Improving rational use of antibiotics in childhood upper respiratory tract infections in rural China

RESEARCH BRIEF

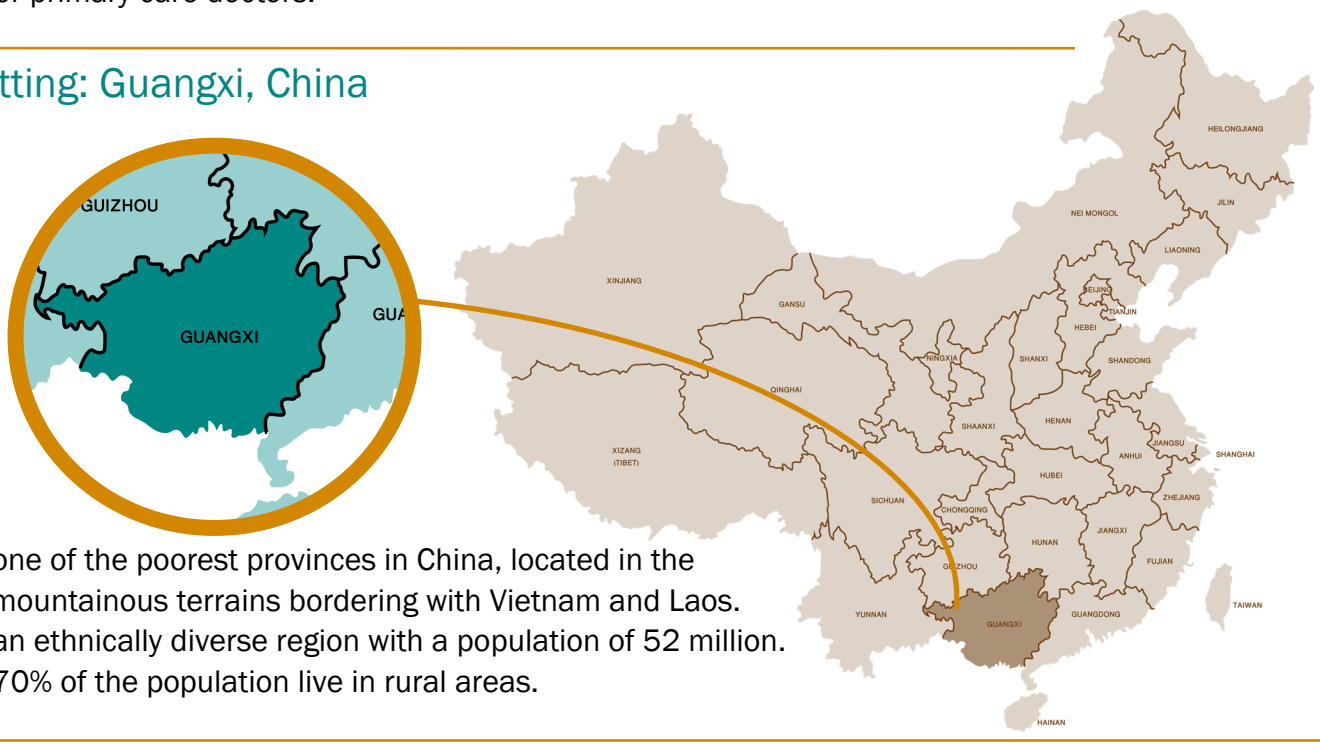
Overuse of antibiotics for humans and animals has been a serious issue in China. Currently, studies exist on antibiotics use in China for primarily urban areas or eastern provinces, but very few in western, rural provinces where the inappropriate use of antibiotics may be greater due to the relatively weak health system.

China's rural health facilities, including county hospitals, township hospitals and village clinics, treat over 70% of the Chinese population; thus understanding antibiotic prescriptions in rural health facilities is crucial. Several national policies have been issued by the Ministry of Health to deal with the irrational use of antibiotics. However, no operational details were provided on how to implement the policy, and no guidelines were provided on the diagnosis and treatment of childhood URIs or the related clinician training, especially for primary care doctors.

