Reviewer's report

Title: Multi-Drug Resistant Gram Negative Bacterial Infections and use of intravenous Polymyxin B in Critically ill Pediatric Patients of a developing country.

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Reviewer: Stephen K Obaro

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The investigators in this report performed a retrospective chart review of children who were admitted to the pediatric intensive care unit of Aga Khan University Hospital from January 2010 to December 2011 and extracted the demographic details of children who had multi-drug resistant Gram negative (MDR GN) infections, reviewed the antibiotic susceptibility patterns, outcome. The report provides an interesting overview of the etiologic agents MDR GN infections at this facility. There are however a number of issues that may limit the generalization of their findings.

1. While the duration of the study was over a year and this period should capture seasonal events, the absolute number of cases does not provide a sizeable number of individual isolates to deduce meaningful treatment strategies.

2. The investigators report 803 patients of which 36 patients developed 47 episodes of MDR GN infections. However, it was not clear from the report what criteria were adopted for the determination of clinical cure. Thus some of the 47 episodes may have been relapse or incomplete cure of the initial episode.

3. The report describes a subgroup of patients who presented to the ICU with MDR GN infections. It will be most helpful to have descriptive data on the pattern of infection from the community or some estimate of crude mortality from MDR GN at the hospital in general. This will more accurately reflect the fractional contribution of MDR GN infections that require ICU management.

4. A crude mortality rate of 44% was reported in this cohort. While this rate is alarming, it is difficult to attribute mortality to MDR GNR or the underlying morbidity in the absence of a control group. What was the overall mortality rate in the unit during the period of study? What was the mortality rate in children that did not have MDR GN infections?

5. Molecular characterization of the few of the most frequently isolated agents such as Acinetobacter spp and K. Pneumoniae would have been informative.

6. The retrospective nature of the study did not allow for ascertainment of the history of previous hospitalization which would have been helpful in ascertaining the likely source of acquisition of the MDR GN infection.
7. The description of the criteria set for polymyxin B-related toxicity is confounded by the lack of a control group. Since these are critically ill patients, their underlying conditions may have predisposed to renal function abnormalities and any increase in creatinine during treatment with polymyxin B may not necessarily demonstrate a causal relationship. The use of a control group would have been helpful with this determination.