

## NURSES UNDERSTANDING ABOUT DIABETES IN A NIGERIAN TERTIARY HOSPITAL

Unadike B. C<sup>1</sup>, Etukumana E. A<sup>2</sup>

### ABSTRACT

**Objective:** Diabetes mellitus is a growing public health problem in the world. Health education by health workers is a key factor in the prevention of this chronic disease. The objective of the study was to determine nurses understanding of diabetes mellitus.

**Methodology:** This was a cross-sectional descriptive study carried out at the University of Uyo Teaching Hospital between June to December, 2008. Registered nurses were questioned about the clinical features, diagnosis, complications and management of diabetes mellitus. The results were analyzed using appropriate statistical method.

**Results:** A total of 113 nurses completed the questionnaire. Majority were below 50 years and were ward nurses. About 86.7% correctly identified the definition of diabetes mellitus ( $p < 0.01$ ) and 26.7% identified  $<7\text{mmol/l}$  as the fasting plasma glucose diagnostic cut off for DM. Ninety seven percent agreed that DM is a chronic disease ( $p < 0.01$ ). Polyuria (63.7%) and polydypsia (90.3%) were the commonest clinical features of DM identified.

Insulin therapy was the most common form of management identified by 67.9% of the subjects. Majority (83.2%) agreed that weight reduction is useful. About two-thirds (67.2%) identified two oral hypoglycaemic drugs while 25(22.1%) could not identify any type of insulin. Most subjects (94.7%) could correctly identify treatment for hypoglycaemia, with 7.1% of the nurses saying that insulin can be used to treat hypoglycaemic coma. The eye (82.3%) was the most common organ identified as being complicated with DM. Less than half of the nurses could identify the symptoms of diabetic ketoacidosis while about half (50.9%) of the nurses could identify at least one symptom of diabetic ketoacidosis.

**Conclusion:** Nurses' knowledge of diabetes mellitus in Uyo is adequate; however, there are deficits in certain aspects of diabetes management. Organization of regular diabetes educational programmes for nurses will improve these deficiencies in knowledge

**KEY WORDS:** Diabetes, Nurses, Knowledge, Awareness.

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1. Unadike B.C,  
Dept. of Internal Medicine
  2. Etukumana E.A,  
Dept. of Family Medicine
  - 1-2. University of Uyo Teaching Hospital  
Uyo - Akwa Ibom State. Nigeria.

Correspondence:

Unadike B. C,  
E-mail: bernadike@yahoo.com

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### INTRODUCTION

Diabetes mellitus is a disease that is undergoing an unprecedented growth globally. This dramatic increase is due to increasing obesity, as a result of unhealthy lifestyle, reduced physical activity and increasing life expectancy since the prevalence increases with age.<sup>1,2</sup>

The current prevalence of diabetes mellitus is put at about 150 million and is projected to increase to 220 million and 300 million by 2010

and 2025 respectively.<sup>3,4</sup> Diabetes is the leading cause of kidney failure, blindness, non traumatic lower extremity amputation and a leading cause of cardiovascular disease.<sup>5</sup>

However, diabetes is a largely preventable disease and this is where diabetes health education and public awareness becomes critically important. Healthcare workers especially nurses constitute the major channel for the delivery of this important diabetes education both to the public and patients as studies have shown that ward nurses are the patients most frequent contact.<sup>6,7</sup>

This study therefore set out to find the awareness and knowledge of diabetes mellitus amongst nurses in a tertiary hospital in Nigeria.

## METHODOLOGY

This was a cross sectional descriptive study. It was carried out at the University of Uyo Teaching Hospital, Uyo between June to December 2008. This is a tertiary hospital situated in the oil rich Niger Delta Region of Nigeria. The hospital caters for patients from Akwa Ibom, Cross River, Rivers, Abia and other neighboring states. A structured questionnaire was administered to consecutive nurses who consented to the study on the clinical features, diagnosis, complications and management of diabetes mellitus. Nurses were drawn from the wards and other departments in the hospital. The collected data were analyzed using Epi info 3.2.2 (CDC, Atlanta, Georgia USA). Ethical approval was obtained from the Ethics Committee of the University of Uyo Teaching Hospital.

## RESULTS

*Baseline Characteristics:* A total of 113 nurses completed the questionnaire and returned same. Forty one (36.3%) of them were the age of 30 years and below, while 84% of the nurses were below 50 years. Only 3.5% of them were more than 60 years.

Nurses from the medical wards accounted for the largest number with 28.3% of them in this study. Ward nurses were 80.6% while 19.5%

came from other areas of the hospital (out patient clinic, immunization centre, administrative nurses). Less than half (45.1%) of the nurses had less than 5 years experience, but 51.3% had more than 10 years of experience as staff nurses. The characteristics of the respondents were as shown in Table-I.

