

Awareness of Diabetic Ketoacidosis (DKA) Among Allied Health Science Students

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Introduction: Diabetic ketoacidosis (DKA) is the most common acute hyperglycaemic emergency in people with diabetes mellitus. A diagnosis of DKA is confirmed when all of the three criteria are present - 'D', either elevated blood glucose levels or a family history of diabetes mellitus; 'K', the presence of high urinary or blood ketoacids; and 'A', a high anion gap metabolic acidosis. Early diagnosis and management are paramount to improve patient outcomes. **Aim:** To assess the knowledge level and create awareness about diabetic Ketoacidosis among allied health science students. **Materials and Methods:** A cross-section research was conducted with a self-administered questionnaire containing ten questions distributed amongst 100 Allied Health sciences students. The students were randomly selected across various disciplines of Allied Health Sciences. The questionnaire assessed the awareness about diabetic ketoacidosis among Allied Health Sciences students. The responses were recorded and analysed. There were no incomplete responses and no dropouts from the study. The final data obtained was organised, tabulated and subjected to statistical analysis. **Results:** Among 100 allied health sciences students, 89% of students were aware warning signs of Diabetic Ketoacidosis, 72% of students are aware about symptoms of Diabetic Ketoacidosis, 66% of students know about the treatment of diabetic ketoacidosis, 75% of students know about the causes of diabetic ketoacidosis, 68% of students have idea about severity of diabetic ketoacidosis. **Conclusion:** There is adequate awareness amongst AHS students about Diabetic ketoacidosis. However, enhanced awareness initiatives and educational programmes together with increased importance for curriculum improvements that further promote knowledge and awareness of Diabetic ketoacidosis should be initiated for further understanding and benefits.

Keywords: Awareness, Allied Health Sciences, Diabetic Ketoacidosis, Insulin, students.

1. Introduction

Diabetic ketoacidosis (DKA) is an acute, major, life-threatening complication of diabetes characterized by hyperglycemia, ketoacidosis, and ketonuria. It occurs when absolute or relative insulin deficiency inhibits the ability of glucose to enter cells for utilization as metabolic fuel, the result being that the liver rapidly breaks down fat into ketones to employ as a fuel source. Treatment includes correction of fluid loss with intravenous fluids; correction of hyperglycemia with insulin; correction of electrolyte disturbances, particularly potassium loss; correction of acid-base balance; and management of concurrent infection . (1)

Diabetic ketoacidosis (DKA) is the most common acute hyperglycaemic emergency in people with diabetes mellitus. A diagnosis of DKA is confirmed when all of the three criteria are present - 'D', either elevated blood glucose levels or a family history of diabetes mellitus; 'K', the presence of high urinary or blood ketoacids; and 'A', a high anion gap metabolic acidosis. Early diagnosis and management are paramount to improve patient outcomes. The mainstays of treatment include restoration of circulating volume, insulin therapy, electrolyte replacement and treatment of any underlying precipitating event. Without optimal treatment, DKA remains a condition with appreciable, although largely preventable, morbidity and mortality. (2)(3)

Polyuria, polydipsia, weight loss, vomiting, and abdominal pain usually are present in patients with DKA. Abdominal pain can be closely associated with acidosis and resolves with treatment. Physical examination findings such as hypotension, tachycardia, poor skin turgor, and weakness support the clinical diagnosis of dehydration in DKA. Mental status changes may occur in DKA and are likely related to degree of acidosis and/or hyperosmolarity. A search for symptoms of precipitating causes such as infection, vascular events, or existing drug abuse should be initiated in the emergency room. Patients with hyperglycemic crises can be hypothermic because of peripheral vasodilation and decreased utilization of metabolic substrates(4)(5)

Hypoglycemia and hypokalemia are the most frequent complications and can be prevented by timely adjustment of insulin dose and frequent monitoring of potassium levels. Non-anion gap hyperchloremic acidosis occurs due to urinary loss of keto anions which are needed for bicarbonate regeneration and preferential re-absorption of chloride in proximal renal tubule secondary to intensive administration of chloride-containing fluids and low plasma bicarbonate. The acidosis usually resolves and should not affect treatment course.(6)(7)

Diabetic Ketoacidosis is an important medical condition that needs prompt attention and AHS students will be required in the management of this condition during the course of treatment with this disease. Hence this study was done with aim to assess the knowledge level and create awareness about diabetic ketoacidosis among Allied Health Sciences students.

2. Materials and Methods:

This cross-sectional research was conducted with a self-administered questionnaire containing ten questions distributed amongst 100 Allied Health science students. The students were randomly selected across various disciplines of Allied Health Sciences. The study setting was designated in the university campus. The survey instrument was a questionnaire pre tested and evaluated for validity and reliability concerns.

The questionnaire included ten questions eliciting the demographic data through open ended responses and multiple choice questions for the other responses. The study was approved by the Institutional Ethical Committee and informed consent was obtained from the participants. The questionnaire was posted on an online platform and the identity of the respondents were kept confidential.

