Old wine, old bottle, new customer

NEW(S)

The cheap injection that might be able to save a soldier's life.

It has been roughly estimated that it would take about 4 h for injured soldiers to receive a blood transfusion at a hospital. Researchers at Massachusetts General Hospital wondered whether histone deacetylase (HDAC) inhibitors could counter and prevent organ failure in instances of rapid blood loss. Pigs were divided into three groups and were drained of 60% of their blood. Group 1 received saline infusion, group 2 received valproic acid (HDAC inhibitor) injection, and group 3 blood transfusion. Survival at the end of 4 h was 25%, 86%, and 100%, respectively. A similar effect in humans by valproic acid

can buy time drastically in soldiers who have suffered massive blood loss till blood transfusion is available.[1]

(RE)VIEWS

It has been previously shown that valproic acid, an HDAC inhibitor, can improve survival in lethal models of hemorrhagic shock.[2]

Usage of corticosteroids as a therapy for numerous forms (e.g., septic, hypovolemic, traumatic, cardiogenic, etc.) of circulatory shock is well known, though the mechanism is unclear. Corticosteroids suppress the multiple inflammatory genes that are activated in asthmatic airways mainly by reversing histone acetylation of activated inflammatory genes.[3] A preliminary clinical trial has indicated that the broad spectrum HDAC inhibitor, valproic acid, has potent antiasthmatic activity.[4]

Whether corticosteroids as well as valproic acid affect the same HDAC to bring out the beneficial effects in shock is not known.

Ironically, there are case reports implicating valproic acid in the causation of shock.[5,6]

Recently in rat models, a serum protein called claudin-3 has been shown to be elevated with a concurrent decrease in intestinal claudin-3 levels in hemorrhagic shock. These alterations were reversed by valproic acid treatment. In this study, claudin-3 has been suggested as a potential biomarker in hemorrhagic shock and its treatment.[7]

Whatever may be the mechanism, if valproic acid is shown to enhance survival time in hemorrhagic shock in humans, then it would occupy a status in the "must have drugs list" in the emergency department.

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