Sodium Thiosulfate in Calciphylaxis (Calcific Uremic Arteriolopathy)

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Sodium thiosulfate (STS) has been approved by the US-FDA as an antidote for cyanide poisoning and for prophylaxis of cisplatin nephropathy. (1) STS has calcium-chelating property and antioxidant effect. Therefore, it has been used as an off-label drug for the treatment of calciphylaxis – a condition affecting vascular calcification and cutaneous necrosis. Symptoms include pain and erythematous lesion on the affected skin, then the development of plaque with livedo reticularis pattern, intense pain and necrotic tissue. It can be superimposed by bacterial infection, resulting in septicemia. Apart from local wound care, there is no approved treatment for such condition. (2) Multiple interventions have been proposed, such as intensifying dialysis; decreasing serum calcium and phosphorus; avoidance of warfarin, calcium-based phosphorous binders, and vitamin D analogs; parathyroidectomy; and hyperbaric oxygen.

In 2004, the first successful treatment of calciphylaxis by STS was reported by Cicone et al. (3) There has been an incremental use of STS in calciphylaxis; however, standard doses and optimal duration of STS have not been harmonized. Several studies reported the intravenous administration of 25 g of STS three times weekly over 30-60 minutes. The reported duration ranges from 6 weeks to 34 months. (4) According to Micromedex, STS is considered safe with no black box warning. Adverse effects include GI symptoms, hypotension from rapid infusion, and metabolic acidosis. Because each 25 g of STS in 100 mL of normal saline contains 4.8 g of sodium, serum sodium level should be monitored. In the past 5 years, the successful treatment with intra-lesional STS injection was reported. This method can reduce the deleterious adverse effects. (5)

In conclusion, STS is a novel treatment for calciphylaxis used in combination with other treatment modalities. This drug is considered safe and effective. Nevertheless, further studies are needed to demonstrate beneficial effects and clinical application of this drug in real-world practice.

References

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