

## From the Desk of the Editor

# Management of sepsis in resource poor countries: cutting your coat according to your cloth

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Low and middle-income countries (LMICs) bear the largest part of the global burden of sepsis.<sup>1</sup> In these resource poor countries, outcome of patients with sepsis is poorer and the mortality is higher, when compared to developed nations.<sup>2</sup> Current international guidelines for management of sepsis and septic shock is largely based on studies and research from resource rich settings.<sup>3</sup> Applicability of such guidelines in resource poor settings can be questionable due to difference in availability of trained health care workers, laboratory support, equipments, infrastructure and logistics.<sup>4</sup> Extrapolation of the recommendations may, in some instances, be harmful. In African children with severe infection, administration of a fluid bolus (as recommended by international guidelines) was associated with a higher mortality than restrictive fluid management.<sup>5</sup> Similarly, early initiation of enteral feeding in non-intubated patients with cerebral malaria may increase mortality in resource-poor settings.<sup>6</sup> Recent definition considers sepsis as a life-threatening organ dysfunction caused by a dysregulated host response to infection.<sup>7</sup> Etiology of sepsis in resource poor settings is different than those in developed countries. Malaria, dengue, typhus, leptospirosis and viral hemorrhagic fever contribute significantly to the cause of sepsis. Pathophysiology of sepsis due to these etiologies varies from the bacterial sepsis. Similarly, some principles of management would differ, especially those related to fluid resuscitation and fluid management.<sup>8</sup> For detection of organ dysfunction due to sepsis, the recent definition suggests the use of Sequential Organ Failure Assessment (SOFA) score. An increment of 2 or more points is considered to indicate organ dysfunction. A new bedside clinical score termed quick SOFA (qSOFA) has been suggested to identify the patients with infection, who are likely to have poor outcome.<sup>7</sup> In resource poor settings, effective application of the new definition, and thus calculation of SOFA score, can be challenging due to lack of resources and trained clinicians.<sup>9</sup> Recent recommendations suggest the use of qSOFA to diagnose sepsis in resource-limited settings.<sup>10</sup> However, when compared to SOFA, qSOFA may have limited utility to predict mortality in patients with sepsis in ICU.<sup>11</sup> Early sepsis recognition is one of the key elements that can improve the patient outcome.<sup>12</sup> The tool or scoring system used for diagnosis of sepsis should be validated in resource poor settings and should have simple and easily obtainable values or parameters at bedside.<sup>9,13,14</sup> Besides early detection, initial focused resuscitation, together with proper post-resuscitation monitoring and reassessment can improve outcome in patients with sepsis in resource limited settings.<sup>12</sup> Knowledge and understanding of sepsis is often sub-optimal in the first line health care workers from resource limited settings.<sup>15</sup> Training of medical practitioners about recognition of sepsis, resuscitation and monitoring can improve the care of these patients.<sup>12</sup>

Introduction of early goal-directed therapy (EGDT) for treatment of sepsis and septic shock revolutionized the management of sepsis.<sup>16</sup> However, subsequent multicentric studies showed that EGDT did not confer better results than usual care and was associated with higher utilization of resources and higher cost. Of note, all three multicentric trials after EGDT were conducted in resource rich settings. Early recognition of sepsis, early fluid resuscitation and administration of antibiotics were performed in all patients as the part of usual care. These findings may not be generalized to LMICs where the trained health care workers are limited and mortality of sepsis remains high.<sup>2,15,17</sup> In resource limited settings with scarcity of trained personnel, use of protocols and checklists would depend less on highly specialized knowledge and may improve outcome.<sup>18-20</sup>

Recommendations for management of sepsis in resource poor setting should consider availability of resources, feasibility, affordability and safety; similar to the concept of cutting the coat according to the cloth.<sup>4</sup> Early diagnosis and appropriate management of non-bacterial etiology of sepsis should be considered.<sup>8</sup> Empirical antibiotic selection should be based on local disease epidemiology and antibiotic susceptibility patterns. Due to lack of antimicrobial stewardship programs, multidrug resistant organisms causing sepsis are quite common in resource poor settings.<sup>21</sup> As the ICU capacities and level of care might vary widely even in the resource limited settings, recommendations for management based on availability of diagnostic facilities and training of medical personnel may be reasonable.<sup>22,23</sup> Easily available bedside tools like point-of-care ultrasonography can be a valuable adjunct to facilitate management of these patients.<sup>24,25</sup> There is a dearth of research in resource-poor settings in the field of sepsis management.<sup>26</sup> Future research should focus on need assessment, prognostic scoring and cost-effectiveness evaluation.<sup>18</sup> This largely unexplored field of critical care medicine should be the focus for future research, which would potentially generate good quality evidences and thus may improve the outcome of patients with sepsis in resource poor settings.<sup>26</sup>



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