*Knowledge on Diagnosis:* Ninety eight subjects (86.7%) identified DM as hyperglycaemia secondary to insulin deficiency, while 12.4% said it was due to excessive passage of urine. When those who identified it correctly (86.7%) were compared with those who did not (13.3%), the p value was significant ( $p < 0.0001$ ). Twenty seven of the subjects (26.7%) identified  $>7\text{mmol/l}$  as being the diagnostic cut off value for diabetes, 31.7% said it was  $>8\text{mmol/l}$ , while 41.6% said it was  $>5\text{mmol/l}$ . Ninety two percent of the subjects agreed that diabetes mellitus is a chronic disease and when compared with the 8% who did not agree, it was statistically significant ( $p < 0.0001$ )

In terms of the knowledge of the clinical features of diabetes mellitus, 33% of subjects identified three clinical features of diabetes mellitus, while 10.6% only were able to identify five

Table-I: Baseline Characteristic of Study Subjects

Age (years)	Frequency (%)	Confidence Limit
<30	41 (36.3%)	27.4-45.9
31-40	28(24.8%)	17.1-33.8
41-50	26(23%)	15.6-31.9
51-60	14(12.4%)	6.9-19.9
>60	4(3.5%)	1.0-8.8
Place of Work	Frequency (%)	Confidence Limit
Medical ward	32(28.3%)	0.2-37.6
Surgical ward	23 (20.4%)	13.4-29
Pediatric ward	16 (14.2%)	8.3-22.0
Obs and Gyn ward	20 (17.7%)	11.2-26
Others	22(19.5%)	12.6-28
Years of Experience	Frequency (%)	Confidence Limit
< 5 years	51(45.1%)	35.8-54.8
5 - 10 years	4 (3.5)	1.0-8.8
10 - 15 years	30 (26.5)	18.7-35.7
> 15 years	28 (24.8)	17.1-33.8

clinical features. Polyuria (63.7%) and Polydypsia (90.3%) were the most common clinical features identified by subjects while recurrent infection was the least (23.9%). Of the respondents who answered the question, 50.9% identified one clinical feature of diabetic ketoacidosis, while 12% identified four clinical features. Dehydration was the most common clinical feature identified by 74.1% followed by nausea and vomiting (52.8%) with dyspnoea being the least (31.5%).

*Management of Diabetes Mellitus:* In terms of management of diabetes, (48.6%) of the respondents were able to identify three methods of management viz dietary, insulin and oral hypoglycaemic agents. Insulin therapy was the commonest form of management identified by 80.7% of the respondents. Ninety four subjects (83.7%) agreed that weight reduction is useful in diabetes management while 6 (5.3%) did not know the answer to the question.

Majority of the respondents (67.2%) could identify two oral hypoglycaemic agents, while 20.4% of them said they did not know any oral hypoglycaemic agent. When asked to identify 3 types of insulin, 40.7% of the respondents correctly identified 3 types, while 25(22.1%) could not identify any type of insulin. When those

who could identify at least one (17.7%), were compared to those who could not identify any (22.1%), the difference was statistically significant ( $p < 0.001$ ).

In the identification of site for injection, the thigh was the most common site identified by the respondents (84.1%), followed by the abdomen (57.5%), upper arm (45.1%) and buttocks (7.9%) as the site of insulin injection. Less than half (44.2%) of the respondents identified one site for injection while only 7 (6.2%) could correctly identify all four sites. Majority of the respondents (92.9%) said insulin can be given subcutaneously, 17.7% said it can be given intravenously while 12.4% said it can be given intramuscularly. More than half (76.1%) could identify one route of administration of insulin. Few (9.7%) identified three routes and 5.3% could not identify any route of administration. Majority (94.7%) of the respondents agreed that hypoglycaemia can be treated by giving sugary drinks and twenty six respondents (23%) said glucagon injection can be useful in its treatment.

Majority of the nurses (85.8%) agreed that intravenous dextrose can be used to treat hypoglycaemic coma, while 7.1% said insulin can be used in its treatment.

Table-II: Awareness of Clinical Features of Hyperglycaemia, Diabetic Ketoacidosis, and Organ / System Affected by Diabetes.

