

EDITORIAL

A revolution in Diabetes diagnosis and therapy

Editorial by Orwa JA, PhD.
Editor-in-Chief

The condition now known as diabetes has been documented since the dawn of time by scientists and physicians. In 1552 BC, Hesy-Ra, an Egyptian physician, documented frequent urination as a symptom of a mysterious disease. At the same time, Ancient Hindu writings noted that ants are attracted to the urine of people with a mysterious disease. The Egyptians recognized an ailment suspected to be diabetes approximately 1550 BC, and 500 BC saw the first descriptions of sugar in the urine and its occurrence in obese individuals.

Greek physician Apollonius of Memphis is credited with coining the term "diabetes," naming the disorder with its first symptom: the excessive passing of urine through the body's system in 250BC. Mellitus, the Latin word for honey, was added to the term diabetes. Physicians began to gain a better understanding about diabetes in 150AD and in 164AD Greek physician, Galen of Pergamum, diagnosed diabetes as a kidney ailment. Up to the 11th century, since the urine of people with diabetes was thought to be sweet tasting, diagnosis was often made by "water tasters" who drank the urine of those suspected of having diabetes. In 1953, tablets for testing urine glucose became widely available, and urine test strips appeared over the next few years.

In the early years of the 20th century, medical professionals took the first steps toward discovering a cause and treatment mode for diabetes. In 1923, Eli Lilly and Company began commercial production of insulin. In 1926, Edward Albert Sharpey-Schafer announced that the pancreas of a patient with diabetes was unable to produce what he termed "insulin," a chemical the body uses to break down sugar. Thus, excess sugar ended up in the urine. In the decades that followed, manufacturers developed a variety of slower-acting insulins, the first being Protamine insulin introduced by Novo Nordisk in 1936. In 1996, the drug Acarbose, brand name Precose (Bayer Corporation) became available in the U.S.A. Acarbose is an alpha-glucosidase inhibitor that slows digestion of some carbohydrates. Lispro (a lysine-proline analog) was introduced by Eli Lilly and Company as the world's fastest acting insulin.

Although insulin injection began to successfully combat diabetes, some cases were unresponsive to this form of treatment. Harold Himsworth finally distinguished between the two types of diabetes in 1936, according to writings published by his son Richard in *Diabetic Medicine*. He

defined them as "insulin-sensitive" and "insulin-insensitive." Today, these classifications are commonly referred to as "type 1" and "type 2" diabetes.

In 1959 using radioimmunoassay technology, Solomon Berson, MD and Rosalyn Yalow, PhD developed a method for measuring insulin in the blood. They noticed that some people with diabetes produce their own insulin, and they identified "insulin-dependent" (type 1) and "non-insulin-dependent" (type 2) diabetes. In 1971 insulin receptors were discovered on cell membranes. This discovery raised the possibility that missing or defective insulin receptors may prevent glucose from entering the cells, thus contributing to the insulin resistance of type 2 diabetes.

In 1913 Allen's book - *Studies Concerning Glycosuria and Diabetes*, stimulated a revolution in diabetes therapy. Between 1910 and 1920, Allen and Joslin were considered the two leading diabetes specialists in the United States. Joslin believed that diabetes was "the best of the chronic diseases" because it was "clean, seldom unsightly, not contagious, often painless and susceptible to treatment." In 1916, Allen promoted a strict diet regimen, which was soon widely adopted. Allen believed that the diabetic's body could not use food, so he limited the amount of food allowed to patients. Patients were admitted to the hospital and given only whiskey mixed with black coffee (or clear soup for teetotalers) every two hours from 7am to 7pm. This diet was followed until there was no sign of sugar in the urine, usually 5 days or less. A strict diet followed. Outcomes were better than ever seen before for those with type 2 diabetes. Unfortunately, those patients with type 1 diabetes commonly died during the treatment, likely from starvation. A few young people did survive and became the first insulin users. In 1919, Allen published *Total Dietary Regulation in the Treatment of Diabetes*, with exhaustive case records and observations of 76 of his 100 diabetes patients.