The questionnaire assessed the awareness of Diabetic ketoacidosis, its causes, clinical manifestation, increased loss of water from the body resulting in Diabetic ketoacidosis, treatment and prevention among allied health science students. The responses were recorded and analysed. There were no incomplete responses and no dropouts from the study. The final data obtained was organised, tabulated and subjected to statistical analysis.

The salient in the student are:

1. Are you aware of the warning sign of DKA?
2. Are you aware about symptoms of Diabetic Ketoacidosis?
3. Do you have any idea about treatment of diabetic ketoacidosis?
4. Is illness one of the causes of Diabetic Ketoacidosis?
5. Do you know the severity of Diabetic Ketoacidosis?

3. Results:

Among 100 allied health sciences students 89% of students were aware warning signs of Diabetic Ketoacidosis (Fig 1), 72% of students are aware about symptoms of Diabetic Ketoacidosis (Fig 2), 66% of students know about the treatment of diabetic ketoacidosis (Fig 3), 75% of students know about the causes of diabetic ketoacidosis (Fig 4), 68% of students have idea about severity of diabetic ketoacidosis (Fig 5).

Fig 1.Are you aware about warning signs of Diabetic Ketoacidosis?

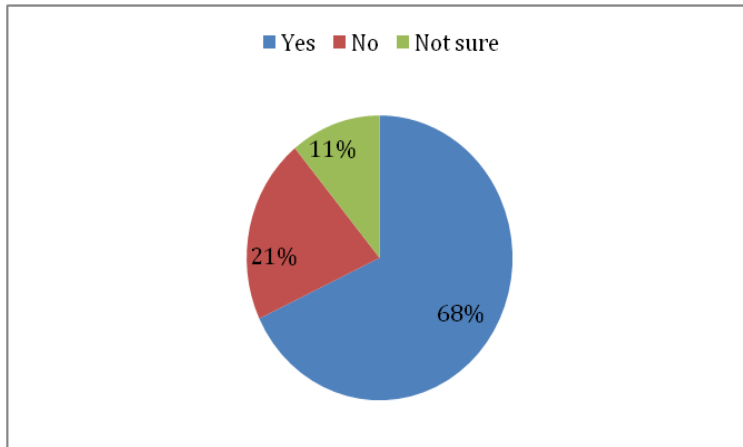


Fig 2.Are you aware about the symptoms of Diabetic Ketoacidosis?

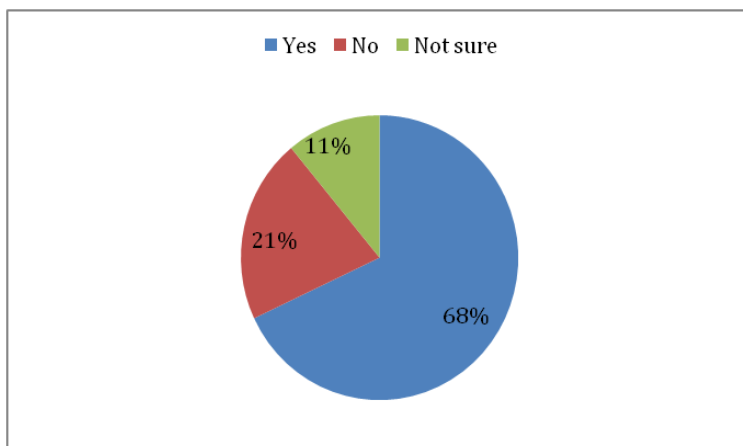


Fig 3.Do you have any idea about the treatment of diabetic Ketoacidosis?

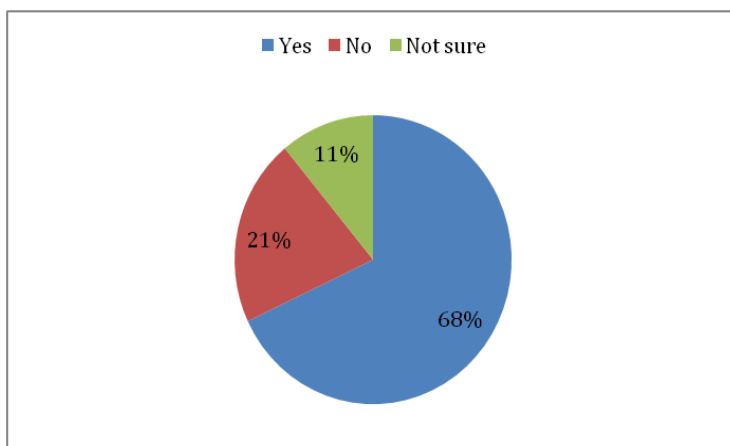


Fig 4.is illness one of the causes of diabetic ketoacidosis?

