Resistant acute respiratory infections and diarrheal disease in Zambia: A situation and needs assessment.

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Abstract

Acute respiratory infections (ARI) and diarrheal disease (DD) are major causes of morbidity and mortality in sub-Saharan African, and Zambia is not an exemption. Current antibiotic regimens often fail due to antibiotic resistance (ABR), causing adverse effects for patients, policy-makers, and clinicians. The additional growing problems with substandard and counterfeit drugs increase the possibilities of treatment failures. In order to improve treatment, antibiotic regimens and guidelines should be modified based on antibiotic resistance surveillance data and drug quality monitoring. The benefits of this modification include: better patient outcomes, drug availability and cost savings.

This study explored existing country specific antibiotic resistance data on pathogens causing acute respiratory tract infections and enteric diseases in Zambia. By establishing accurate antibiotic resistance profiles, physicians and health officials can institute adequate treatment and prevention policies.

Methods

APUA conducted: 1) a survey on antibiotic resistance work being done at country level both by pathogens and by antibiotic drug or class; 2) Gathered information on who is working on drug resistance issues – including local and expatriate research groups, research institutes, university departments, medical schools, veterinary schools, and other organizations involved in biomedical and relevant social science and anthropological research; 3) Assessment of immunization status for key ARI and enteric pathogens; and 4) In-depth literature review of published and unpublished local data on drug resistance for invasive infections, ARI, and the main enteric pathogens.

Ethical clearance was obtained from the Tufts University Institutional Review Board and also from the corresponding review boards in Zambia. In addition, the project investigators were registering as researchers with the University of Zambia Research Ethics Committee of Zambia.

Results

1. Antibiotic-resistant acute respiratory infections (ARI) and diarrheal disease (DD) (> HIV and malnutrition) are common pediatric issues, but the lack of surveillance and reliable diagnostics obscure the true disease burden.

2. The most frequent serotypes of S. pneumoniae were: 6, 19, and 23.2

3. H. influenzae resistance to chloramphenicol was very high.

4. S. aureus from the blood of meningitis patients had high resistance to ampicillin, amoxicillin, and chloramphenicol.

5. At the University of Zambia Teaching Hospital (UTH), penicillin-resistant S. pneumoniae rose from 14.3% (1990s) to 53.67% (2007). S. pneumoniae remained sensitive to amoxicillin, but not to cotrimoxazole. Its resistance rose from 12.7% (1990) to 100% (2005).

6. E. coli, Vibrio cholerae, Salmonella spp., and Shigella spp. were frequently isolated from stool samples of diarrhea patients. Most Shigella spp. were isolated from children under 5 years: Antibiotic resistance to common drugs is high. 3

Conclusions

Despite limited data, S. pneumoniae is recognized as a primary pediatric pathogen for acute respiratory infections. Amoxicillin plus gentamicin best choice for severe pneumonia. Short-Course Home Oral Therapy (NO-SHOTS) of pneumonia with amoxicillin seem to be better option than injectable penicillin and reduces treatment failures. Enteric bacteria (E. coli, V. cholerae, Salmonella spp., and Shigella spp.) also infect many Zambian children. Zambia lacks reliable surveillance data and should do the following to improve the diagnosis and treatment of ARI/DD pathogens:

- Equip microbiology laboratories for routine diagnostics of key pathogens
- Train and maintain staff
- Perform quality assurance
- Monitor antibiotic resistance trends in Zambia
- Disseminate surveillance data among policy makers and clinicians

References


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