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Title: Acute renal failure and hemodialysis increases the length of invasive mechanical ventilation, hospital stay and hospital costs in severe polytrauma patients

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Body: Background: Polytrauma, complexes post-surgical states and severe bleeding are conditions associated to higher risk of acute renal failure (ARF). Despite the advances in prevention and treatment this condition, ARF is associated to higher mortality and financial burden on healthcare systems. The aim of this study was to verify the impact of dialytic ARF (d-ARF) in severe polytrauma patients on lengths of invasive mechanical ventilation (length-IMV), hospital stay (length-H) and hospital costs (\$H). Methods: The study was performed in a large public tertiary-teaching hospital from Dec-2009 to Oct-2011. It was selected 198 polytrauma patients, ≥18 years old, ≥24h of IMV. Outcomes of patients who developed d-ARF were compared to the matched non d-ARF. Gender, age, Acute Physiology and Chronic Health Disease Classification System II (APACHE II), number of surgeries, length-IMV, length of intensive care unit stay (length-ICU) and length-H were collected. The \$H was determined by the Omega Score (47 diagnostics and therapeutics items in three categories scored from 1 to 10). The direct cost in Euros (€) was calculated according to Sznajder et al. (1998). Results: Out of 198 patients selected, 21 (10.6%) developed d-ARF. They were older (44vs36 years; p=.049); presented higher number of surgeries (3vs1; p=.002), APACHE II (20vs13; p<.001); length-IMV (14vs8 days; p<.004); length-ICU (29vs16 days; p<.001); and length-H (41vs24 days; p<.0001). Total Omega Score (750vs334; p<.001) and € (159,951vs71,892; p<.001) were higher in d-ARF patients. Conclusions: Polytrauma patients with d-ARF presented higher length-IMV, length-H and \$H.