Effects of Steroidal Therapy on the Incidence of Ventilator-Associated Events in a Northwestern Ohio Hospital

Nawaf Almeshal MD* Talia Tarazi William Barnett MS Aahd Kubbara MD Wail Alamoudi MBBS Reyna Altook MBBS Rasha Nakity MBBS Asif Iqbal MD Ajit Ramadugu Shahnaz Rehman MD Fadi Safi MD and Ragheb Assaly MD
University of Toledo, Toledo, OH

PURPOSE: Corticosteroids are commonly administered in critically ill patients for a variety of reasons. They were estimated to be used in about 26% of critically ill patients. Controversies have always surrounded their outcomes in the ICU. While they have been shown to increase death in Intensive Care Unit - acquired pneumonia, they have been proposed to prevent hospital acquired pneumonia in intubated patients with multiple trauma. In the Society of Critical Care Medicine guidelines, it was recommended to consider hydrocortisone treatment for patients with septic shock with no mortality benefit. Herein, we present a sample of an ongoing analysis of the use of hydrocortisone and the risk of Ventilator Associated Events compared to other steroids in our university hospital. Ventilator Assoctiated Events (VAE) defined by the CDC National Healthcare Safety Network developed in 2013.

METHODS: The dataset consisted of a sample of 858 mechanically-ventilated patients. According to hospital surveillance records, 152 patients met CDC-defined criteria for a VAE. Dexamethasone, methylprednisolone, prednisone, and hydrocortisone usage during the intubation period was also collected among each group. The data was analyzed using Chi-square statistics and an alpha level of 0.05 was considered statistically significant.

RESULTS: Of the total 858 patients, 706 were in the non-VAE group. Of those, 62 (8.8%) patients received dexamethasone, 133 (18.8%) where treated with methylprednisolone, 72 (10.2%) with prednisone and 68 (9.6%) patients with hydrocortisone. In the VAE group (N=152), the numbers where as follows: 14 for dexamethasone (9.2%), 39 for methylprednisolone (25.7%), 16 for prednisone (10.5%) and 41 for hydrocortisone (27%). Only hydrocortisone treated group showed a significant relationship in regards to the development of VAE (X² = 33.9, P < 0.001). No statistical significance was noted with the other steroids. The was no difference in the SOFA score or the pressor use among all steroid groups including hydrocortisone group.

CONCLUSIONS: Postulations behind the lack of favor of hydrocortisone could include the weaker anti-inflammatory of this steroid when compared to others. Also, patients who need hydrocortisone therapy would be generally more critically ill so the need of hydrocortisone therapy could implement a negative prognostic factor for the development of VAE. However, in our analysis the SOFA score and vasopressor use were similar among all groups.

CLINICAL IMPLICATIONS: In our study we found that the use of hydrocortisone was significantly higher in the VAP population. This can be related to hydrocortisone being the steroid of choice in septic & adrenally insuffecient patients. Albeit hydrocortisone’s immunosuppressive potency is lower compared to its peer steroids, this doesn’t seem to play a major role when it comes to VAE in our population.

DISCLOSURE: The following authors have nothing to disclose: Nawaf Almeshal, Talia Tarazi, William Barnett, Aahd Kubbara, Wail Alamoudi, Reyna Altook, Rasha Nakity, Asif Iqbal, Ajit Ramadugu, Shahnaz Rehman, Fadi Safi, Ragheb Assaly

DOI: http://dx.doi.org/10.1016/j.chest.2016.08.328
Copyright © 2016 American College of Chest Physicians. Published by Elsevier Inc. All rights reserved.