



## A STUDY ON CLINICAL PROFILE OF PATIENTS OF HYPERGLYCEMIC EMERGENCIES

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### ABSTRACT

**BACKGROUND :** Diabetes is a chronic metabolic disorder ,In our study we are going to see the clinical profile of patients of hyperglycemic emergencies .

**OBJECTIVES :** To study about the clinical profile patients of hyperglycemic emergencies and the precipitating factors and the disease load on community / in rural part of southern part of tamilnadu.

**STUDY DESIGN :** 100 patients of HEs admitted in IMCU of Gov Theni medical college during the period of september 2016 to december 2016.

**RESULTS:** 41% of patients had associated SHT , 23% had CAD and 32 % had CKD. 74 patients had DKA and 26 % had HHS. The common precipitating factor seems to be drug withdrawal, foot infections, UTI, pneumonia, myocardial infection, sepsis etc

**CONCLUSION:** Mortality were increased in elderly patients and with more and severe co morbid factors .

**KEYWORDS :** Hyperglycemia ,sepsis ,diabetic ketoacidosis

### INTRODUCTION

Diabetes is one of the most important non communicable disease worldwide due to its increasing prevalence .both hypoglycemia and hyperglycemia are emergencies in diabetic clinical scenerio. DKA and HHS (hyperosmolar kyperhlycemic state) are the most common hyperglycemic emergencies in day to day clinical practice. Diabetic keto acidosis pathophysiologically involves decreased availability of effective insulin in our body and which was not available to manage the glycemic overload. Hyperglycemia in DKA may be due to increased intake or may be increased counter regulatory hormones like GH, glucogon ,cortisol and catacalamines. These instances leads to hyperglycemia and ketosis .DKA is a catabolic state and there is also defect in protein, lipid and carbohydarte metabolism and leads to acidosis .DKA and HHS often leads to increased mortality and fatal complications if left untraeted .

### MATERIALS AND METHODS

Total of 100 patients including both T1DM and T2DM who were getting admitted to intensive medical care unit in Govt Theni Medical college included in this study .The clinical profile including sex,age ,type of diabetes , duration of diabetes , symptoms ,clinical signs ,associated co morbid factors like systemic hypertension , coronary artery disease and chronic kidney disease , electrolyte abnormalities , precipitating factors and outcome of patients of hyperglycemic emergencies were assesed . Patients on steroids and immunosuppressive therapy ,other endocrine abnormalites like cushings syndrome ,acromegaly were excluded from the study

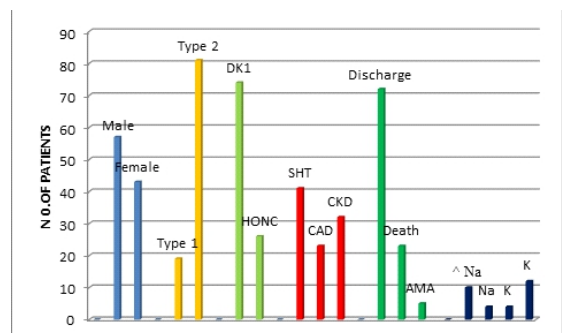
Criteria for DKA : blood sugar > 250 mg/dl ,Arterial pH < 7.3 and HCO3 <15mmol/dl ,moderate degree of ketonuria and ketonemia .

HHS criteria : blood sugar >13.3mmol , HCO3 >18 mmol/dl , with or without ketonuria ,increased osmolality, Hyponatremia defined as serum Na >155 mEq/l , hyponatremia is defined as serum Na <125 mEq , hypokalemia defined as < 3.5mEq/l, hyperkalemia defined as serum K> 5.5 mEq/l.

### RESULTS

Out of 100 patients of diabetes 57 are male and 43 are females. There were 19 % of T1DM and 81 % of T2DM patients . 29% of patients belongs to 51-60 yrd of age group ,22% were belongs to more than 60 yrs ,18% were belongs to 41-50 yrs ,12% were belongs to 31-40 yrs , 10% were belong s to 16-20 yrs , 6 % were belongs to 21-30 yrs and 3 % were belongs to less than 15 yrs. Hyperglycemic emergency more common in patients with age group of 51-60 yrs.

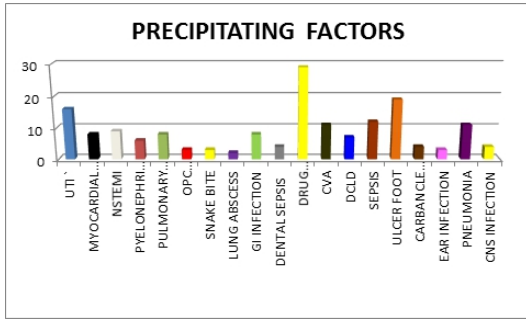
We assesed about the co morbid factors associated with these hyperglycemic emerecy patients.41 patients had associated systemic hypertension, 23 patient had associated coronary artery disease and 32 % had associated with Chronic kidney disease. Many had more than one comorbid factors like aneamia, chronic obstructive pulmonary disease and seizure disorders.



