

Gastroparesis in a Patient with Diabetic Ketoacidosis in a First Time Diagnosed Diabetes Mellitus Type I

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Abstract: This case report presents a rare instance of acute gastric dilation complicating diabetic ketoacidosis DKA in a 20-year-old female patient without any significant past medical history. The patient arrived at the emergency department exhibiting symptoms such as difficulty breathing, generalized weakness, atypical chest pain, and severe abdominal pain, leading to the diagnosis of DKA complicated by acute gastroparesis. Laboratory findings revealed hyperglycemia, ketonuria, and acidosis, indicative of severe DKA, along with radiological evidence of gastroparesis. Management included insulin infusion, intravenous fluids, bicarbonate infusion, dietary modifications, prokinetics, and electrolyte correction. The patient's condition improved significantly with these interventions. This case highlights the importance of considering gastroparesis in patients presenting with DKA, as symptoms like nausea, vomiting, and abdominal pain can mask or mimic other gastrointestinal emergencies. Prompt recognition and comprehensive management are crucial for favorable outcomes in such complex cases.

Keywords: diabetic ketoacidosis, gastroparesis, acute gastric dilation, hyperglycemia, emergency management

1. Introduction

Diabetes mellitus Refer to a group of common metabolic Disorder that share the phenotype of Hyperglycemia. Type I DM develops as a result of autoimmunity against the insulin - Producing Beta cells, resulting in insulin Deficiency [1]. Diabetic ketoacidosis (DKA) is the most frequent endocrine emergency. Here a case of DKA complicated with acute gastric Dilation is presented which is one of the rare DKA associated complications. Diabetic gastroparesis is thought to result from impaired neural control of gastric function. Damage to the pacemaker interstitial cells of Cajal and underlying smooth muscle may be contributing factors [2]. Gastro paresis is usually chronic but can present acutely with acute Severe hyperglycemia.

2. Case Report

The 20year old female presented an Emergency Department, C. U. Shah Medical College, Surendranagar with active complaints of difficulty in Breathing, generalised weakness, Atypical chest Pain, perspiration. she also complained about abdominal pain. On presentation, patient was afebrile to 97 Fahrenheit, heart rate of 120 beats per minute, blood pressure

of 108/80 mmhg and oxygen saturation 98% on room air. patient was also suffering from Amenorrhoea since 12 months. Abdominal pain was severe, generalised in location. Abdomen was tense, tender, distended. Kausmaul respiration and a fruity odor on a patient breath was present. Patient also had a severe vomiting which was projectile, non bloody, bilious on nature. patient was Conscious and oriented to time, place and person. she did not have irregular or Bad habits. she didnot passed stool since 1 day.

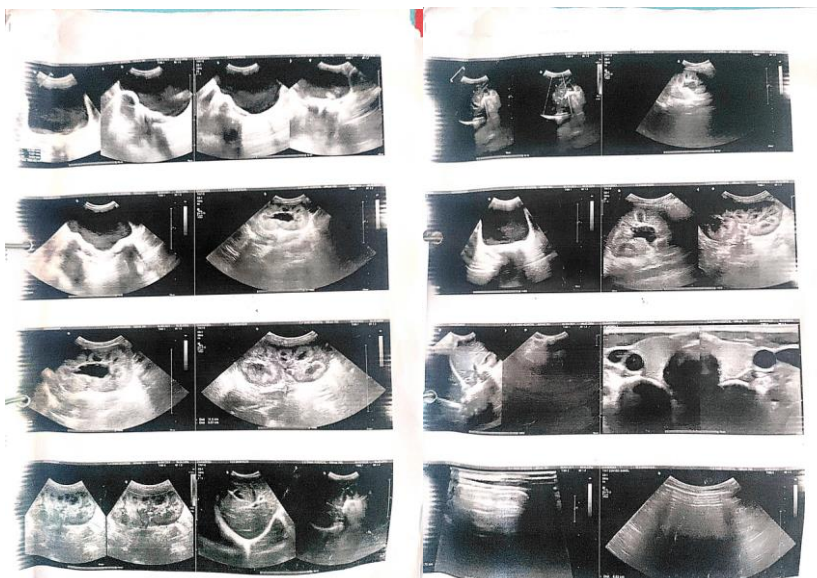
In Laboratory tests, complete Blood Count test shows raised total WBC count, C - Reactive Protein was 56. Random blood sugar was 574 mg/dl. urine sugar shows +3 urine Acetone+4 and urine pus cell occasional. serum Acetone was 20. Serum Amylase 25.90 and Serum Lipase 51.65. HbA1C was 17%.

Her serial Electrolytes were as below:

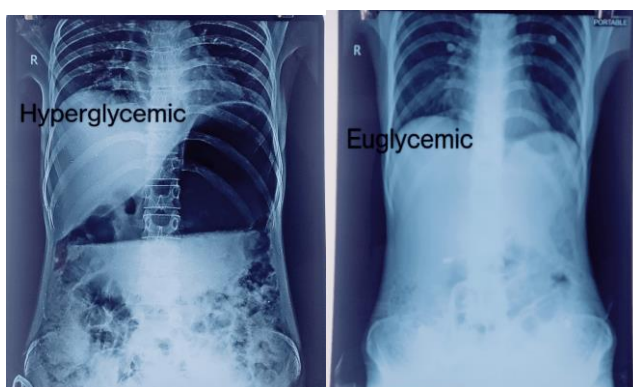
	6/2/24	7/2/24	8/2/24	9/2/24	10/2/24
Na+ (mmol/l)	134.0	151.5	147.2	140.0	140.6
K+ (mmol/l)	4.16	2.02	2.27	2.74	3.5

Patient had urine pregnancy test Negative. Urine Culture shows no organism. Her blood gas Analysis shows: pH - 6.98, p CO₂ - 8.1 Mm Hg, p O₂ - 169 mm Hg, HCO₃ - 1.9 mmol/L, Aniongap 28.3 mmol / L, S0₂ 98.8 % RA.

