### 379: A Model to Predict Duration of Ventilation and 30-Day Mortality in Patients with Traumatic Injuries.

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THE ASSOCIATION OF AGE WITH SHORT-TERM AND LONG-TERM MORTALITY IN ADULTS ADMITTED TO THE ICU

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Learning Objectives: Recent studies have demonstrated that the age of ICU patients is increasing. The significance of this observation is unclear. The literature is mixed on whether advanced age leads to higher mortality or whether it is due to the greater number of comorbidities in the aging population. We hypothesized that increasing age would significantly increase the odds of short-term and long-term mortality after adjusting for comorbidities in patients admitted to the ICU.

Methods: We performed an IRB approved retrospective cohort study of patients aged 18 or older who were admitted to any ICU over a 5-year period (2007 - 2012) at two urban, academic tertiary care centers. Patients were divided into four age groups, 18-39, 40-59, 60-79, and ≥ 80. The primary outcomes were 30-day mortality and 360-day mortality. We used multivariable logistic regression to assess for an association between age group and outcomes adjusting for gender, race, Charlson Comorbidity Index and Elixhauser index. Odds ratios (ORs) and 95% confidence intervals (CIs) are reported. Results: 57,335 patients were analyzed. 42.8% were female and the mean age was 64.2 ± 16.1 years. 30-day mortality was 5.9%, 8.6%, 11.8%, and 17.4% for age groups 18-39, 40-59, 60-79, and ≥ 80 respectively (p < 0.001). 360-day mortality was 13.5%, 20.4%, 27.2%, and 32.8% for age groups 18-39, 40-59, 60-79, and ≥ 80 respectively (p < 0.001). The adjusted 30-day mortality ORs were 1.26 (95% CI 1.10-1.45), 1.57 (95% CI 1.37-1.80), and 2.51 (95% CI 2.17 - 2.91) for age groups 40-59, 60-79 and ≥ 80 respectively, using age group 18-39 as the reference. The adjusted 360-day mortality ORs were 1.11 (95% CI 1.01-1.23), 1.20 (95% CI 1.08-1.32), and 1.50 (95% CI 1.35 – 1.67) for age groups 40-59, 60-79 and ≥ 80 respectively, using age group 18-39 as the reference. Conclusions: We observed an increasing proportion of short-term and long-term death with increasing age after ICU admission. Further study is needed to assess the contribution of age on outcomes in ICU patients.
assessed for associations and examined in stepwise regression models. The primary outcome was total ventilator time (572 hours vs 572 hours); the secondary outcome was 30-day mortality. Receiver operating characteristic (ROC) curves were produced for both outcomes. Data are presented as percentages, median [IQR], and odds ratio (OR; 95% CI). Results: 1308 combat trauma patients (24 years, 98% male) were included: 72% blast, 17% penetrating, 9% blunt, and 2% burns. Pre-flight systolic blood pressure was 121 [109-143] mmHg, pulse 100 [84-116] bpm, and base deficit 0 [-2-2]. The median number of blood products administered pre-flight were 4 [0-3] units packed red blood cells (PRBC), and 3 [0-12] units fresh frozen plasma. When modeling for ventilator time, injury severity score (ISS) (OR 1.04 [1.03-1.06]), pre-flight PRBC units transfused (OR 1.05 [1.04-1.07]), and pre-flight intubated status (OR 11.9 [5.53-16.89]) were independently associated with increased ventilator days. A composite of the variables produced an AUC of 0.85 with 86% sensitivity and 56% specificity. Using mortality as the outcome, ISS (OR 1.06 [1.03-1.09]), prothrombin time (OR 2.13 [1.84-4.47]), pre-flight intubated status (OR 9.2 [1.38-66.11]), and whole blood (OR 3.18 [1.38-7.04]) were associated with death. The combination of variables produced an AUC of 0.84 with 71% sensitivity and 57% specificity. Conclusions: In our large study of critical care aeromedical patients a number of pre-flight variables are a significant predictor of mortality.

380 OUTCOME OF BONE MARROW TRANSPLANTATION IN CHILDREN: AN ANALYSIS OF KID’S INPATIENT DATABASE
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Learning Objectives: Several prognostic scoring systems including APACHE II score have been developed and widely used. However, the accuracy and generalizability is not sufficient. This is partly because these systems evaluate each organ separately although the measured variables used in the scoring systems reflect the interactions of each organ or biological response. We hypothesized that network analysis of the interaction of the measured variables will enable to develop a better prognosis prediction. Methods: Patients 18 years of age or older who had been admitted to our intensive care unit at the University of Tokyo Hospital during 9 months were included. 17 clinical variables were analyzed using network analysis. Variables with high betweenness centrality were detected by calculating Spearman’s rank correlation coefficient, adjusted with Bonferroni correction. Association of the identified variables with high betweenness centrality (“hubs”) with the clinical outcomes were further evaluated by multivariate regression and receiver operating characteristic analysis. Results: NT-proBNP, fibrin/ fibrinogen, hemoglobin, NGAL (a new AKI biomarker), platelet count and serum albumin had significantly high centralities and were identified the “hubs” in the network. The area under the ROC curve (AUC-ROC) of outcome prediction with these 7 variables was significantly higher as compared with that APACHE II score (AUC-ROC=0.911, IQR 0.798-0.964 vs. 0.790, IQR 0.676-0.873, p=0.0491). Conclusions: Network analysis could identify several clinical “hubs” that enable to predict prognosis in critically ill patients with high accuracy.

