THE CHALLENGE OF PROPER GLYCAEMIC CONTROL AMONG PATIENTS WITH TYPE 2 DIABETES IN BANGLADESH

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ABSTRACT

Introduction: Despite the numerous advances achieved in diabetes control and evaluation, the management of this complex disease remains challenging. This study was conducted with the aim of determining the level of glycaemic control among adult patients with type 2 Diabetes mellitus.

Method: The cross-sectional study was conducted in the diabetes care centers of the outpatient departments in Bangladesh. Adult patients with at least 2 years documented history of type 2 diabetes mellitus (T2DM) were recruited and data regarding the demographics, treatment they received and the level of glycaemic control was assessed.

Result: A total of 5140 diabetic patients fulfilling the inclusions criteria were recruited for the study. 9.90% of the patients were below 40 years of age and the majority (64.05%) of the respondents were from urban communities. Based on HbA1c levels, only 18.8% of the patients had good glycaemic control. Gender, educational level and the income seem to have a relationship with the level of glycaemic control.

Conclusion: Despite the medical advances in the management of diabetes, the glycaemic control of the majority (81.2%) of the T2DM patients are still very poor.

Keywords: Type 2 diabetes, glycaemic control, Bangladesh

INTRODUCTION

According to International Diabetes Federation (IDF), the prevalence of diabetes is expected to rise from 382 million in 2013 to 592 million by 2035 throughout the world and the majority (80%) of them will live in low and middle-income countries. Diabetes has become the seventh leading burden of diseases in South Asian countries putting an enormous pressure on fragile health systems in low-economic countries. In the South Asian region, Bangladesh has the second largest number of adults with diabetes (7.1 million adults, 8.2% of the adult population). In the year 2010, 3.4 million people died of the consequences diabetes worldwide.

The studies have shown that the improved glycemic control in people with diabetes can reduce the risk of long-term complications. The Diabetes Control and Complications Trial (DCCT) and the United Kingdom Prospective Diabetes Study (UKPDS) have provided evidence for the benefits of tight and sustained glycemic control among type 1 and 2 diabetic patients. All these studies have emphasized the need of maintaining the level of HbA1c of 6.5-7% for prevention of diabetes-related complications. Despite the numerous advances achieved in diagnosis, evaluation and management of this complex disease, achieving proper glycemic control remains challenging. The epidemiological data suggest that in the majority of patients, the glycemic control is poor. Even in the developed countries with strong health care systems, the status of glycemic control is not very good and only 37.0% of adults with diabetes had HbA1c levels at the ADA goal of less than 7.0% according to the figures in 1999-2000.

A study done in Pakistan in 2007 showed that only 51.4% of T2DM patients had HbA1c within the control level (>7%) and this figure
was 48.5% in 2005 (7). Edson et al. found that overall prevalence of inadequate glycemic control in Venezuela was 76% (8), which was greater than previous estimates from other studies including type 1 and 2 diabetic patients where it is 40% in Germany (9), 51% in Denmark (10) and 61% in Kenya (11). In African Seychelles, less than a quarter of all the patients with diabetes had proper glycaemic control (12) and in a study done by Tel Aviv in Israel, this figure was reported as 41.6% (12). Studies in India has shown that more than half of the patients with diabetes had poor glycemic control (HbA1C >2% points above the upper limit of normal and FBG >139 mg/dl) (14).

When the gravity and the cost of diabetes complications are considered, poor glycemc control among patients with diabetes is a concern. The previous study done in 2008 by Latif et al. has demonstrated that the glycaemic control among patients with diabetes in Bangladesh is not that different. This study demonstrated that 76.9% of the patients failed to achieve the recommended glycaemic target of <7% (13). This study was conducted with the objective of gathering information regarding the degree of glycaemic control among adult type 2 diabetic patients with current practice.

**METHOD**

This cross-sectional study was conducted among the adult type 2 diabetes at the out-patient departments of Bangladesh and 5 other centres of Bangladesh Diabetes Somity (BADAS) in Dhaka, Bangladesh from January 2013 to December 2013 Ethical approval from the ethical approval committee of BADAS was obtained prior to the commencement of the study. T2DM patients who were having at least 2 years of records were selected to participate the study. The patients who fulfilled the inclusion criteria and who gave written informed consent were recruited. A semi-structured questionnaire containing items to elicit socio-demographic information and relevant information about co-morbid illnesses was used. Height, weight, blood pressure

| Table 1: Socio demography of the respondents (n=5140) |
|-----------------------------------------------------|
| **Age**                                             |
| <40 years                                           | 510 (9.90) |
| 40-49 years                                         | 1698 (32.99)|
| 50-59 years                                         | 1724 (33.54)|
| 60-69 years                                         | 1066 (20.72)|
| ≥70 years                                           | 145 (2.83) |
| **Sex**                                             |
| Male                                                | 2645 (51.46) |
| Female                                              | 2495 (48.54) |
| **Residence**                                       |
| Rural                                               | 1848 (35.95) |
| Urban                                               | 3292 (64.05) |

