A 34-year-old, fit Caucasian woman with no previous medical or surgical illness, presented to A&E with a sudden onset of several episodes of projectile vomiting unrelied by simple measures and associated with chest discomfort, breathlessness and headache. Initial evaluations showed high blood glucose 26mmol/L, blood pressure 110/65mmHg, pulse 112/min regular, respiratory rate 26/min, SPO2 100% on room air and temperature 37°C; she was found to have blood ketones of 4.2mmol/L, metabolic acidosis with pH 7.29, HCO3 -11, CO2 4.3, O2 11.3, base excess -12, and lactate 1.2.

She was diagnosed with diabetic ketoacidosis (DKA) and was managed as per local standard DKA protocol. Pneumomediastinum (air in the mediastinum) was first described by Laennec in 1819. Hamman described spontaneous pneumomediastinum as a different entity in 1939. Subsequently, this entity was named ‘Hamman’s sign’. Spontaneous pneumomediastinum, Hamman’s syndrome, occurs due to rupture trauma. Spontaneous or primary pneumomediastinum may result from many factors such as direct chest trauma, oesophageal rupture or barotrauma. Spontaneous or primary pneumomediastinum occurs due to rupture of alveoli when there is an increase in the intrapleural volume with a dramatic increase in intrapleural pressure due to sneezing, coughing, vomiting and Valsalva manoeuvres.

The incidence of this complication in diabetes is rarely reported. In DKA, hyperventilation due to acidosis and severe vomiting due to ketosis cause changes in the intra-alveolar pressure gradient in the lungs. The rise in the intra-alveolar pressure leads to rupture of alveoli and subsequently dissection of air escaping alongside the perivascular sheaths into the mediastinum. Air collection can develop at different anatomical sites depending on the site of alveolar rupture and present in different ways. Sub-pleural alveolar rupture causes pneumothorax and subcutaneous emphysema. Rupture seen adjacent to bronchovascular sheaths causes pneumomediastinum and/or pneumopericardium. Ruptured alveolar gas from posterior mediastinum can pass through the intervertebral foramina into the epidural space causing epidural pneumatoisis.

Chest pain/discomfort is the common presenting symptom in pneumomediastinum. Other symptoms include mild dyspnoea, odynophagia, palpitations, anxiety, subcutaneous emphysema etc depending on the site of air collection. Clinical signs depend on the site of air leak. In pneumomediastinum, a bubbling or crackling sound in the thorax heard on auscultation with cardiac systolic sounds is named ‘Hamman’s sign’.

Diagnostic investigation depends on the clinical presentation and differential diagnosis. Lateral view chest X-ray is the initial test but CT thorax is the gold standard as it can also rule out mediastinitis or oesophageal rupture. Oesophagogram can be used if Boerhaave’s syndrome is suspected and the patient is alert. However, OGD or CT thorax can be considered if the patient is comatose. It is always necessary to avoid endoscopy until perforation is ruled out.

Spontaneous pneumomediastinum in DKA is a benign condition and treatment directed towards pneumomediastinum per se is unnecessary unless the patient develops tension pneumothorax. However, correction of metabolic abnormality due to DKA is crucial and pneumomediastinum resolves on its own.

Hamman’s syndrome can also occur in pregnant diabetic patients presenting with DKA. Close observation is essential and appropriate surgical intervention may be needed depending on the presentation. If found during labour, it is crucial to avoid hypoxia and hence fetal monitoring is imperative. It is suggested that shortening the second stage of labour with instrumental delivery is essential to prevent increased mediastinal pressure. If caesarean section is essential, an epidural needs to be considered and general anaesthesia avoided.

Awareness of this complication of DKA could have avoided unnecessary investigations in our patient who was very stable. She received treatment for DKA as per the DKA protocol and her chest symptoms resolved within 24–48 hours. She was discharged home with diabetes management.

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