Electrolyte abnormalities were assesed in our study , there were 10 % patients had hyponatremia, 4% patients had hypernatremia, 4% had hypokalemia and 12% had hyperkalemia. Electrolyte abnormalities correlated with associated co morbid factors like hyperkalemia was seen more common in diabetic patients who had associated CKD. Hyponatremia was seen more common in elderly patients.

Out of 100 patients presented with hyperglycemic emergencies 74 patients got treatment, they were improved clinically and

biochemically and got discharged .21 % had mortality due to age factors ,associated co morbid factors and late arrival and delayed presentation to hospital.



The precipitating factors for these hyperglycemic emergencies were noted . The most common precipitating factor was drug withdrawal either OHA or insulin (29%), the cause for the treatment withdrawal may be drug non compliance , not able to afford for the treatment, inadequate knowledge about diabetes , its complications and improper guidance .There are 19 % of patients had diabetic foot ulcer as a precipitating factor , 16 % of patients had lower urinary tract infections , 12% had sepsis as precipitating factors . 11% of patients had pneumonia , 9% patients had ischemic heart disease (NSTEMI /Unstable angina) ,8% patients had acute myocardial infarction,11% had cerebro vascular accidents , 8% had pulmonary tuberculosis, 6% had pyelonephritis, 8 % had GI infections, 4% had CNS infections, 4 % had dental sepsis, 7% patients had liver diseases, 2% had lung abscess, 3% had snake bite with cellulitis and 3% had organo phosphorous poisoning as a precipitating factors.

Single patient had one or more co morbid as well as precipitating factors . the mortality rate was very high in patients with more and severe precipitating factors and more co morbid factors.

76% of patients had DKA and 24% of patients had HHS.

## DISCUSSION

Hyperglycemic emergencies are important cause of death in previous studies, hence we undertook the clinical, biochemical correlates and mortality rates associated with these important complications in our practice.

The incidence of DKA in USA is 4.6 – 8.0 per 1000 person per year among patients with DM and incidence of HHS is less than 1 per 1000 per year.

Mortality rates due to hyperglycemic emergencies from sub saharan –africa and asia range from 30-44 % ,in our study it was about 21% comparatively low.

An earlier report by Ogbera et al \_showed that hyperglycaemic emergencies account for 40% of all DM related hospitalization with a preponderance of DKA admissions compared to that of HHS

Electrolyte imbalance are the consequence of hyperglycemia ,hyperosmolality and acidosis . Hyponatremia and hypokalemia which occurred in higher percentage of patients of HHS. Hypokalemia occurs may be due to high urinary loss of K in the face of high osmotic gradient. Hyponatremia may result from urinary loss and may be dilutional as water shifts extracellularly because of high osmolality . Hyperkalemia may be explained by shift of K from intracellular compartment to extracellular space because of acidosis from insulin deficiency and due to reduced tubular secretion .

In our study ,patients presents with symptoms like nausea,vomiting, abdominal pain and breathlessness , many of them had symptoms like increased thirst, polyuria. On examination patient had fruity odour with acidotic breathing, severe cases presented with

hypotension and altered sensorium.

DKA and HHS patients were treated with Intravenous fluids for dehydration , insulin infusion for correction of hyperglycemia. Electrolyte abnormalities were identified and treated accordingly .Treatment of the precipitating factors had been done simultaneously . All these modalities of treatment helped in clinical improvement , 74% were discharged well.

It is seen that presence of non-compliance to treatment is an important precipitating factor which indicates that prevalence of DKA can be reduced by proper education of patients about their illness and harm of non-compliance.

One of the precipitating factors found to be sputum positive pulmonary tuberculosis,pneumonia contributes another important precipitating factor. Ear infection like otitis media, dental infection, gingivitis, skin infection like impetigo and carbuncle also observed as precipitating factor in our study.

Ischemic heart disease including acute myocardial infarction , non ST elevation MI, unstable angina also observed as precipitating factors for DKA and HHS. Trauma, stress ,snake bite with cellulitis , opc poisoning also seen as precipitating factors.

Urinary tract infections including lower urinary tract infections and pyelonephritis are major factors contributing to DKA and HHS .

Diabetic foot infections like ulcer foot , cellulitis and sepsis are the major precipitating factors for the development of DKA and HHS.. Diabetes is an immunosuppressive like state ,so secondary infections are more common in diabetes. Neuropathy, Vasculopathy and secondary infection contributes diabetic foot disease which are the important features for morbidity as well as mortality. Identification and treatment of precipitating factors are the main stay treating DKA ,HHS and any other diabetic complications.

## CONCLUSION

Hyperglycemic emergencies are most important cause for morbidity and mortality due to diabetes. There is a need for diabetes screening programmes and health education programmes to create public awareness regarding risk factors for diabetes, target organ damages, early detection methods, treatment options, its complications, its sequences and its preventive strategies.

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