

514 **The Outcomes of Tracheostomy on Burn Inhalation injuries**

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Introduction: Tracheostomy has been proposed for patients with expected prolonged intubation and it has been shown to be beneficial for trauma patients with severe brain injury; however, the benefit of performing tracheostomy on burn inhalation injuries has not been extensively investigated. Our study aims to determine the outcomes of performing tracheostomy on patients with burn inhalation injuries requiring mechanical ventilation.

Methods: Retrospective review of our institutional burn registry from 2011 to 2019. We compared the outcomes of all burn patients that met our inclusion criteria which included: adequate data recording of inhalation injury within the registry, ventilator support for at least 24 hours, and a TBSA burn injury of < 15%. We stratified the patients into two groups: tracheostomy (group 1) versus no tracheostomy (group 2). Outcome measures included: in-hospital mortality rate, hospital length of stay, ICU length of stay, ventilator days, and ventilator associated pneumonia (VAP). Chi-squared and t-test analyses were used with significance defined as $p < 0.05$.

Results: A total of 33 burn patients met our inclusion criteria. Group 1 consisted of 10 patients and group 2 consisted of 23 patients. There was no statistically significant difference between the two groups in terms of %TBSA ($p = 0.24$, t-test). There was a significantly higher ICU length of stay at 23.8 days in group 1 compared to 3.16 days in group 2 ($p = 0.0001$, χ^2). There was a significantly higher hospital length of stay at 28.4 days in group 1 compared to 5.26 days in group 2 ($p = 0.0001$, χ^2). Ventilator days was also significantly higher in group 1 with 20.8 days compared to 2.5 days in group 2. There was no statistically significant difference between the two groups in terms of mortality, however, the incidence of VAP was significantly higher in group 1 than in group 2, with six cases compared to zero cases, respectively ($p = 0.0001$, χ^2).

Conclusions: The ideal timing and implementation of tracheostomy with inhalational injury has yet to be determined. In our study, tracheostomy was associated with much longer lengths of stay and pneumonia. The impact of the underlying lung injury, versus the tracheostomy itself on these observations, is unclear. The challenge of characterizing the severity of an inhalation injury based on early visual inspection remains.

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515 **Deficiencies of Rule-based Technology generated Antibigrams and Application in Patients with Prolonged Lengths of Stay**

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Introduction: Antibigrams are unit specific annual reports of cumulative pathogen incidence and antibiotic susceptibilities, used to guide selection of empiric antibiotic therapies. Rule-based technology (RBT) expedites data compilation, but follows "first pathogen, per patient" and limits applicability, especially for prescribing antibiotics in units with higher lengths of stay. The objective was to compare the pathogens and susceptibilities of the current automated RBT antibiogram with one manually collected through chart review with additional rules applied.

Methods: This is a single-center, retrospective cohort study utilizing chart review to assess patients admitted to the Burn Center between January 2018 and December 2019 from whom significant bacterial cultures were obtained. Demographics and burn injury characteristics were collected. Treatment data related to the infection and antibiotic usage was also collected. Specific to the culture, timing, site, pathogen, and sensitivity were collected. All cultures within the first 30 days of admission were included. The current RBT antibiogram served as the control. And new antibiogram versions were created using additional rules and compared to the RBT antibiogram.

Results: During the 2 years, 657 patients were admitted. Two-hundred four patients remained after applicable exclusions. Sixty-one percent were excluded due to lack of cultures. Mean age was 50.6 ± 16.5 years and 66% were male. Forty-nine percent were Caucasian. Seventy-two percent were admitted for an acute burn injury with flame as the primary mechanism and a median percent total body surface area of 10 (3, 21). Fifty-nine percent had at least one hospital acquired risk factor with over one-third having recent illicit drug use and one-third having a recent hospitalization. Of the 410 cultures included, 57% were Gram-negative and half were from wound infections. Sensitivities were significantly different when comparing the RBT to those created from significant cultures within 7 days of admission, cultures within 7 days of admission and without hospital-acquired infection risk factors (Figure 1), and those being treated with an initial or subsequent course of antibiotics. Recommended empiric antibiotic changed from double coverage to a single β -lactam with > 90% susceptibility. The susceptibilities between first and subsequent courses were dramatically different (Figure 2)

Conclusions: The antibiogram was significantly different from the RBT version after including factors, such as days since admission, presence of hospital acquired risk factors, or previous antibiotic courses. Before developing an antibiogram or interpreting the output, it is important to consider which automated criteria are utilized, especially for units with extended lengths of stay.