

Use of Hydrocortisone, Vitamin C, and Thiamine to Treat Burn Sepsis: A Case Series

**A cure for burn sepsis...or,
Too good to be true?**

What do you do when standard of care is not enough?

Introduction

With sepsis remaining one of the most common complications affecting morbidity and mortality in burn patients, it is reasonable to consider novel treatments as adjuncts to standard of care. The bundled use of vitamin C, hydrocortisone, and thiamine has purported positive outcomes in intensive care patients diagnosed with systemic sepsis. However, to our knowledge, evaluation of this treatment modality has not been applied to burn patients.

Patient Characteristics and Outcomes

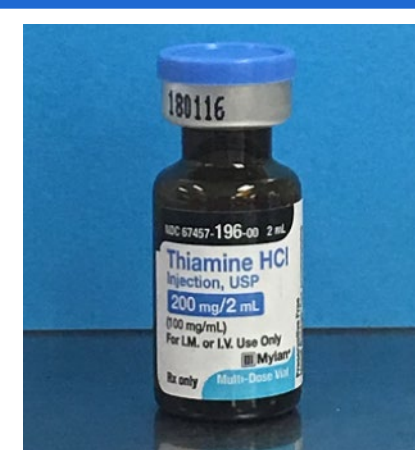
	Age	%TBSA	BAUX	SOFA start	SOFA f/u	LOS	Dispo
1	57	24%	2.1%	≥95.2%	50%	60 days	Lived
2	68	46%	80.6%	≥95.2%	≥95.2%	24 days	Died
3	74	46%	80.6%	≥95.2%	≥95.2%	5 days	Died
4	19	NA	Road rash	≥95.2%	≤33.3%	60 days	Lived
5	29	90%	TENS	≥95.2%	NA	6 days	Died
6	51	38%	2.1%	50%	≤33.3%	28 days	Died
7	37	38%	11.4%	≥95.2%	≤33.3%	85 days	Lived

Vitamin C 1.5g q6h IV



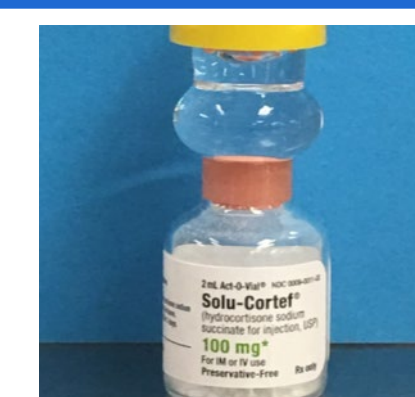
- Antioxidant blocks reactive oxygen species
- Prevents depletion of glutathione and vitamin E
- May increase vasomotor response by increasing endogenous synthesis of norepinephrine and vasopressin

Thiamine 200mg q12h IV



- Thiamine deficiency common in sepsis
- Protects against conversion of glyoxylate to oxalate to limit AKI
- Promotes oxidation of glyoxylate to CO₂
- Theoretically reduces risks associated with vitamin C

Hydrocortisone 50mg q6h IV



- Assumed synergism with vitamin C
- Acts on multiple sites of the inflammation cascade
- Facilitates uptake of vitamin C into cells by restoring cytokine-induced down regulation of vitamin C transporters

Population and Results

Chart review of seven patients with major cutaneous injuries admitted to the burn center and treated with the adjunct therapy occurred.

Five patients sustained flame burns ranging from 24% to 46% total body surface area. One patient was admitted with road rash. One patient was admitted with toxic epidermal necrolysis - 90% total body surface area.

Age ranged from 19 to 74 years.

BAUX score used for baseline mortality.

Four of the seven succumbed to injuries, two within the first week of injury. Of the remaining cases, all required fewer vasopressors after beginning adjunct therapy. Among survivors, SOFA scores suggested 95.2% mortality at start of adjunct therapy and within four days ranged from ≤33.3% to 50%.

Lessons Learned

- Continued research must be conducted to support correlation between treatment interventions and outcomes.
 - Optimism based upon early non-burn studies.
 - A recent RCT did not show a benefit.
- We will continue to evaluate our burn center's experience.

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