Implications of our study

- Strengthening the supervision of antibiotic use in township hospitals is a priority.
- Limiting broad-spectrum and injectable antibiotic use is clearly needed. This will need operational policy on educational interventions for both clinicians and the general population.
- Health systems factors and financial incentives may influence antibiotic overprescribing.
- Further training for clinicians is required on clinical skills and their communication with patients.
- A health systems approach is urgently needed. This includes stopping hospitals' global budgets being tied to their previous year's budgets to encourage cost reductions, ensuring strong leadership on combating antimicrobial resistance (AMR), establishing an AMR audit and reporting system, and raising AMR awareness.

Study setting: Guangxi, China



Guangxi is one of the poorest provinces in China, located in the southwest mountainous terrains bordering with Vietnam and Laos. Guangxi is an ethnically diverse region with a population of 52 million. More than 70% of the population live in rural areas.

Stage 1: Retrospective, cross-sectional study

We assessed the condition of antibiotic use at health facilities at county, township and village levels in rural Guangxi by calculating outpatient upper respiratory tract infections (URTIs) prescriptions.

Method

We employed a stratified, random sampling method. In total, we included 4 county hospitals, 8 township hospitals and 8 village clinics from eastern, western, southern and northern regions. We conducted a retrospective prescription review and included prescriptions for children aged 2–14 years with a primary diagnosis of URTIs, between January and December 2014.

Key findings

- The percentage of antibiotic prescription was the highest in township hospitals (68%), almost two times higher than that in county hospitals (34%) and village clinics (32%);
- High proportion of injectable antibiotics used (60%);
- High rate of broad-spectrum molecules (54–82%) among antibiotics prescriptions;
- Prescriptions without insurance co-payment were more likely to include antibiotics.

Stage 2: Cluster randomised controlled trial (cRCT)

We developed and tested a comprehensive package targeting both doctors and caregivers in township hospitals to reduce unnecessary prescribing of antibiotics for URTIs in children aged 2 to 14 years old. The aim was to scale this up in primary care facilities in poor, western, rural China.

Method

We randomised (stratified by county) 25 township hospitals to an intervention (12) or control (13) arm by computer programme. We used clinical guidelines and training on appropriate prescribing, monthly prescribing peer-review meetings and caregiver education.

Key findings

- The antibiotic prescription rate in the intervention arm dropped from 82% to 40%, while the prescription rate in the control arm decreased from 75% to 70%;
- Across all prescriptions, the mean antibiotic cost was significantly lower in the intervention arm following covariate adjustment;
- There was a small, but significant increase in the prescription rate of traditional Chinese medicine;
- There were generally high prescription rates for antivirals (30-50%) and glucocorticoids (20%).

This brief is informed by the following research:

1. Zou G, Wei X, Hicks J P, Hu Y, Walley J, Zeng J, et al. (2016) Protocol for a pragmatic cluster randomised controlled trial for reducing irrational antibiotic prescribing among children with upper respiratory infections in rural China. BMJ Open. 6(5). doi.org/10.1136/bmjopen-2015-010544

2. Zhang Z, Hu Y, Zou G, Lin M, Zeng J, Deng S, et al. (2017) Antibiotic prescribing for upper respiratory infections among children in rural China: a cross-sectional study of outpatient prescriptions. Global Health Action. 10(1). doi.org/10.1080/16549716.2017.1287334

3. Hu Y, Walley J, Chou R, Tucker J D, Harwell J I, Wu X, et al. (2016) Interventions to reduce childhood antibiotic prescribing for upper respiratory infections: systematic review and meta-analysis. Journal of Epidemiology & Community Health. 70(12): 1162-1170. doi.org/10.1136/jech-2015-206543

4. Wei X, Zhang Z, Walley J, Hicks J P, Zeng J, Deng S, et al. (2017) Effect of a training and educational intervention for physicians and caregivers on antibiotic prescribing for upper respiratory tract infections in children at primary care facilities in rural China: a cluster randomised controlled trial. The Lancet Global Health. 5(12): e1258-e1267. doi.org/10.1016/S2214-109X(17)30383-2

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