Outstanding Resident Poster #3

Name: Zarychanski, Ryan
Position: Critical Care Resident
Professional Initials: MD FRCPC
Department: Hematology and Critical Care
Institution: University of Manitoba
City: Winnipeg
Province: Manitoba
Country: Canada
Postal Code: R3E 0V9
E-mail:ryan@zarychanski.com

Co Authors name: Ryan Zarychanski, Harleena Gulati, Daniel Roberts, Satendra Sharma, Donald S. Houston, Anand Kumar

Institution Affiliation: Section of Critical Care Medicine,¹ University of Manitoba; and Section of Hematology/Medical Oncology,² University of Manitoba.

SYSTEMICALLY ADMINISTERED HEPARIN IS ASSOCIATED WITH INCREASED SURVIVAL IN PATIENTS DIAGNOSED WITH SEPTIC SHOCK

Ryan Zarychanski,¹ Harleena Gulati,¹ Daniel Roberts,¹ Satendra Sharma,¹ Donald S. Houston,²
Anand Kumar¹

Background: Sepsis and septic shock represent a systemic inflammation state with substantial pro-coagulant elements. Unfractionated heparin (UFH) is a well known systemic anticoagulant that also possesses significant anti-inflammatory properties. Unfractionated heparin therapy has been shown to increase survival in experimental models of septic shock. The objective of this study was to evaluate the potential therapeutic benefit of UFH in a cohort of patients diagnosed with septic shock.

Methods: This retrospective case-matched cohort study involved 788 patients diagnosed with septic shock who were admitted to Winnipeg regional intensive care units (ICUs) from 1989–2004. The study group consisted of 394 patients who received systemic full dose anticoagulation with UFH within 48 hr of admission, and who lived at least 48 hr. Clinically relevant outcomes were compared to 394 matched control patients who received either no heparin or only prophylactic doses, and who survived a minimum of 48 hr in an ICU setting. Patients in each group were matched 1:1 for APACHE II score, site of infection, and time to effective antimicrobial therapy. The primary outcome variables were hospital mortality and 30 days survival. Secondary outcomes included, duration of vasopressor/inotrope therapy, duration of mechanical ventilation, and both hospital and ICU length of stay.

Results: Major baseline patient characteristics were similar in the study and control groups. Administration of therapeutic heparin was associated with a significant reduction in hospital mortality (42.6% *vs* 51.3%, $P = 0.02$). Intensive care unit mortality was similarly decreased. Cox proportional regression analysis demonstrated a sustained survival advantage among patients receiving therapeutic dose heparin over 30 days (hazard ratio 0.72 [95% confidence interval 0.59–0.88], $P = 0.01$).

Conclusion: Early administration of therapeutic dose UFH is associated with decreased mortality when administered to patients diagnosed with septic shock. These findings are both clinically significant, and economically important given the minimal cost of UFH.