

Full Length Research Paper

Is routine preoperative assessment for diabetes mellitus necessary in patients without a family history?

Ashindoitiang John Adi* and Akinlolu O.O.

General Hospital, Ikorodu, Lagos, Nigeria

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The study was carried out to determine the clinical value of routine blood glucose testing in patients undergoing elective surgical procedures. Diabetes is very common disorder. It affects approximately 8% of the population in the United States but the prevalence in Nigeria is not known but it is increasingly a common medical condition. DM is frequently encountered in surgical patients that have not been diagnosed with the disorder. Furthermore, surgical procedures are more common in diabetics than non diabetics because eighty percent of diabetics are over 40 years and surgical procedures are more common in this age group. Again diabetes and its complications predispose to variety of surgical disorders. With the increasing prevalence of diabetic patients requiring surgery and the enormous risk of complications associated with the disease, adequate preoperative assessment is mandatory. We studied 75 patients consecutively with various surgical disorders that underwent elective surgery within a period of 1 year (May 2009-April 2010). Each patient had fasting blood sugar (FBS) testing before surgery. In addition patient's family history of diabetes, weight, height, and hip and waist size were obtained and entered into a structured proforma. The patients with dysglycemia were reevaluated with repeat FBS and HbA1c. The BMI and Waist/Hip ratio were later calculated, A total of 75 patients were recruited. Children below the age of 18 years were excluded. There were 54 males and 21 females giving M: F 2.5:1. The age range was between 18-80 years with a mean of 48.7 years. A total of 21 patients (28%) had FBS >126mg/dl and HbA1c >6.5%. Hyperglycemia of ≥ 126 mg/dl and HbA1c >6.5% increases with age. 16 patients in this study had BMI above 30 (obese). 11 out of the 16 had FBS > 126mg/dl $p < 0.001$ Also 13 patients had positive family history of diabetes, 9 out of the 13 had FBS >126mg/dl. The waist/hip ratio did not show any significant value in predicting patients with disordered blood glucose. Hyperglycemia was found in the patients with unusual infections namely palmar abscess and anorectal abscess. Diabetes is common disorder and is frequently encountered in surgical patients who have not been diagnosed with the disorder. From this study we recommend screening for diabetes in surgical patients that are above 40 years, patients with family of the disorder, obese individuals and patients with unusual infections.

Keywords: Preoperative diabetic assessment, adult patients, elective surgical procedures.

INTRODUCTION

Preoperative laboratory tests before surgery despite low risks of per operative complications is widely practice across the world (Kaplan et al., 1985). Despite its widespread use, systematic evaluation of the clinical value and cost effectiveness of the routine laboratory testing is often lacking (Johnson and Motimer, 2002). Current preoperative recommendations have not advocated routine testing for diabetes (Ann et al., 2009).

However with the high prevalence of undiagnosed diabetes, it is necessary to screen surgical patients as hyperglycemia increases the risk of surgical infections, poor wound healing, hospital resource utilization and increase morbidity and mortality (Jacobson and Sowers, 199). Nevertheless not all surgical patients need to be screened.

The American Diabetes Association guidelines recommend screening for adults age 45 years or older and in younger overweight patients with at least one additional risk factor, (American Diabetic Association Standard of Medical care in Diabetes, 2009) viz BMI >

*Corresponding Author E-mail: ashindoitiang@yahoo.com

Table 1. Age and Sex Distribution of the patients

Age Group	males	females	percentage
18-30	10	3	17.3%
31-40	10	3	17.3%
41-50	10	5	20%
51-60	15	5	26.7%
61-70and above	9	5	18.7%
Total	54	21	75(100%)

Table 2. Diagnosis of the patients Study

Diagnosis	Number	Percentages
Sub acute appendicitis	10	13.3%
Fibroadenoma	8	10.7%
Inguinal hernia	20	26.7%
Cancer of the breast	6	8%
Lipoma	10	13.3%
Vaginal hydrocoel	6	8%
Basal cell carcinoma	2	2.6%
Anorectal abscess	6	8%
Palmar abscess	4	5.3%
others	3	4%
Total	75	100%

25kg/m², physical inactivity, first degree relative of DM patient, high risk ethnic population, hypertension, HDL<35mg/dl or triglyceride>250mg/dl, women with polycystic ovarian syndrome, women with macrocosmic babies

Furthermore, it is observed that about a third of hospitalized patients with diabetes have not been diagnosed with the disorder (Capes et al., 2003). The American Diabetes Association conservatively estimates 12-25% of hospitalized adults have diabetes mellitus. Hence, it is pertinent to have appropriate preoperative assessment to detect patients that are at risk so as to institute management to avoid risk of complications associated with diabetes mellitus. This study was carried out to determine which surgical patients need to be screened.

SUBJECTS AND METHODS

We studied 75 patients consecutively with various surgical disorders that underwent elective surgery within a period of 1 year (MAY2009-April 2010) in semi urban general hospital (IKORODU GENERAL HOSPITAL). Each patient had fasting blood sugar (FBS) testing before surgery. In addition, each patient's family history of diabetes weight, height, and hip and waist size were taken and entered into a well structured questionnaire.