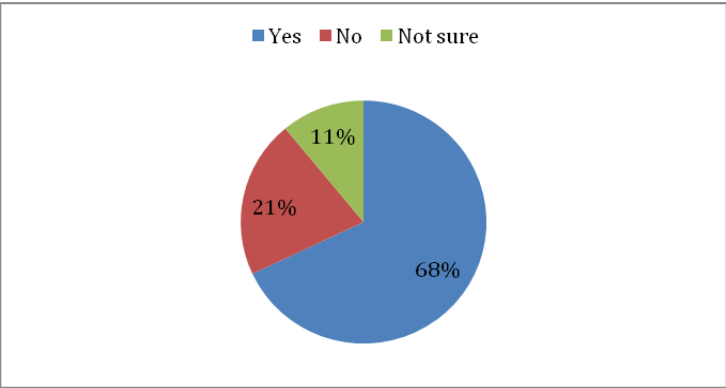
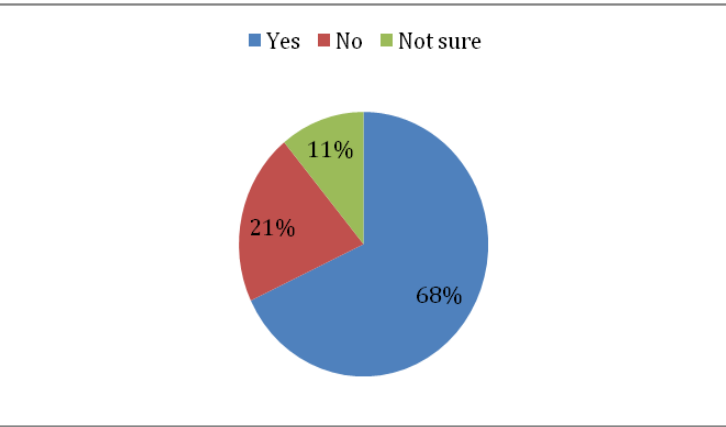


Fig 5.Do you know the severity of Diabetic Ketoacidosis?



4. Discussion:

The warning signs include :a dry mouth,a weak and rapid pulse,a low-grade fever ,a headache, nausea, and vomiting,seizures,a loss of consciousness,temporary partial paralysis. Blood tests may show that the person’s blood glucose level is above 600 mg/dl.(9) In our study 89% of the students were aware of warning signs of diabetic ketoacidosis.

Diabetic ketoacidosis signs and symptoms often develop quickly, sometimes within 24 hours. For some, these signs and symptoms may be the first indication of having diabetes. Excessive thirst,Frequent urination,Nausea and vomiting,Stomach pain,Weakness or fatigue,Shortness of breath,Fruity-scented breath,Confusion.(10) More-specific signs of diabetic ketoacidosis — which can be detected through home blood and urine testing kits — include:High blood sugar level,High ketone levels in your urine(11).In our study 72% of the students were aware of the symptoms of diabetic ketoacidosis.

Treatments like:Insulin through an IV to bring your ketones down.Fluids to get hydrated and bring blood chemistry back into balance.Electrolyte replacement through an IV to replace key

minerals like sodium, potassium, and chloride to keep heart, muscles, and nerves working properly.(12) In our study 66% of the students were aware of the treatment of diabetic ketoacidosis.

Sugar is a main source of energy for the cells that make up muscles and other tissues. Normally, insulin helps sugar enter cells. Without enough insulin, the body can't use sugar properly for energy. This prompts the release of hormones that break down fat as fuel, which produces acids known as ketones. Excess ketones build up in the blood and eventually "spill over" into the urine. Diabetic ketoacidosis is usually triggered by: An illness, An infection or other illness can cause the body to produce higher levels of certain hormones, such as adrenaline or cortisol. Unfortunately, these hormones counter the effect of insulin — sometimes triggering an episode of diabetic ketoacidosis. Pneumonia and urinary tract infections are common culprits. A problem with insulin therapy. Missed insulin treatments or inadequate insulin therapy or a malfunctioning insulin pump can leave you with too little insulin in your system, triggering diabetic ketoacidosis. Other possible triggers of diabetic ketoacidosis include: Physical or emotional trauma, Heart attack or stroke, Pancreatitis, Pregnancy. Alcohol or drug abuse, particularly cocaine. Certain medications, such as corticosteroids and some diuretics(13)(14). In our study 75% of the students were aware of the causes of diabetic ketoacidosis.

While definitions vary, mild DKA can be categorized by a pH level of 7.25-7.3 and a serum bicarbonate level between 15-18 mEq/L; moderate DKA can be categorized by a pH between 7.0-7.24 and a serum bicarbonate level of 10 to less than 15 mEq/L; and severe DKA has a pH less than 7.0 and bicarbonate less than 10 mEq/L. In mild DKA, anion gap is greater than 10 and in moderate or severe DKA the anion gap is greater than 12. These figures differentiate DKA from HHS where blood glucose is greater than 600 mg/dL but pH is greater than 7.3 and serum bicarbonate greater than 15 mEq/L(15-18). In our study 68% of the students were aware of the severity of diabetic ketoacidosis.

5. Conclusion:

There is adequate awareness amongst AHS students about Diabetic ketoacidosis. However, enhanced awareness initiatives and educational programmes together with increased importance for curriculum improvements that further promote knowledge and awareness of Diabetic ketoacidosis should be initiated for further understanding and benefits.

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