Ultrasonography revealed, changes of intestinal obstruction, changes of cystitis.



x ray Abdomen standing (AP) shows evidence of air fluid levels in abdomen suggesting picture of obstruction.



3. Discussion

Acute gastroparesis can occur after an acute elevation in the plasma glucose concentration, which can affect gastric sensory and motor function [3] via relaxation of the proximal stomach, decrease in antral pressure waves, and increase in pyloric pressure waves. Patient with diabetic ketoacidosis can

present with Symptoms similar to those of gastroparesis, including nausea, vomiting and abdominal pain [4]. But acute gastroparesis can co exist with diabetic Ketoacidosis, as in our patient, and the gastroparesis can go undiagnosed, since imaging studies are not routinely done for diabetic Ketoacidosis unless there is another reason - as in our patient. The diagnosis usually requires a high level of suspicion in patients with nausea, vomiting, fullness, abdominal pain, and bloating; exclusion of gastric outlet obstruction by a mass or antral stenosis; and evidence of delayed gastric emptying. In our patient, gastroparesis was diagnosed on the basis of the clinical Symptoms and radiological evidence.

Our Patient was managed with Insulin infusion along with Iv Fluids and bicarbonate Infusion. She was treated with higher antibiotics, with better glycemic control, dietary modification, pro kinetics (METOCLOPRIMIDE, LEVOSULPRIDE), keeping patient on nil by mouth, correction of electrolytes. The following days, her Symptoms had Significantly improved, her abdomen was less distended, her bowel sounds had returned and her plasma glucose levels were in normal range. The nasogastric tube was removed after she started to have bowel movements, she was given liquids by mouth.

Here are some case reports of Diabetic Gastroparesis And their treatment (5):

Author	No. of Subjects	Comorbidity	Management	Outcome	length of study
Perkel et al, 1979	24	Diabetic Gastroparesis	Metoclopramide 10mg QID	Improved symptoms by 29%	3 weeks
Snape et al, 1982	20	Diabetic Gastroparesis	Metoclopramide 10mg QID	Improved symptoms by 56%	3 weeks
Abell et al, 2002	38	Diabetic Gastroparesis	Gastric electric stimulation - high frequency low amplitude	Symptoms improved in 33 out of 38 patients	11 months
Arts et al, 2003	20	Diabetic Gastroparesis	Botulinum toxin 100unit in pyloric sphincter	symptoms improved by 29% in 1 month	1 month
Samson et al	12	Diabetic Gastroparesis	Erythromycin 250mg Tid	No overall improvement in symptoms	2 weeks
Skale et al, 2002	11	Diabetic Gastroparesis	Gastric electric stimulation - high frequency low amplitude	symptoms improved in 6 of 11 patients	6months
erbas et al, 1993	13	Diabetic Gastroparesis	Erythromycin 250mg Tid	symptoms improved in 11 of 13 patients by 75%	3 weeks

4. Conclusion

Diabetic ketoacidosis Symptoms Can mask acute gastro paresis, as Imaging studies are not routinely done. Gastro paresis is usually chronic but can present acutely with acute Severe hyperglycemia. Gastrointestinal motor function Is affected by plasma glucose levels and can change over brief intervals. In a patient having gastro paresis, prevent hypokalaemia for that keep Serum potassium level at around 4.0 mmol / L and Keep patient in Euglycemic state. Acute gastro paresis caused by diabetic Keto acidosis can resolve promptly with tight control of plasma glucose levels, anion gap closing and nasogastric tube placement. Careful assessment of abdominal pain should not be overlooked during the management of patient with DKA.

5. Summary

This case report presents a rare instance of acute gastric dilation complicating diabetic ketoacidosis DKA in a 20 - year - old female patient without any significant past medical history. The patient arrived at the emergency department exhibiting symptoms such as difficulty breathing, generalized weakness, atypical chest pain, and severe abdominal pain, leading to the diagnosis of DKA complicated by acute gastroparesis. Laboratory findings revealed hyperglycemia, ketonuria, and acidosis, indicative of severe DKA, along with radiological evidence of gastroparesis. Management included insulin infusion, intravenous fluids, bicarbonate infusion, dietary modifications, prokinetics, and electrolyte correction. The patients condition improved significantly with these interventions. This case highlights the importance of considering gastroparesis in patients presenting with DKA, as symptoms like nausea, vomiting, and abdominal pain can mask or mimic other gastrointestinal emergencies. Prompt recognition and comprehensive management are crucial for favorable outcomes in such complex cases.

Declaration of Patient Consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

References

- [1] <https://www.mhprofessional.com/medical/harrisons-principles-of-internal-medicine>
- [2] Parkman HP, Hasler WL, Fisher RS, American Gastroenterological Association. American Gastroenterological Association technical review on the diagnosis and treatment of gastroparesis. *Gastroenterology* 2004; 127 (5): 1592–1622. pmid: 15521026 <https://www.ccjm.org/content/86/4/238#xref-ref-1-1>
- [3] Fraser RJ, Horowitz M, Maddox AF, Harding PE, Chatterton BE, Dent J. Hyperglycaemia slows gastric emptying in type 1 (insulin - dependent) diabetes mellitus. *Diabetologia* 1990; 33 (11): 675–680. pmid: 2076799

- [4] Malone ML, Gennis V, Goodwin JS. Characteristics of diabetic ketoacidosis in older versus younger adults. *J Am Geriatr Soc* 1992; 40 (11): 1100–1104. pmid: 1401693
- [5] <https://www.gastrojournal.org>