Predictors of mortality from sepsis among an African patient cohort: a prospective study from two tertiary healthcare facilities in Kigali, Rwanda.

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Background

In Rwanda, there is limited information on the epidemiology of sepsis. It is not clear that prognostication tools validated in developed countries are applicable to resource-limited settings. Our study assessed for predictors of 28-day mortality among a Rwandan patient cohort.

Methods

A prospective study enrolling adult patients (18 years and older) diagnosed with sepsis at two tertiary healthcare facilities in Rwanda - University Teaching Hospital of Kigali (CHUK) and King Faisal Hospital (KFH). Enrollment began on October 1st 2014. Clinical, laboratory and management data were collected to assess for predictors of mortality. RAPS, REMS and MEDS scores were calculated.

Inclusion criteria:
- All patients aged 18 years and older who presented to the study sites with suspected sepsis, and who met all of the following criteria: > 2 systemic inflammatory response syndrome (SIRS) criteria, clinical suspicion of infection and/or laboratory or microbiologic evidence of infection, absence of alternative explanation for SIRS.

Exclusion criteria:
- Patients who were unable to provide consent (or next of kin if incapacitated), - Patients who were not expected to require hospitalization for at least 24 hours, - Pregnant women

172 patients have been enrolled so far in our study. 31 individuals were lost to follow-up, 38 (26.9%) and 103 patients (73.1%) were enrolled, 57 enrollees were female (40.4%), 90 patients (63.8%) were below 50 years of age. Overall 28-day mortality was 29.1%. On preliminary univariate analysis, we found that independent predictors of mortality were hypoxia (oxygen saturation below 90 % vs. above 90%), OR 6.89 (95%CI 3.06-15.52, p<0.001), stage of sepsis on admission (severe sepsis vs. OR 10.71, 95%CI 3.46-33.14, p<0.001), time of diagnosis of sepsis compared to SIRS presentation (7 hours post presentation vs 1 hour, OR 73.33, 95%CI 15.03-357.73, P<0.001), and appropriateness of antibiotic received based on blood culture results (inappropriateness vs appropriate antibiotics OR 185.25, 95 % CI 21.83-1572.12, p<0.001). These factors remain significant in multivariate analyses. Volume of IV fluids received early in disease course was positively correlated with survival (p=0.033). We found that the MEDS score was the most reliable prognostic tool for 28-day mortality with an area under the curve (AUC) of 0.84.

Conclusion

Hypoxia, stage of sepsis on presentation, use of inappropriate antibiotics and late recognition of sepsis were associated with higher mortality while volume of IV fluid administration was positively correlated with improved survival in our patient cohort.

Of prognostic systems feasible for use in our practice setting, the MEDS score was found to be most reliable in predicting mortality.