ABSTRACT

Background and objectives:

Hyperglycaemic emergencies (HE) are common medical emergencies in Nigeria and they are associated with high morbidity and mortality. This study set out to determine the pattern of presentation and types of HE in the University of Benin Teaching Hospital, Benin City, to assess the outcomes in patients and to ascertain the factors associated with outcome with emphasis on the determinants of outcome.

Methodology:

A total of 105 patients admitted to the Accident and Emergency unit who fulfilled the criteria for hyperglycaemic emergencies were selected using a non-probability sampling technique. The information extracted included socio-demographic, clinical and laboratory data and hospitalization outcome. Capillary blood was obtained under strict sterile conditions for measurement of glucose level while venous blood was taken simultaneously to determine levels of plasma glucose (PG), electrolytes, urea and creatinine. Plasma glucose was monitored hourly while plasma potassium was checked at 0, 4, 12 and 24 hours. Rehydration was carried out using isotonic saline initially and later changed to 5% dextrose saline infusion when the plasma glucose level (PGL) fell to 250mg/dl. A dose of 20 units of soluble insulin (10 units intravenously and 10 units intramuscularly both as statim doses) was given and this was subsequently followed by 6 units intravenously every hour until PGL fell to less than 250mg/l (13.8mmol/l). Then 6 units of soluble insulin were added to each 500mls of 5% dextrose saline infusion to run 4 hourly. Potassium therapy was instituted when patients were making at least 30ml/hr of urine. Statistical comparison of proportions was done with chi-squared test, while the students t-test was used for comparison of means. A p-value of less than or equal to 0.05 was accepted as the level of statistical significance.

Results:
Of the 105 subjects that participated in the study, hyperosmolar hyperglycaemic non ketotic state (HHNK) was seen in 50% (53) of the subjects, while diabetic ketoacidosis (DKA) was seen in 31% (29), Normoosmolar non-ketotic hyperglycaemic state (NNHS) in 12% (13) and MIXED hyperglycaemic emergency in 7% (10) of the subjects. The mean (SD) age was 54.0 (4.64) years (range 21-85 years), there was a significant difference in the mean age for the different groups of HE (p=0.01): the highest mean age of 58.1±3.97 was in HHNK patients while the lowest mean age of 43.4±3.00 was in DKA patients. Ninety-one subjects (86.7%) had type 2 DM and 14 (13.3%) had type 1 DM. Nineteen subjects (18%) with HE were presenting with diagnosis of DM for the first time. The commonest precipitating factor in this study was infection accounting for 57% of cases, followed by non-adherence to drugs (15%). Majority of patients presented with polyuria, polydipsia and weight loss. The mean PG at presentation was 549mg/dl (range 304mg/dl to 660mg/dl). The mean PG was significantly higher in the HHNK group (p=0.01) with a mean value of 611.4mg/dl compared with the DKA group, which had the lowest mean plasma glucose of 439.8mg/dl. The mean serum ketone at presentation was 2.2mmol/L (range 0.2 to 14.7mmol/L). The mean serum osmolarity in this study was 323mosm/l (range 291 to 366 mosm/l). Subjects with HHNK had the highest mean serum osmolarity of 336mOsmol/l while subjects with DKA had the lowest mean serum osmolarity of 304mOsmol/l and this difference was statistically significant (p=0.01). There was no significant association between socio-demographic parameters and outcome (p=0.99). Similarly, the number of co-morbidities of DM had just a significant influence on outcome (p=0.05). The association of clinical parameters such as BMI, dehydration, fever and level of consciousness on the outcome was not statistically significant (p>0.05). Also the influence of laboratory parameters such as HbA1c, WBC, hypokalaemia, hypoglycaemia on the outcome was not statistically significant (p>0.05). The overall mortality rate in this study was 4.8%. Three deaths were recorded in patients with HHNK, while DKA and NNHS each had one death. Three of the deaths occurred within the first 24 hours of admission while the other two were after 24 hours of admission. The mean (SD) total duration of hospital stay was 24.2 days and the range of stay was 0.5 to 88 days.
**Conclusion:**

The most common type of hyperglycaemic emergency seen in this study was hyperosmolar hyperglycaemic non ketotic state (HHNK). The commonest precipitating factor in this study was infection (with infected diabetic foot ulcer being the commonest type of infection seen in this study) and this is followed by non-drug adherence therefore, emphasis should be placed on early diagnosis and adequate management of HEs while infections and other precipitating factors should be promptly identified and treated in order to reduce morbidity and mortality associated with HEs.