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Glycemic Control and its Associated Factors Among Diabetes Mellitus Patients at Ayder Comprehensive Specialized Hospital, Mekelle-Ethiopia

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Extended Abstract

Abstract

Globally, diabetes has killed 4.6 million people in 2013 alone and more than 77% of morbidity and 88% of mortality occur in low- and middle-income countries. Glycemic Control in diabetes patients is an important issue in minimizing diabetes related complications and deaths. But in Sub-Saharan Africa it was limited because of insufficient healthcare systems; scarcity of training in diagnosis and treatment. Therefore, the finding of this study will fill the gap on glycemic control and its factors. The global dominance of diabetes among adults over 18 years aged has risen from 4.7% in 1980 to eight .5% in 2014. Diabetes prevalence has been increasing sooner in middle- and low-income countries. Diabetes may be a major explanation for impaired vision, renal failure, heart attacks, stroke and lower limb amputation. In 2016, an assessed 1.6 million deaths were directly caused by diabetes. Another 2.2 million deaths were due to high blood sugar or Diabetes in 2012. Almost half all deaths due to high blood sugar or Diabetes occur before the age of 70 years. WHO estimates that diabetes was the seventh prominent explanation for death in 2018. The pervasiveness of diabetes for all age-groups worldwide was assessed to be 3% out of 3000 and 5.2% of each 2080.

Different factors plays a task in treating diabetes, regular and successful treatment decrease the danger of diabetes complications. Type 1 diabetes treatment may be a daily task. Treatment requires a strict regime that has carefully calculated diet, planned physical activity, multiple daily insulin injections and residential blood sugar testing variety of times per day. Type 2 diabetes eventually need insulin, as their capability to supply their own insulin from pancreatic beta cells declines progressively. Insulin can't be taken as a tablet because it might be weakened during digestion a bit like the protein in food. It must be injected it to urge into your blood stream. All insulin's come dissolved or suspended in solutions. the quality and most often used strength within the us today is U-100, which suggests it's 100 units of insulin per millilitre of fluid, though U-500 insulin is accessible for patients who are extremely insulin resistant.

Glycemic control remains a fragile balancing act. The diabetic patient is tasked with maintaining euglycemic blood sugar levels, a goal requiring education, decision strategies, volitional control, and therefore the wisdom to avoid hyper- and hypoglycemia, with the latter defined as plasma glucose but ~60 mg/dl. Glucose levels must be controlled continuously and without holidays. Failure to take care of euglycemia results from biological factors and psychosocial factors including overmedication and/or inappropriate choices regarding food, drink, and, in certain cases, exercise.

Diabetic patients, especially those treated with insulin, are in danger for developing hypoglycemia. Treatment, even with oral agents like sulfonylureas, increases this risk. Asymptomatic episodes of hypoglycemia may constitute up to 10% of a 24-h

period in diabetic patients. Individuals with type 1 diabetes average 43 symptomatic episodes annually; insulin-treated individuals with type 2 diabetes average 16 episodes. As for severe hypoglycemic episodes, patients with type 1 diabetes experience up to 2 episodes annually, whereas patients with type 2 diabetes experience about one episode over 5 years. the danger increases with a history of hypoglycemia and an increased number of years of insulin treatment.

Severe hypoglycemic episodes often occur during sleep, when the intensity and recognizability of counter regulatory responses tend to be diminished, thereby depriving individuals of the adequate stimulus to counteract hypoglycemia. These episodes, termed nocturnal hypoglycemia (NH), may end in part from insufficient food intake and/or inappropriate insulin dosage the previous evening. Asymptomatic NH may be a relatively common phenomenon affecting up to 50% of adults and 78% of youngsters and lasting as long as several hours. Moreover, NH is suspected to contribute to the “dead-in-bed syndrome” that results in the mortality of 6% of type 1 diabetic individuals below the age of 40 years.

In addition to NH, individuals can also fail to acknowledge hypoglycemic episodes during the day. Such desensitization is thanks to decrease neuroendocrine responses to hypoglycemia that dampen symptomatic responses. Men are more susceptible to desensitization, whereas women inherently exhibit decreased counter regulatory responses to hypoglycemia. Thus, in both sexes, the warning signs and symptoms of hypoglycemia are typically not exhibited until blood sugar drops to dangerously low levels. Even two episodes of moderate hypoglycemia are sufficient to decrease counter regulatory hormonal responses to hypoglycemia.

Methods

Institution based comparative (glucometer users and non-users) cross-sectional study was conducted from March to April, 2017. Data was collected by structured questionnaire and anthropometric measurements were taken using standardized techniques and calibrated equipment. Glycated Hemoglobin A1c and biochemical profiles were determined using Huma Meter A1c and ABX PENTRA 400 analyzers respectively. Independent t-test, binary and multiple logistic regression analysis were used. A P-value <0.05 was considered as statistically significance.

Results

A total of 336 study participants were enrolled in this study. Overall, 61.9% of the study participants had poor glycemic control. The poor glycemic control was significantly higher in glucometer non-users 71.4% compared to glucometer users 52.4% ($P < 0.001$). The mean HgA1c level was significantly higher among glucometer non users than users (8.4 ± 2.24 vs. 7.68 ±1.95) [p-value<0.001]. FBS was higher among glucometer non-users (176.2 ± 71.7) than users (152.3 ± 65.4) [p = 0.002].

Conclusion

Income, the number of visits, high-triglyceride, high low-density lipoprotein and non-glucometer use were significantly associated with the poor glycemic control.