

Antibiotic stewardship in pediatrics: global health priority

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Abstract

Multidisciplinary antibiotic stewardship (AS) programs targeting both inpatient and outpatient antibiotic prescription to children need to be urgently developed in every country and implemented to tackle this global antibiotic menace.

Key words: antibiotic stewardship, Resistance, Pediatrics

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There is nothing denying the fact that there has been ever increasing use and misuse of antibiotics amongst pediatric populations across the world over the recent years. The implications of such misuse and overuse of antibiotics are already evident: drug-related adverse events, increasing antibiotic resistance encountered in clinical scenarios, the development of *Clostridium difficile* infection and alteration in microbiota. The development of new antibiotics suitable for use in pediatric populations hasn't been able to keep pace with this ever increasing antibiotic demand. Antibiotic misuse and overuse is thus a serious patient safety concern and a global public health priority. In a recent report by Singh JK et al on antibiotic susceptibility of bacterial agents in children with Severe Acute Malnutrition (SAM) from a tertiary care hospital in Madhya Pradesh, India, most bacterial isolates were found to be resistant to commonly used antibiotics [1]. These results reinforce urgent need to implement robust strategies for limiting the emergence of antibiotic-resistant bacterial strains.

It's a routine observation to see children being prescribed antibiotics in outpatient departments in viral illnesses or being prescribed broad spectrum antibiotics when narrow spectrum would have been apt. It is becoming a reflex response of residents posted in pediatric emergencies to start broad spectrum intravenous antibiotics to almost every patient being admitted in pediatric emergency without a proper evaluation and work up. Every patient not responding to therapy is taken as indication of failure of first line antibiotics and upgradation of antibiotics is followed almost blindly without considering other factors which could have led to failure of child to respond to therapy.

Upon receiving antibiotic susceptibility pattern on positive culture reports, de-escalation of antibiotic therapy is rarely considered. It is high time for each one of us to introspect our policy of antibiotic drug use and update oneself with latest guidelines for antibiotic use amongst the vulnerable pediatric population.

There is growing evidence based on the benefits achieved with implementation of antibiotic stewardship programs in both hospital and out-patient settings amongst pediatric populations. Agwu et al. evaluated a World Wide Web-based antimicrobial restriction program at a 175-bed, tertiary care pediatric teaching hospital and reported 11.6% reduction in the number of dispensed antibiotic doses leading to \$370,069 reduction in projected annual costs [2]. Di Pentima et al. reported steady decline in antimicrobial use, expressed as the number of doses administered per 1,000 patient-days, as measured 3 years before and 3 years after the implementation of the AS program carried out in a pediatric teaching hospital in Tennessee, USA [3]. Similar promising results have been reported with implementation of AS program in outpatient settings by Gerber et al who reported almost 50% decline in broad-spectrum antibiotic prescriptions [4].

Despite the concern of increasing bacterial resistance, the situation is not as dismal. Upadhya K et al have reported high efficacy of injection crystalline penicillin as first line antibiotic in treating hospitalized children with community acquired pneumonia [5]. These results strengthen the claim that rational antibiotic prescriptions can still be highly efficacious and at the same time benefit in curbing increasing antibiotic resistance being encountered commonly nowadays.

Multidisciplinary antibiotic stewardship (AS) programs targeting both inpatient and outpatient antibiotic prescription to children need to be urgently developed in every country and implemented to tackle this global antibiotic menace. Clear-cut guidelines for AS need to be framed which should address most of the queries related to antibiotic use amongst children: when to start antibiotics, whether to start narrow spectrum or broad spectrum antibiotic, dosage, route, duration, when to upgrade to second line or third line antibiotics, and most importantly when to de-escalate antibiotic therapy. Implementation and maintenance of AS programs to encourage and maintain judicious use of antibiotics would require collective effort by all the stake holders, administrative and financial support along with regular appraisal of the benefits of ongoing AS program to take a call on its continuation.

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