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Title

Cephalosporin resistance in Malawi; the twin challenge of improving antimicrobial access and stewardship

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Okomo and colleagues have reviewed available data on aetiology of neonatal infection in sub-Saharan Africa and, in doing so, have highlighted the high prevalence of resistance to WHO recommended empirical antibiotic regimens and the limited access to "last-resort" antibiotics, the clinical consequences of which are likely to be severe.[1]

In Malawi, 20 years of surveillance data has captured a recent and concerning rise in antimicrobial resistance (AMR) among invasive bacterial infections in patients of all ages.[2] These data, collected as part of routine clinical care from adult and paediatric patients presenting to the largest hospital in the country, describe results from 194,539 blood cultures, but fall outside of the inclusion criteria of Okomo and colleagues by not delineating the neonatal subset.[2,3] Between January 2013 and June 2018, 1392 cultures grew *Klebsiella* spp. (636 total, 345 neonates) or *E. coli* (756 total, 89 neonates). In total, 85·7% (56·9% neonates) *Klebsiella* spp. and 31·7% (9·2% neonates) *E. coli* were resistant to third-generation cephalosporins (3GC-R). In contrast, 95·7% *Klebsiella* spp. and 95·0% *E. Coli* were amikacin susceptible.

Access to an effective range of antibiotics is limited in most Malawian healthcare settings, even those on the WHO "access" list[2-4], frequently rendering the third-generation cephalosporin ceftriaxone both the first-and last line treatment for severe bacterial infection. Antibiotics that retain their efficacy against extended spectrum beta lactamase producing bacteria, such as amikacin and carbapenems, are not routinely available. Carbapenems are prohibitively expensive in Malawi; a day's course of meropenem costs 53 USD, whilst amikacin is difficult to procure due to restricted access for preservation in the management of MDR TB[5], therefore, patients with 3GC-R bacterial infection frequently remain untreated with an effective antibiotic. Although the outcomes for patients with resistant bacterial infection in Malawi are not yet known, they are likely to be poor.

Antimicrobial resistance is a global public health problem, the challenges of which are context specific. The combination of most hospitals not having access to culture and sensitivity testing, the rising prevalence of AMR and severely limited access to a range of effective antibiotics are part of Malawi's AMR challenge, which will no doubt be shared by many other low-income settings. Whilst improved access to antibiotics is now critical in Malawi, especially for neonates, it must go hand in hand with careful stewardship and improved infection prevention and control to avoid the rapid emergence of resistance to these agents.

References

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Declaration of interests

The authors declare no conflicts of interest