381 NEW PROGNOSTIC PREDICTION SYSTEM IN CRITICAL CARE BASED ON NETWORK ANALYSIS
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Learning Objectives: Several prognostic scoring systems including APACHE II score have been developed and widely used. However, the accuracy and generalizability is not sufficient. This is partly because these systems evaluate each organ separately although the measured variables used in the scoring systems reflect the interactions of each organ or biological response. We hypothesized that network analysis of the interaction of the measured variables will enable to develop a better prognosis prediction. Methods: Patients 18 years of age or older who had been admitted to our intensive care unit at the University of Tokyo Hospital during 9 months were included. 17 clinical variables were analyzed using network analysis. Variables with high betweenness centrality were detected by calculating Spearman’s rank correlation coefficient, adjusted with Bonferroni correction. Association of the identified variables with high betweenness centrality (“hubs”) with the clinical outcomes were further evaluated by multivariate regression and receiver operating characteristic analysis. Results: NT-proBNP, fibrin/fibrinogen, hemoglobin, NGAL (a new AKI biomarker), platelet count and serum albumin had significantly high centralities and were identified the “hubs” in the network. The area under the ROC curve (AUC-ROC) of outcome prediction with these 7 variables was significantly higher as compared with that APACHE II score (AUC-ROC=0.911, IQR 0.798-0.964 vs. 0.790, IQR 0.676-0.873, p=0.0491). Conclusions: Network analysis could identify several clinical “hubs” that enable to predict prognosis in critically ill patients with high accuracy.

382 PATIENT-SPECIFIC RISK MODEL OF BACTERIAL CO-INFECTION IN CHILDREN WITH SEVERE VIRAL BRONCHIOLITIS
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Learning Objectives: Up to 24% of children hospitalized with viral lower respiratory tract infection (LRTI) will require admission to the intensive care unit. Among children with respiratory failure from LRTI caused by respiratory syncytial virus (RSV), between 17% and 39% will develop pulmonary bacterial co-infection yet nearly all will receive antibiotics. We sought to reduce antibi-otics (COST) in children with LRTI by identifying those patients at low risk of bacterial co-infection through the use of a patient-specific risk model. Methods: Retrospective cohort study of children with laboratory confirmed RSV LRTI requiring mechanical ventilation over a two-year period. Bacterial co-infection was defined using previously published microbiological criteria. Multiple candidate variables were assessed for association with co-infection and potential inclusion in the final model. Model was constructed using a weighted partial correlation method. Model output of risk was assessed using receiver operating curve (ROC) characteristic analysis. Results:Forty-five patients were included in the study; 19 (42%) with bacterial co-infection (four (9%) with probable infection, 15 (33%) with possible infection). Candidate variables associated with co-infection: elevated white blood cells (WBC) for age, Gram stained (GS) WBC and bacteria (both ordinal variables). By partial correlations, weighted values for each model variable were elevated WBC (13%), GS WBC (52%), and GS bacteria (55%). By ROC analysis, optimal model cut-offs correctly classified 94% of patients with an area under the curve of 0.83. Model would have decreased unnecessary antibiotic use in 18-51% of patients. Conclusions: Patients with RSV LRTI at low risk for bacterial co-infection can be identified using mathematical models, potentially decreasing antibiotic overuse. Efforts to expand patient-specific modeling to other respiratory viruses are needed.

383 PATTERN OF HOSPITAL ADMISSIONS AND OUTCOME OF ACUTE ALUMINUM PHOSPHIDE POISONING IN AN INDIAN ICU
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Learning Objectives: Acute aluminum poisoning is a major problem in India. This retrospective study was undertaken to describe the epidemiological features of aluminum phosphide poisoning in all patients who were admitted in Pushpanjali Hospital, Agra, India. The specific objectives included the determination of the age range most vulnerable, the annual pattern of occurrence, the clinical features at the time of presentation, duration and course of ICU stay and the outcome. Methods: Data was extracted from the medical records of 62 patients with aluminum phosphide poisoning admitted between January 2009 and March 2014. Results: 62 patients were admitted for suicidal poisoning. The age ranged from 14 years to 63 years. Females of age group 20 to 35 years accounted for 37 (59.6%) cases. There were 21 males and 41 females with a male: female ratio of 1: 1.8. LOS (78 vs 40 days; p<0.001), had more co-morbid conditions and higher mortality (58% vs. 2.8%; p<0.001). Presence of renal failure increased mortality (39% vs. 5.7%; p<0.001). Most common type of BMT was Allogeneic (47%) followed by autologous (40%) and cord blood (12%). Children with cord blood BMT were younger (7.4 vs. 8.7 yrs.), had HPRDRG extremely high risk of mortality (19%, P<0.001) compared to allogeneic (10%) or autologous (5%), had longer LOS (65 days, P<0.001), and higher mortality (17%, P<0.001). Lowest mortality was seen in autologous group (1.5%). Conclusions: Our study analyzes children who received BMT during a year using a large national data base. Overall hospital mortality of BMT procedure is 6.2% and is higher in patients who received mechanical ventilation, had renal failure or received cord blood.

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