



ORIGINAL RESEARCH PAPER

General Surgery

A STUDY ON IMPROVED PATIENT OUTCOMES IN SEPTIC SHOCK WITH USE OF HYDROCORTISONE

KEY WORDS:

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ABSTRACT

- Management of sepsis is a time critical procedure; the consequences of improperly managed sepsis and septic shock can cause multiple organ dysfunction and death. The aim of this study was to evaluate of the role of hydrocortisone.
- Sepsis is defined as life-threatening condition causing multi-organ dysfunction by a dysregulated host response to infection. Septic shock is a subset of sepsis with circulatory and cellular or metabolic dysfunction associated with a higher risk of mortality .
- Sepsis is said to effect the hypothalamic pituitary adrenal axis, causing a relative adrenal insufficiency resulting in cardiovascular instability, metabolic disorders, and a sustained pro-inflammatory state.
- The role of pro-inflammatory pathways suggests a potential use for corticosteroids as an adjuvant therapy in the treatment of sepsis and septic shock . The Surviving Sepsis campaign guidelines recommend that if adequate fluid resuscitation and vasopressors have not restored the hemodynamic stability, it was postulated in limited data to use inj hydrocortisone 100mg i/v 8 hourly for 7 days .
- There was an improvement in the overall survival and reduction in the mortality and morbidity of patients, as observed by early weaning off from vasopressor support, reduction in total leucocyte counts and

Aims and Objective-

The aim and objective of this study was to determine the role of steroid in IV fluids and vasopressor-resistant sepsis patients, its mortality benefits and impact on the length of hospital stay.

Methods-

- This was an observational study done in our department on patients of septicemia due to surgical cause admitted in the ICU , who were on ionotropic support in form of noradrenaline and vasopressin and were in volume replete shock resistant to ionotropic support .
- The study sample size was 20 patients, duration was 6 months and the parameters were the - TOTAL LEUCOCYTE COUNT (before and after initiation of steroid therapy), TIME PERIOD TO WEAN OFF FROM VASOPRESSOR SUPPORT AND THE LENGTH OF ICU STAY.

Inclusion Criteria-

- Surgical patients between the age group of 18-60 years
- Patients having septic shock that is vasopressor resistant
- Not associated with any other medical comorbid condition that would confound the morbidity .

Exclusion Criteria-

- Patients younger than 18 or older than 60 years
- Patients having medical comorbid conditions , thus confounding with the morbidity and mortality.

Results-

It was observed that the patients receiving low dose corticosteroid in the form of hydrocortisone 100mg i/v 8 hourly for a period of 7 days, had significant improvement in the total count levels within the normal range and had an effect of bringing out the patient from septic shock with reduced stay in the ICU and early weaning off from vasopressor and ventilatory support with early discharge.

In our study, out of the 20 patients, we faced with mortality of only 4 patients, with the remaining 16 patients being weaned

off effectively from vasopressor support and shifted to ward .

Conclusion-

Low dose Hydrocortisone therapy can be started in patients with volume replete vasopressor resistant septic shock patients with improved patient outcomes.

DISCUSSION – SEPTIC SHOCK

It is a potentially fatal medical condition that occurs when sepsis, which is organ injury or damage in response to infection, leads to dangerously low blood pressure and abnormalities in cellular metabolism. Frequently, people with septic shock are cared for in intensive care units. It most commonly affects children, immunocompromised individuals, and the elderly, as their immune systems cannot deal with infection as effectively as those of healthy adults. The mortality rate from septic shock is approximately 25–50%.

Septic shock involves a widespread inflammatory response that produces a hypermetabolic effect. This is manifested by increased cellular respiration, protein catabolism, and metabolic acidosis with a compensatory respiratory alkalosis.

Septic shock is diagnosed if there is low blood pressure (BP) that does not respond to treatment. This means that intravenous fluid administration alone is not enough to maintain a patient's BP. Diagnosis of septic shock is made when systolic blood pressure is less than 90 mm Hg, a mean arterial pressure (MAP) is less than 70 mm Hg, or a systolic BP decrease of 40 mm Hg or more without other causes for low BP. Septic shock is a subclass of distributive shock, a condition in which abnormal distribution of blood flow in the smallest blood vessels results in inadequate blood supply to the body tissues, resulting in ischemia and organ dysfunction. Septic shock refers specifically to distributive shock due to sepsis as a result of infection.

Septic shock may be defined as sepsis-induced low blood

pressure that persists despite treatment with intravenous fluids.

HYDROCORTISONE-

Hydrocortisone is a corticosteroid, acting specifically as both a glucocorticoid and as a mineralocorticoid. That is, it is an agonist of the glucocorticoid and mineralocorticoid receptors. Hydrocortisone has low potency relative to synthetic corticosteroids.

There is now ample evidence that the inability of the host to mount an appropriate hypothalamic-pituitary and adrenal axis response plays a major in overwhelming systemic inflammation during infections. Proinflammatory mediators released in the inflamed sites oppose to the anti-inflammatory response, an effect that may be reversed by exogenous corticosteroids.

Corticosteroids restore

1. Cardiovascular homeostasis-

- Corticosteroids induce sodium retention via both mineralocorticoid and glucocorticoid receptors. Thereby, corticosteroids will contribute to correct the hypovolemia that characterizes the early phase of sepsis.
- In addition, by favoring sodium and water accumulation in blood vessels' wall, corticosteroid will contribute to increase systemic vascular resistance

2. Reduce ICU stay, terminate systemic and tissue inflammation, restore organ function, and prevent death by-

- Corticosteroids may both prevent organ failure and reduce the intensity and number of organ dysfunction by reducing tissue inflammation and triggering tissue repair and by improving tissue perfusion
- Corticosteroids have been shown to suppress renal iNOS activity after endotoxemia to prevent hypoxic injuries to the cortex, to improve renal oxygen delivery, and finally to restore renal oxygen consumption and hence prevented the renal shutdown associated with the septic shock.
- The favorable effects of corticosteroids on organ perfusion also have been shown for the heart and brain
- A meta-analysis of five randomized trials demonstrated a strong reduction in the SOFA score at 1 week after randomization.
- Because patients treated with corticosteroids are rapidly weaned off vasopressor therapy and mechanical ventilation, they are discharged much earlier from the intensive care unit.

CONCLUSION-

Hence from the above discussion , it can be proven that low dose hydrocortisone , initiated early during the course of treatment of vasopressor resistant septic shock, has improved patient outcome and is an effective weapon in the armoury of surgeons.