The BMI and WAIST/HIP ratio were later calculated. The patients that had FBS \geq 126mg/dl had repeat FBS and glycosylated hemoglobin (HbA1c). They were also screen for suggestive symptoms, eating habits, current medications, smoking and history of hypertension. The data obtained were analyzed with EPIFO 6 to determined the mean, standard deviation and the p-value set 0.05 as statistical significance

RESULTS

A total of 75 patients were studied. Children below 18years were excluded.

The age and sex distribution of the patients is shown in Table 1

Surgical disorders were more common in males and occurs commonly between the age of 40-50 years and decline afterwards,

There were 54males (72%) and 21females (28%) giving M: F 2.5:1

The age range was between 18-80years with a mean of 48.7 ± 16

Table 2 shows the diagnosis of the patients studied. Hernia was the most common disorder follow by sub acute appendicitis and lipoma.

A total of 21 patients (28%) had FBS \geq 126mg/dl and HbA1c \geq 6.5%. Hyperglycemia \geq 126mg/dl increases with

age. It was found to be 20% in the age 18-40 but increases to 35% in age 40- 80years,

16 patients (21%) in the study have BMI \geq 30 and above. 11(68.8%) of this 16 had FBS \geq 126mg/dl and HbA1c \geq p<0.001.

13patients (17.3%) of the 75 patients had positive family history of diabetes.9 (69.2%) of the 13 had FBS \geq 126mg/dl and HbA1c \geq 6.5%p<0.001. Patients with disordered blood sugar had other medical conditions such as hypertension and osteoathrosis. Few of the patients with hyperglycemia have positive history of smoking, and poor exercise history. All the patients studied were not previously diagnosed and had no suggestive symptoms.

The waist/hip ratio did not show any significant value in predicting patients with disordered blood sugar.

Hyperglycemia was found in 8 out of the 10 patients with palmar and anorectal abscesses.

DISCUSSION

Patients with diabetes are more likely to undergo surgery than those without diabetes (Levetan et al., 1998; Edelson et al., 1990). This is because diabetes predisposes patients to surgical disorders such as operative infections like anorectal abscess, poor wound healing, cataract, renal insufficiency necessitating renal transplant, diabetic foot and so forth. Mortality rate has been estimated to be 5 times greater in DM than non diabetic patients (Root, provide year; Hall and Page, 1999; Hirsch et al., 1999).

Surgery in diabetic patients is associated with longer hospital stay, increased wound infection, higher health care resource utilization and greater perioperative mortality than in non diabetics. Evidence from observational studies suggests that improvement in glycemic control affects the morbidity and mortality (Albert and Thomas, 1979; Noodzu et al., 2007).

The storage body of evidence comes from cardiac surgery. Few studies have reported an association between glucose levels and mortality in general surgery (Pomposulli et al., 1998).

The aim of this study was to determine the criteria for screening patients undergoing elective procedure in general surgery. Current preoperative recommendations have not advocated testing for diabetes. However with the increasing prevalence of diabetes and its surgical complications, it will be pertinent to screen those that are likely to be at risk.

The preoperative assessment should include comprehensive history and physical examination. Because it is estimated that over 25% of diabetic patients are unaware of the disease it is pertinent to screen patients undergoing surgery by estimating the fasting blood sugar or random blood sugar for emergency cases. DM can then be confirmed in those with abnormal values

with HbA1c.

Adults aged 65 years and above have the highest prevalence of DM that estimated to approximately 12 times the prevalence in younger people(National Diabetes Facts Sheet, 2005).This study shows that the incidence of DM increases with age and particularly significant from age 40years and above.

The prevalence of obesity among adults has risen in the United States in the past 20years and this trend is also seen in developing countries such as Nigeria. Among individuals with DM age-adjusted rates of being overweight or obese was observed (National Diabetes Facts Sheet, 2005). It was observed in this study that individual that were overweight or obese were found that have increase incidence of having hyperglycemia.

Family history of diabetes is a well established etiology of DM in related patients and this study show an association between family history of DM and increase incident of hyperglycemia.

Dm predisposes individual to infections due to impaired leucocyte function including altered chemotaxis and phagocystic activity. Hence it was prevalent in patients who presented with uncommon infections such as palmar abscess and anorectal abscess.

The fact that glucose testing was done routinely in patients with no known diabetes and found up to 28% of patients with hyperglycemia which includes some young patients raises concern on the prevalent of DM.

Levetan *et al* (Levetan et al., 1998) observed that one third of both medical and surgical patients with hyperglycemia at time of hospital admission did not have diagnosis of diabetes. This study has also similar prevalence of 28% in preoperative healthy patients.

From the results of our study, we conclude that routine measurement of blood sugar will provide valuable information in management of surgical patients as hyperglycemia is associated with surgical risks of infection, increased morbidity and mortality. We recommend that patients with family history, advanced age, obese or overweight and unusual infections should the raised suspicion of likelihood of increased risk of diabetes and therefore should be screened.

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