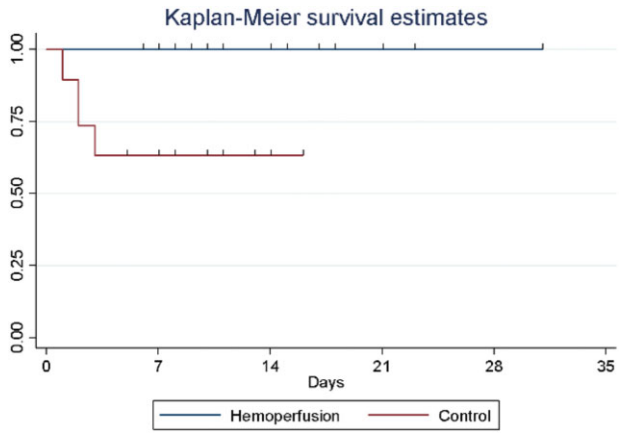

Figure 1: Kaplan-Meier survival estimates: Hemoperfusion vs Control Arm.

#3436

EFFICACY OF ADJUNCT HEMOPERFUSION VERSUS STANDARD MEDICAL THERAPY ON 28-DAY MORTALITY IN LEPTOSPIROSIS PATIENTS WITH RENAL FAILURE AND SHOCK

Danice Romagne Leano, Romina Danguilan, Melhatra Arakama, Eric Chua, Vincent Apelin and Paolo Pinkerton Alamillo

National Kidney and Transplant Institute, Adult Nephrology, Quezon City, The Philippines

Background and Aims: Leptospirosis, a ubiquitous zoonotic infection in the Philippines, is a classic representation of sepsis-induced multi-organ dysfunction with its life-threatening complications: pulmonary hemorrhage, renal and liver failure. Despite pre-established treatment guidelines, leptospirosis-induced morbidity and mortality continue to rise. Hemoperfusion with HA 330 is a promising adjunct therapy as it removes rogue cytokines responsible for the dysregulated inflammatory response in severe sepsis. However, studies on its survival benefit have yielded conflicting results, so far. This study was designed to assess the efficacy and safety of hemoperfusion among leptospirosis patients in septic shock and renal failure, in terms of improvement in 28-day mortality, SOFA score, level of inflammatory markers, hemodynamics, renal and pulmonary function.

Method: This is an open-label randomized controlled trial which enrolled a total of 37 adult presumptive leptospirosis patients with early signs of septic shock and acute renal failure. The study participants were randomized into either of the two treatment arms: 1. standard medical therapy (SMT) alone or 2. SMT + HA330 Hemoperfusion (HP). All patients were managed based on the NKTI Leptospirosis treatment protocol (hydration, antibiotics, three-day steroid pulsing, single cyclophosphamide dose and respective organ support) and were placed on daily intermittent hemodialysis. Subjects randomized to the HP group received three hemoperfusion sessions (on top of SMT). Vital signs, urine output, vasopressor dose, P/F ratio and biochemical parameters (including level of inflammatory markers) of patients from each treatment arm were measured at baseline, day 3 and day 7 and compared subsequently. Monitoring of participants continued until 28 days post-randomization. Descriptive statistics was used to summarize the general and clinical characteristics of the participants. Independent Sample T-test, Mann-Whitney U test, and Fisher's Exact/Chi-square test was used to determine the difference of mean, median and frequency between hemoperfusion group and control group, respectively. Mean, median, or risk difference and their corresponding 95% confidence intervals were calculated. Friedman test or Wilcoxon's signed-rank test were used to determine whether differences between groups were significant over time. Intention to treat and per protocol analyses were performed. Null hypothesis was rejected at 0.05α-level of significance. Stata 15.0 (StataCorp LLC, TX) was used for data analysis.

Results: Hemoperfusion conferred a 36.84% ($p = 0.017$) risk reduction in 28-day mortality. Serial monitoring of inflammatory markers and SOFA score of patients showed significant improvement in sepsis score ($p = 0.018$ HP, 0.002 SMT) and levels of procalcitonin ($p = 0.013$ HP, 0.003 SMT), IL6 ($p = 0.033$ HP, 0.020 SMT) and lactate ($p< 0.001$ HP, 0.021 SMT) in both treatment arms, from baseline to Day 7. There is, however, no statistically significant difference in the change in SOFA ($p = 0.965$) and inflammatory marker levels if we compare HP versus SMT ($p = 0.997$, 0.451, 0.858, 0.052 for hsCRP, procalcitonin, IL6 and lactate, respectively). Statistically significant improvement in serum creatinine ($p = 0.04$) and PF ratio ($p = 0.045$) were observed in the hemoperfusion cohort as early as Day 3. Vasopressor dose did not differ significantly between two groups ($p = 0.792$). No adverse events were observed in both treatment arms.

Conclusion: Hemoperfusion is a safe and effective adjunct therapy in managing severe sepsis. It promotes earlier renal and pulmonary function recovery and, in doing so, improves survival of septic shock patients.