The life expectancy for people with diabetes in 2004 was still lower than that for the general population by about 15 years. In 2014, 26 million Americans had diabetes and 1 in 3 of them was unaware. Another 79 million Americans were categorized as "pre-diabetic" and were at risk of developing diabetes in the next ten years if they failed to make appropriate lifestyle changes. Diabetes that was considered a disease of the affluent has now infiltrated the African region affecting the poor and wealthy in equal proportions. The World Health Organization (WHO) estimates that the prevalence of diabetes in Kenya is at 3.3% and predicts a

rise to 4.5% by 2025. However, two-thirds of diabetics may be undiagnosed. So is it a revolution or an evolution in diabetes therapy?

Bibliography

1. <https://www.defeatdiabetes.org/diabetes-history/> Posted on January 22, 2014 by Dawn Swidorski
2. <http://www.britannica.com/eb/article?tocId=45578>
3. <http://www.cygn.com/overview/history.html>
4. <http://diabetes.about.com/library/bNIHdiabetesoverview8.htm>
5. <http://inventors.about.com/gi/dynamic/offsite.htm?site=http://web.mit.edu/invent/iow/free.html>
6. <http://diabetes-communication.org/wordpress/wp-content/uploads/2012/09/Kenya-National-Diabetes-Strategy-2010-2015-Complete.pdf>. Republic of Kenya. Ministry of public health and sanitation. Kenya National Diabetes Strategy. First Edition. 2010.
7. Tiffany L.E. Jones. Diabetes Mellitus: the increasing burden of disease in Kenya. South Sudan Medical Journal Vol 6(3) 2013.

Knowledge on Diabetes Mellitus and its Management Strategies among Diabetic Outpatients in a Tertiary Referral Hospital in Kenya

Nyamu D.G.^{1,*}, Juma R^{2,3}, Mwangangi E.M¹, Maru S.M¹, Tele A. K⁴, Gitonga I.⁵

¹ University of Nairobi, College of Health sciences, Department of Pharmaceutics & Pharmacy Practice, P.O Box 19676-00202, Nairobi, Kenya, email: gnyamu@gmail.com.

² Kenya Medical Research Institute, Center for Clinical Research, P.O. Box 19463-00202, Nairobi-Kenya.

³ Mt. Kenya University, School of Health sciences, P.O. Box 342-00100, Thika, Kenya

⁴ Kenyatta University, Department of Statistics & Actuarial sciences, P.O Box 43844-00100, Nairobi, Kenya, email: telekim01@gmail.com.

⁵ University of Nairobi, School of Public Health, Department of Epidemiology & Biostatistics, P.O Box 19676-00202, Nairobi, Kenya, email: gitongaisaiah0@gmail.com.

^β Post humus.

*Corresponding author

Abstract

Background: Good knowledge about diabetes and its management enhances the ability of patients to cope and adjust to their illness.

Objectives: To determine the knowledge on diabetes mellitus and its management among diabetic outpatients at Kenyatta National Hospital, Diabetic Clinic.

Methodology: This was a cross-sectional study involving 105 consenting diabetic outpatients, aged ≥ 18 years. Consecutive sampling was used to collect data using pre-designed semi structured interviewer administered questionnaires. Patients' knowledge on diabetes mellitus including cause, symptoms, complications, medications, dietary control, importance of exercises and diabetes affiliate organizations was collected and analysed using IBM statistical package for social sciences version 21. Chi square tests were used to compute associations between participants' sociodemographics and outcome variables at $p \leq 0.05$.

Results: The ratio of males to females was approximately 1:1. The mean age of the participants and duration of diabetes was 41.0 ± 16.0 and 6.0 ± 5.0 years, respectively. Knowledge on causes, signs and symptoms of diabetes

mellitus was statistically significantly associated with the education level ($p=0.0001$) and was more common among males ($p=0.01$). Knowledge on dietary control ($p=0.02$), exercise ($p=0.04$) and complications ($p=0.05$) was more common among males and the more educated. Irrespective of sociodemographic variables ($p>0.05$), only 33.3% of the patients knew their medication and dosing schedules in relation to meals. A large proportion (90%) of the patients was unaware of the role of diabetes affiliate organizations.

Conclusion: Knowledge on diabetes among diabetic outpatients varies with level of education and gender. More health education is, however, advocated to diabetic patients in order to increase their knowledge on antidiabetic medication and diabetes affiliate organizations. Future work should, however, be carried out to correlate the patients' level of knowledge and long term glycaemic control.

Keywords: Diabetes mellitus, patient knowledge, control measures, antidiabetic medication, diabetic affiliate organizations.

Introduction

Globally, diabetes mellitus (DM) is emerging as one of the