

Abstract Submission

25. Sickle cell disease

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INVASIVE BACTERIAL INFECTIONS IN GAMBIAN PATIENTS WITH SICKLE CELL ANEMIA IN AN ERA OF WIDESPREAD PNEUMOCOCCAL AND HAEMOPHILUS INFLUENZA TYPE B VACCINATION

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Background: Bacterial infections cause significant morbidity and mortality in patients with sickle cell anemia, especially in populations without reliable access to antimicrobial prophylaxis and treatment. The longstanding use of penicillin prophylaxis and vaccination for *Streptococcus pneumoniae* and *Haemophilus influenzae* type b in resource-rich settings has minimised the additional risk of invasive bacterial infections associated with sickle cell anemia. However, these interventions are not routinely implemented in much of Africa, despite this region having the greatest burden of disease, with over 80% of people with sickle cell anemia born on the continent. The Gambia has well established vaccination programmes for pneumococcal and *Haemophilus influenzae* type b, which is rare in the region. There is little data on the identity of bacterial infections in African sickle cell anemia populations, and we believe (until this study) there were no data from countries with comprehensive vaccination programmes against *Streptococcus pneumoniae* and *Haemophilus influenzae* type b.

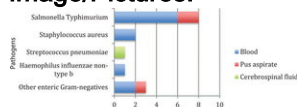
Aims: Primary: to determine the predominant pathogens causing invasive bacterial infections in a population of sickle cell anemia patients admitted to the Medical Research Council Unit Gambia. Secondary: to review the characteristics of this sickle cell anemia population.

Methods: A retrospective analysis of the clinical and laboratory records relating to 161 admissions of 126 patients with sickle cell anemia admitted to the Medical Research Council Unit Gambia over a five-year period (between April 2010 and April 2015) when there was high coverage of pneumococcal and *Haemophilus influenzae* type b vaccination.

Results: Pathogenic bacteria were cultured from blood in 11 of the 131 admissions which had blood cultures taken (8.4%, 95% CI 4.5-14.1%). The most frequent organism isolated was *Salmonella typhimurium* (6/11; 54.5%), followed by *Staphylococcus aureus* (2/11; 18.2%) and other enteric Gram-negative pathogens (2/11; 18.2%) and there was one case of *Haemophilus influenzae* non-type b bacteremia (1/11; 9.1%). No cases of bacteremia caused by *Streptococcus pneumoniae* or *Haemophilus influenzae* type b were identified.

The most common diagnosis causing the admission was vaso-occlusive crisis (53/161; 32.9%), followed by infective complications including pneumonia (16/161; 9.9%) and osteomyelitis (12/161; 7.5%). The median length of admission was five days and the median age of patients was five years (IQR: 2-13 years). A new diagnosis of sickle cell anemia was made during the admission in just under half of patients.

Image/Pictures:



Summary/Conclusion: The predominance of non-typhoidal *Salmonella* and other enteric Gram-negatives as the causative agents of invasive bacterial infections in our study is striking. Despite its success in resource-rich settings, penicillin may not be the optimal prophylaxis for sickle cell anemia patients already vaccinated for pneumococcal and *Haemophilus influenzae* type b in The Gambia. For sickle cell anemia patients with suspected bacterial sepsis, empirical treatment must be effective against both non-typhoidal *Salmonella* and *Staphylococcus aureus*, and account for local resistance patterns. As other countries in the region adopt pneumococcal and *Haemophilus influenzae* type b vaccination programmes, they may see a change in the spectrum of pathogens found in sickle cell anemia patient populations. Local research may be needed to determine appropriate antimicrobial treatment and prophylaxis regimens for patients with sickle cell anemia.

Keywords: Infection, Prophylaxis, Sickle cell anemia