M Chotalia 1 ; M Bangash 2 ; T Matthews 2 ; D Parekh 2 ; J Patel 2

1University Hospitals Birmingham, NHS Foundation Trust, Critical Care and Anaesthesia, Birmingham, United Kingdom, 2University Hospitals Birmingham, NHS Foundation Trust, Birmingham, United Kingdom

Introduction:
This study analyses the prognostic ability of noradrenaline dose in the first four days following the onset of septic shock.

Methods:
Patients with a diagnosis of septic shock (Sepsis 3.0) admitted to the ICU at Queen Elizabeth Hospital, Birmingham between April 2016 and July 2019 were included. The primary outcome was 90-day mortality. Continuous data is presented as mean (SEM). Categorical data is presented as % and analysed using a chi-squared test. A p value of <0.05 was used to determined significance. To allow for multiple comparison between data, a Bonferroni calculation was used to determine significance at a p value of <0.01. Receiver operator characteristic (ROC) curves were generated for noradrenaline dose and area under the curve (AUC) was calculated.

Results:
847 patients were admitted with septic shock. The majority (61%) were male, with a mean age of 62 (±0.6) and a 90-day mortality of 43%. Median noradrenaline dose had a fair prognostic ability on day 1 (AUC = 0.754 [0.714 – 0.794]) and good prognostic ability on day 2 (AUC = 0.844 [0.810 – 0.878]). A noradrenaline dose of 0.25 μg/kg/min on day 1 and 0.15 μg/kg/min on day 2 had a 70% sensitivity and 70% specificity for mortality. Median noradrenaline dose was an excellent prognostic indicator on day 3 (AUC = 0.911 [0.878 – 0.943]) and day 4 (AUC = 0.908 [0.879 – 0.948]). A noradrenaline dose of 0.1 μg/kg/min on day 3 and 0.05 μg/kg/min on day 4 had a 90% sensitivity and 90% specificity for mortality. In patients who survived, vasopressors were weaned off within 4 days in 90% of cases. In those who died, death occurred within 4 days 88% of the time.

Conclusion:
Noradrenaline dose has a good prognostic ability in septic shock. In this septic shock cohort, the majority of patients that died did so within 4 days. Furthermore, the majority of survivors were weaned off vasopressors within 4 days. Therefore, by day 3 and 4, small doses of noradrenaline had an excellent prognostic ability for septic shock.

Image :
Maximum noradrenaline dose (micrograms/kg/minute) from onset to day 4 of septic shock and % 90-day mortality. (**: p = 0.005; ***: p < 0.0001; ns = non-significant)