabetes-related complications to encourage them to adhere to a healthy lifestyle. The lack of awareness of the cardiovascular complications was a concern as 52% stated that CVD was not a probable outcome of uncontrolled DM. It is noteworthy that 73% of the non-DM was aware of diabetic complications, but 50% did not know that CVD is a major complication. The social media contribution to their health-related knowledge was below the expectation as half of both subgroups indicated that the media is not providing appropriate education regarding diabetes or its complications.

Compliance

Regarding compliance with their diabetic management, for the DM subgroup, 56% were not following a DM diet, 47% was physically inactive, and in 52%, the blood glucose levels were not within the recommended range to avoid diabetic complications. It is important that a diabetic patient is aware of the food content of every meal; however, 70% reported that they do not read food labels. In addition, 39% of the DM subgroup reported a weekly consumption of fast food, olive oil (71%), honey (58%), and black seeds (49%) as compared to the non-DM subgroup reporting the consumption of olive oil (23%), honey (44%), and black seeds (67%). The non-DM subgroup was physically more active and a smaller proportion (35%) reported not being physically active.
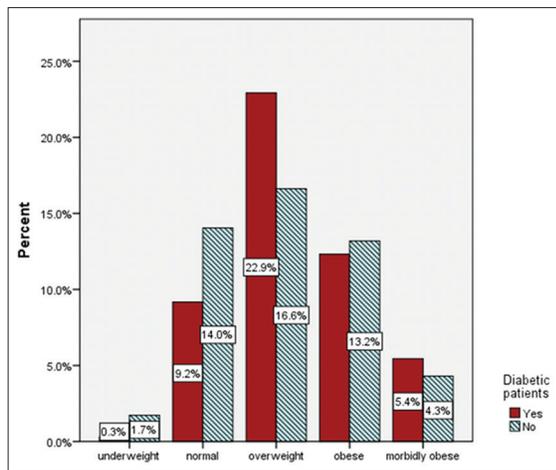
Figure 2: Sample classification according to body mass index

Figure 3: Percentages of diabetes mellitus and nondiabetes mellitus who need nutrition and prevention education

Blood glucose control

The majority of the sample was not aware of the importance of measuring their blood glucose levels during the day, which is concerning as only 30% of DM subgroup was measuring their blood glucose twice daily.

Patient needs

Just less than half (41%) of the DM subgroup indicated the need to be educated regarding the nutritional management of DM, with 38% requesting to be educated in terms of diabetic control and the prevention of complications. In comparison, 40% of the non-DM subgroup stated that they need education in terms of the nutritional management of DM and 33% reported the need to know how to prevent DM [Figure 3]. For the combined sample, the majority (93%) reported that they benefited from the interview and the individual education and was interested to know more.

DISCUSSION

For both subgroups, the prevalence of overweight and obesity was high. A high percentage of the non-DM subgroup was overweight or obese and preventive measures should be emphasized as obesity is a prediabetic risk factor.[6] Similarly, hypertension and high cholesterol levels were frequent but higher in the DM subgroup, highlighting the need for in-depth health education regarding the relationship between DM and CVD. The study provides evidence of insufficient health education in the tertiary care setting, as half of the DM subgroup never received any health education. The role of primary health care and general practitioners is pivotal in educating the patient about diabetes from the first time they attend a health-care center. In addition, from the tertiary center perspective, the media should be more pro-active in patient education as their current role is suboptimal.[7] The importance of regular glucose level testing, checking food labels, and a reduction in fast-food consumption should be emphasized and can be done through a phone interview, the media, and nursing practitioners.[8] The high percentage consuming olive oil is to
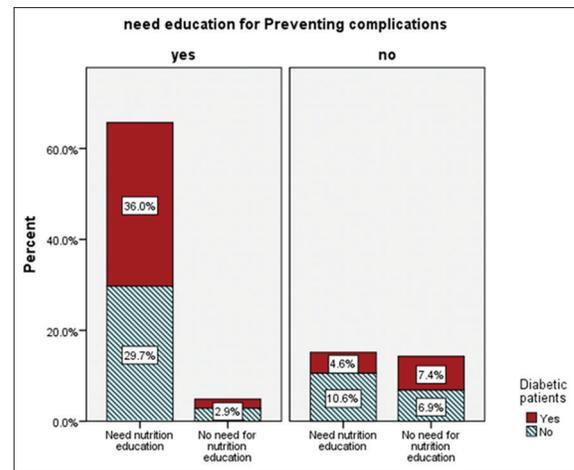
be encouraged; however, the effect of honey and black seeds taken on a daily basis have to be investigated in a controlled study to determine the effect on the blood glucose level.[9]

CVD should be emphasized for both patients with DM and pre-DM patients as it underrated as a complication. To stimulate physical activities, more walking spaces must be developed to reduce the proportion of physically inactive persons. Walking as a lifestyle choice should be encouraged by the primary school years.[10]

A positive outcome of the study is the high level of satisfaction of the interview and individual education session. The response mandates additional studies to completely understand how to support DM and prediabetic patients to prevent the inevitable complications of DM.[11] Social media should be used efficiently to maximize the short time available for health workers to interact with their patients.[12] A study done in Tabuk City, Saudi Arabia, indicated that the body mass index, sugar consumption, and skipping breakfast in DM patients was higher than the control group (non-DM).[13] Another study reported 70% of DM patients to be obese, 11% were hypertensive, and 18.5% were prehypertensive, highlighting the importance managing lifestyle choices to reduce the prevalence of these comorbidities,[9] and similar findings were noted in Najran, Saudi Arabia.[14] In a pilot study with DM patients, <5% reported that they received good education about diabetes, 41% were sedentary, 24% were unaware of the complications of diabetes, and 40% were unaware that CVD or retinopathy are complications of DM.[15] A major objective for Saudi Arabia and many other countries is to encourage a fulfilling and healthy lifestyle and work toward improving and developing health education programs for the comprehensive dissemination of health information. The knowledge deficit is global, including developing countries such Gambia as well as developed countries. A review done in the United Kingdom reported that illiteracy and lack of knowledge pose a great challenge to effective health education.[16,17]

A limitation acknowledged for the study was the small sample size.

Conclusion

The current study highlights the deficit in knowledge related to several important aspects of DM, including the risk factors, complications, self-management, and nutrition in diabetic and nondiabetic patients. The risk factors were noticeably high in both groups. Attention to and improvement of educational programs in the community is crucial for long-term positive effects and reducing the health burden in Saudi Arabia due to DM and CVD.

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Conflicts of interest

There are no conflicts of interest.

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