**Introduction**

GOLDMARK – the mnemonic, which gained popularity since the publication of a landmark article in Lancet, has been used to define the major causes of Anion gap metabolic acidosis (AGMA). The purpose of this case report is twofold:

1. We propose adding “S” (Sodium Thiosulphate - STS) to GOLDMARK.
2. To make clinicians aware of the adverse effects of STS during Calciphylaxis treatment.

**Mechanism of Action of STS**

Reduces pain and promotes healing of wounds due to:
- Antioxidative properties via GSH (Glutathione)
- Interference with calcium deposition in adipose and vascular tissue by CaS\(_2\)O\(_3\) (Calcium thiosulphate)
- Vasodilatory effect by \(\text{H}_2\text{S}\) (Hydrogen sulfide)

**Mechanism of STS Induced Metabolic Acidosis**

Possible mechanisms:
- Formation of thiosulphuric acid in vivo.
- Excess of Hydrogen sulfide can lead to extreme lactic acidosis via inhibition of mitochondrial ATP production. \(\text{H}_2\text{S}\) is cleared renally and thus concern for metabolite buildup is high in ESRD.

**Hospital Course**

Clinical presentation was most consistent with Calciphylaxis.

- Wound care, Antibiotics (later discontinued) and Warfarin was discontinued due to contraindication in CUA.
- Hyperphosphatemia managed with Sevelamer, hyperparathyroidism with Cinalcet with a goal PTH of 150 - 300.

Initiated on STS 25 g IV thrice weekly. After 2 doses of STS – Anion Gap Metabolic Acidosis was directly correlated with STS initiation, prompting dosage reduction to twice weekly.

- Sodium bicarbonate was initiated to counteract acidosis and had to be titrated up to the maximum allowed dose with subsequent resolution of anion gap.
- Due to clinical improvement, STS was continued and patient was discharged to rehab with careful monitoring of anion gap.

**Discussion**

- Calciphylaxis, also called Calcific Uremic Arteriolopathy (CUA), is a rare but serious manifestation characterized by painful skin lesions, often not exclusively seen in ESRD.
- STS, known mainly as an antidote for cyanide toxicity, is increasingly being used for treating CUA.
- Long-term use of STS is limited by major adverse effects of AGMA seen in some patients, which can be easily managed by concurrent Sodium bicarbonate administration.

**Conclusion**

Addition of “S” to GOLDMARK has been suggested earlier as well. We recommend to make this change to increase awareness among clinicians about this severe and life-threatening adverse effect of STS, given it’s becoming standard of care therapy in CUA patients.

References:
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3770999/
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