| Table 2: Distribution of the respondents by level of education and occupation (n=5140) |
|---------------------------------------------------------------------------------------|
| **Year of schooling**                                                                |
| 5                                                                                    | 1895 (27.12) |
| 6-12                                                                                 | 2954 (57.47)|
| ≥13                                                                                  | 291 (15.41) |
| **Occupation**                                                                       |
| Student                                                                              | 16 (0.31) |
| House wife                                                                           | 2030 (39.49)|
| Farmer                                                                               | 1850 (35.41)|
| Service holder                                                                       | 956 (18.59) |
| Retired                                                                              | 112 (2.19) |
| Others                                                                               | 76 (1.48) |
| **Habit of smoking**                                                                 |
| Smoker                                                                                | 1081 (19.09) |
| Non-smoker                                                                           | 3793 (73.79) |
| Quitted                                                                              | 266 (5.12) |
| **Habit of smokeless tobacco consumption**                                           |
| Consumer                                                                             | 1496 (29.01) |
| Non-consumer                                                                         | 3392 (65.99) |
| Quitted                                                                              | 252 (5.00) |
| **Habit of alcohol consumption**                                                     |
| Consumer                                                                             | 98 (1.9) |
| Non-consumer                                                                         | 5042 (98.1) |
| Quitted                                                                              | 08 (0.16) |

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The majority of the patients selected were between 40 to 60 years of age (66.53%), were males (51.46%) and were from urban background (64.05%). The details of demographic characteristics of the subjects are shown in Table 1. 57.47% of the subjects have studied up to college level reflecting a considerable level of education among patients with diabetes in Bangladesh (Table 2). The majority of the females were housewives, which constitute about 43% of the study population (Table 2). Among the study subjects, around 19% were smokers, 27.1% were tobacco consumers, and 1.3% were alcohol users (Table 2).

About 5% of the patients were only on medical nutrition therapy (MNT), 43% of the patients were on oral medication and 52% of the patients were on insulin therapy in combination with oral medication (Table 3). Irrespective of the duration of diabetes, only about 18.8% of the patients had desired glycaemic control (Table 4, 5). The level of glycaemic control was not related the duration of diabetes (Table 5). However, the educational status and the patient’s income seem to have relation to the level of glycaemic control and women seem to have a better glycaemic control compared to men (Table 6).

### RESULTS

The majority of the patients selected were between 40 to 60 years of age (66.53%), were males (51.46%) and were from urban background (64.05%). The details of demographic characteristics of the subjects are shown in Table 1. 57.47% of the subjects have studied up to college level reflecting a considerable level of education among patients with diabetes in Bangladesh (Table 2). The majority of the females were housewives, which constitute about 43% of the study population (Table 2). Among the study subjects, around 19% were smokers, 27.1% were tobacco consumers, and 1.3% were alcohol users (Table 2).

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had HbA1c levels at the ADA goal and in the USA, only 37.0% of adults.

In a given community, various factors could influence the level of glycaemic control in patients with diabetes. Gender of the patient seems to have a significant relationship with the levels glycaemic control. A Finish study has demonstrated that male patients had better glycemic control than female patients (18). Apart from soci-economic factors such as educational level and financial status, inadequate knowledge about diabetes has been reported to negatively affect behavior and self-care among diabetes patients (20). In contrast to the Finish study, the level of glycemic control is better in females compared to males. The glycemic control among educated and among patients with a higher income has been better. This probably could be due to the better accessibility and availability of health care for these categories of patients. According to available data, the majority diabetic patients do not receive sufficient diabetes education (21) and this probably in the main reason for the poor glycemic control among patients with diabetes. These findings highlight the importance of the quality of the diabetes care and importance of diabetes education provided to these patients.

CONCLUSIONS

The patients in Bangladesh has the accessibility to all types of medication including insulin and the modern drugs such as DPP4 inhibitors and GLP1 analogues. Despite the availability of latest management tools and medication for the management of diabetes, only about 18% of the T2DM patients in Bangladesh had desired glycaemic control (HbA1C ≥ 7%). Patient’s gender, educational status and the patient’s income seem to have an association with the levels of glycemic control.

The benefits of tight glycaemic control are well known (5). Despite of clear evidence, many patients fails to reach an optimal glycemic target (17, 18). Even with the medical advances and availability of modern drugs and health care facsilies, managing diabetes has been a challenge throughout the world. It has been even more difficult in developing countries and almost similar findings have been reported in Bangladesh in previous studies (15). In neighboring India, the situation is little better than Bangladesh and Raheja et al. showed that more than half of the diabetic patients in India had poor glycemic control (16). Even in countries with highly educated people with strong health care systems, the level of glycemic control is not that different and in the USA, only 37.0% of adults had HbA1c levels at the ADA goal of less than 7.0% (19).

better glycaemic control, proper glycaemic control has been a challenge and has been a universal problem.

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