**Title:** “**What do you “C” in DKA?” - A case of Diabetic ketoacidosis mimicry following intravenous Vitamin C and Glutathione.**

**Aim:**  
To highlight a diagnostic pitfall that may cause misdiagnosis of diabetic ketoacidosis (DKA) in patients recently given intravenous vitamin C.

**Results:**  
A 36-year-old woman presented with a seizure during an infusion of ascorbic acid (15 g) and glutathione for cosmetic purposes. Point-of-care testing showed high glucose and ketones (6 mmol/L). Venous blood gas confirmed metabolic acidosis with glucose 15.9 mmol/L. Laboratory plasma glucose (Abbott Architect) was 15.5 mmol/L, and β-hydroxybutyrate (Roche Cobas) was 5.0 mmol/L. The DKA protocol was utilised until acidosis resolved.

Our biochemistry department confirmed analytical interference from high-dose vitamin C with point-of-care glucose and ketone measurements, and with some lab assays involving enzymatic reactions. While vitamin C interference in glucose testing is known,1-3 its effect on ketone measurement has not been previously studied.

We conducted an experiment to assess vitamin C interference across multiple glucose and ketone testing platforms; results from spiked serum/plasma at varying concentrations are shown in Table 1.

**Conclusion:** This case demonstrates the need to consider alternative causes for hyperglycaemia and elevated ketones in atypical presentations or recent intravenous vitamin exposure. It highlights a potential diagnostic pitfall and a possible contraindication for intravenous vitamin C in diabetic patients needing accurate glucose monitoring.

**Table 1: Comparison of glucose and ketone measurements in vitamin C spiked serum.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Vitamin C mg/L** | **Glucose (mmol/L)** | | | | **Ketones (mmol/L)** | |
| **Glucometer** | | **Blood gas analyser** | **Abbott**  **Architect** | **Glucometer** | **Beta-Hydroxybutyrate** |
| ***Freestyle Optium Neo*** | **Accu-Chek (Roche)** | ***Freestyle Optium Neo*** | ***Roche Cobas*** |
| **0** | 5.20 | 4.20 | 4.20 | 4.20 | 0.00 | 0.01 |
| **100** | 5.40 | 4.40 | 4.40 | 4.17 | 0.30 | 0.20 |
| **200** | 7.00 | 4.50 | 4.40 | 4.17 | 1.00 | 0.58 |
| **500** | 12.8 | Error 12\* | 4.50 | 4.17 | 5.20 | 2.16 |
| **1000** | 18.8 | Error 3\*\* | 4.40 | 4.22 | 7.40 | 4.16 |
| **2000** | High | Error 3\*\* | 4.50 | 4.25 | High | 8.14 |
| **3000** | High | Error 3\*\* | 4.40 | 4.20 | High | 12.1 |

\* Error 12: “The blood sample may contain a high level of Ascorbate”.4

\*\* Error 3: “meter or a test strip error has occurred. In rare cases, an E-3 message may indicate that your blood glucose is extremely high and above the system’s measuring range.”4.

**References:**

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3. Orija IB, Zahid SH. Pseudohyperglycemia secondary to high-dose intravenous vitamin C managed as diabetic ketoacidosis: an endocrinological catastrophe. *AACE Clin Case Rep*. 2021;7:239–42.
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