<i>Hyperglycaemia</i>	<i>Clinical Features</i>	<i>Total Respondents</i>	<i>%</i>
	Weight loss	45	(39.8%)
	Polyuria	102	(40.3%)
	Polyphagia	59	(52.2%)
	Polydypsia	72	(63.7%)
	Recurrent Infection	27	(23.9%)
DKA	Abdominal pain	37	(34.2%)
	Nausea & vomiting	57	(52.8)
	Dehydration	80	(74.1%)
	Dyspnea	34	(31.5%)
<i>Organs Affected by DM</i>	<i>Organ</i>	<i>Total Respondents</i>	<i>%</i>
	Kidney	64	(56.6%)
	Eyes	93	(82.3%)
	Nervous System	49	(43.4%)
	Blood vessels	37	(32.7%)

\* DKA = Diabetic Ketoacidosis, DM = Diabetes Mellitus

Table-III: Knowledge of diagnosis of Diabetes Mellitus

	Total Respondents	%
DM is secondary to insulin deficiency	98	(86.7%)
Excessive weight gain	1	(0.9%)
Excessive passage of urine	14	(12.4%)
Value or Diagnosis	Total Respondents	%
>7mmol/l	27	(26.7%)
>8mmol/l	32	(31.7%)
>5mmol/l	42	(41.6%)
DM is a chronic Disease	Yes 104	(92%)
	No 9	(8%)

\* DM = Diabetes Mellitus

*Complication of Diabetes:* In terms of complication the eye was the organ mostly identified to be affected by Diabetes (82.3%) followed by the kidney (56.6%) and the blood vessels the least (32.7%). Forty three (38.1%) of the respondents could identify one organ as being complicated by diabetes, 21.2% four organs and 4.4 % could not identify any organ complication of diabetes. Ninety five (84.1%) identified excessive insulin dosage as being the cause of the hypoglycaemia, while only 40.7% of them agreed that heavy exercise can cause hypoglycaemia.

When asked about diabetic ketoacidosis, most respondents (84.1%) agreed that there will be ketonuria, 34.5% said there will be high blood glucose, 40.7% said admission is necessary, 44.2% said it is a dangerous situation while 31.5% agreed that insulin is necessary.

Majority (78.8%) of the respondents agreed that diabetic patients need special foot care examination while 74.3% agreed that all diabetic patients should have an annual eye examination. Few (18.6%) of the respondents agreed that the diabetic diet is suitable for every one, while 96.5% were of the opinion that diabetic patients should increase their consumption of vegetable.

## DISCUSSION

As the incidence, prevalence and diagnosis of diabetes mellitus (DM) increase, so more people will require care from health professionals. One way to reduce the morbidity and mortality from diabetes is to educate people with diabetes in self-care practices.<sup>8</sup> The quality of information they receive will depend on the knowledge and experience of staff in diabetes care.<sup>9</sup> Nurses are often the first point of contact for people seeking information on diabetes care.<sup>10,11</sup> It would therefore be seen necessary for all qualified staff to have sufficient knowledge to educate others appropriately.

Diabetes mellitus is a clinical syndrome characterized by hyperglycaemia due to absolute or relative deficiency of insulin. More than one fifth of the nurses identified the correct definition of DM as being secondary to insulin deficiency. Insulin deficiency causes hyperglycaemia which causes the acute and chronic complications of diabetes. Some of the nurses said that the definition is excessive passage of urine. Diabetes mellitus is not the only cause of polyuria and enhanced nurse's education is advocated to correct this misconception. In a similar study among nurses in Tripoli, 95% of them identified DM as being secondary to insulin deficiency.<sup>12</sup>

One of the current diagnostic criteria for DM is a fasting plasma glucose of >7mmol/l.<sup>13</sup> The fasting plasma glucose is often used because it is convenient, reliable and reproducible. Less than one third of the nurses identified this cut-off. This is rather poor since without prompt diagnosis many patients will be missed, only to present later with chronic complications of diabetes. This poor knowledge is at variance with the Tripoli study in which 96% knew the range of fasting plasma glucose.<sup>12</sup> Improved nursing education is advocated to correct this poor understanding. Diabetes mellitus is a chronic disease that requires life long management if the patient is to escape the long term complications of the disease. Almost all the nurses agreed with this, similar to the Tripoli study.<sup>12</sup>

The clinical features of diabetes include polyuria, polydypsia, weight loss, polyphagia, recurrent infections amongst others. More than 2/3 of the nurses identified polyuria and polydypsia. Many of the persons with diabetes mellitus are likely to present with these symptoms to healthcare personnel, and many people also attribute excessive passage of urine to diabetes in our society. Less than half (39.8%) identified weight loss as a symptom of DM; this may be due to the fact that many adult patients with DM that they see are obese.

More than half of the nurses could identify one feature of diabetic Ketoacidosis. This is an acute complication of diabetes with mortality rate of about 5 – 10%. Most patients present with dehydration and more than 2/3 of the nurses identified this. However, knowledge about other aspects was poor as only 12% identified four clinical features. Improved nursing education is advocated to improve this knowledge.

Management of diabetes involves dietary therapy, oral hypoglycaemics and insulin. About 4/5 of them identified insulin as a form of management while less than 2/3 identified oral hypoglycaemic agents. Possible reason for this may be that majority of ill patients in the wards receive insulin injection and rarely oral hypoglycaemic agents and also because insulin is almost synonymous with diabetes. Majority identified weight reduction as a form of management, similar to 87% in the Tripoli study.<sup>12</sup> Weight loss ameliorate insulin resistance which is a cause of type 2 DM.

Oral hypoglycaemic drugs are the main stay of management of type 2 DM which is the most common form of Diabetes.<sup>13</sup> Some of the medications like biguanides also have favourable effects on weight loss. Knowledge about this was poor as about 1/5 of the nurses could not identify any oral hypoglycaemic agent. This is similar to the Tripoli study where 13% could also not name any drugs. This is rather poor and adequate nursing education is advocated to improve this knowledge. A similar study in the UK showed poor knowledge about type 2 diabetes amongst nurses.<sup>14</sup> With the increasing

world wide prevalence of type 2 DM this gap in knowledge must be addressed amongst these nurses.

Knowledge about insulin was also poor as more than 1/5 was not able to name any type of insulin. Insulin therapy is useful in hyperglycaemic emergencies and also for treatment of patients with type 1 Diabetes. This deficit in knowledge should also be addressed by regular education of the nursing staff.

At least 44.2% could identify one injection site of insulin correctly. This knowledge however is in contrast to a study in the UK that showed that 67% of the study subjects could not identify the correct site for insulin injection.<sup>14</sup> Majority of the subjects correctly identified the treatment of hypoglycaemia. This is rather encouraging since hypoglycaemia carries a substantial mortality if not correctly treated. Other studies showed similar high knowledge among the nurses.<sup>12,14</sup> Majority also knew the correct treatment of hypoglycaemic coma. However, few of the nurses said that insulin can be used in the treatment of hypoglycaemia. This is rather dangerous, and continuous nursing education to correct this gap in knowledge is advocated. In the UK study majority of the nurses were lacking in knowledge about recognizing and treating hypoglycaemia correctly.<sup>14</sup>

Diabetes mellitus can lead to microvascular and macrovascular complications. Macrovascular disease is the leading cause of death in diabetic, while microvascular disease like diabetes nephropathy is the leading cause of kidney failure worldwide.<sup>15</sup> Majority of the nurses identified the eye as the most common organ affected, and blood vessel the least. Although Diabetes is the leading cause of blindness worldwide, majority of the deaths are from macrovascular disease like stroke and myocardial infarction. Education to fill this gap in knowledge is advocated. Majority of the nurses identified the cause of hypoglycaemia in diabetic similar to earlier studies.<sup>14</sup>

Diabetic ketoacidosis is an acute complication of diabetes seen in type 1 diabetes with a mortality of about 5 – 10%. There was a below average awareness about the symptoms of diabetes

ketoacidosis. This is in contrast with a very good knowledge seen in studies elsewhere.<sup>12,14</sup> It is encouraging that majority of the nurses agreed that diabetes need special foot care. The cost of diabetes foot ulcer is enormous and hence foot care is essential to prevent this complication.<sup>16,17</sup> In the UK study 100% of the respondents agreed that foot care is important in diabetes.<sup>14</sup> Less than 25% of the nurses agreed that the diabetic diet is good for everyone. Similar studies elsewhere in Africa have also shown deficiency in knowledge amongst nurses.<sup>18</sup> Jayne and Rankin in an earlier study identified areas in which there were lacks of knowledge amongst nurses as site of insulin injection, clinical signs of hypoglycaemia and hyperglycaemia and effects of illness on blood sugar.<sup>19</sup> Also a positive correlation between nurses actual and perceived knowledge was shown by El Dierawi and Zuraikat.<sup>20</sup> Similar studies elsewhere have also shown similar deficiencies in knowledge amongst nurses, in certain aspects of diabetic care.<sup>21,22</sup> With the increasing prevalence and incidence of diabetes, nurses must improve their understanding of diabetes in order to care for patients since they are the patients most frequent contact and this will improve overall diabetic control.<sup>23</sup>

## CONCLUSION

This study revealed that overall nurses' knowledge was adequate, but there was a deficiency in certain aspects of diabetes management. Therefore, Diabetic educational programmes to enhance nurses understanding are advocated. These would improve their ability to care for patients and contribute positively towards diabetic management.

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