Correspondence

Emergence of fluoroquinolone resistance in Shigella isolated from Andaman & Nicobar Islands, India

Sir,

The Andaman & Nicobar Islands, situated in the Bay of Bengal, are an Union Territory of India. Health care in these islands (population of about 350,000) is almost entirely provided by the Government. G.B. Pant Hospital, located at Port Blair, is the only referral hospital in the islands. Bacteriological surveillance carried out by the RMRC, Port Blair at this hospital, has identified shigellosis as endemic and a major cause of acute diarrhoea in children.1,2 Like in mainland India and most of the other developing countries Shigella flexneri 2a has been the commonest isolate with the proportion of different species and serotypes of Shigella isolated showing considerable variation. For example, S. dysenteriae 1 was dominant during an outbreak during 1995-96 while S. sonnei and S. flexneri appeared as the commonest isolate in alternate years during 2000-2004.1,3 Antibiotic resistance pattern also showed variations. As in all developing countries, the choice of limited number of effective antimicrobials for empirical treatment of suspected infections caused by rapid emergence of multi-drug resistant shigellae has been a problem to clinicians in these islands. The ampicillin (AMP)-co-trimoxazole (CoT) resistant strain of S. dysenteriae type 1 showing complete resistance by disc (Hi-Media, Mumbai, India) diffusion method4 to CIP (5 μg), NOR (10 μg), NAL (30 μg), ofloxacin (OFX, 5 μg) was isolated from a 3 yr old female child admitted to G.B Pant Hospital. The study was approved by the Institutional Ethical Committee of the Regional Medical Research Centre, Port Blair. This strain was also resistant to ampicillin (AMP, 10 μg), CoT (25 μg), tetracycline (TET 30 μg) and chloramphenicol (CHL 30 μg) but sensitive to gentamicin (GEN 10 μg) and nitrofurantoin (NIT, 300 μg). It showed intermediate resistance to gatifloxacin (GAT, 5 μg). All resistances were measured by disc diffusion method on Mueller Hinton Agar medium following manufacturer’s (Hi-Media, Mumbai) instruction and zone size interpretations for sensitivity, resistance and intermediate resistance instructions given therein as per CLSI guidelines5. Internal quality control strains S. aureus ATCC 25923 and E.coli ATCC 25922 were included in each test. Resistance to new drugs generally develops first in S. dysenteriae type 1 and the other species and serotypes acquire them subsequently. Following this trend we expected emergence of fluoroquinolone resistance in the commonly circulating S. sonnei and S.flexneri very soon. However, S.sonnei, the species that was emerging as the most predominant species in the islands since 2000, disappeared completely after 2005 and was replaced again by the endemic S. flexneri 2a. During this time, the Great Asian Tsunami of December 2004
not only altered the topography of the island but also brought about a massive change in the socio-economic conditions of the people, their lifestyles, demography, health and sanitation. The possibility of this event having a bearing on the altered pattern of shigellosis in the islands cannot be ruled out. There has been a sharp decline in cases of acute childhood diarrhoea during the two years that followed the Great Asian Tsunami, perhaps due to revamped public health systems. Only three isolates (1- S. dysenteriae; 2- S. flexneri) were obtained during 2006-2007 and all were resistant to NAL with two showing NOR resistance as well (Table). However all these isolates were sensitive to CIP, OFX and GAT. All the three isolates (all S. flexneri) obtained during 2007-2008 showed resistance to NOR and CIP in addition to NAL. One of these isolates showed resistance to OFX and GAT too. The MIC of the resistant isolates performed by E-Test (AB BIODISK, Sweden) gradient diffusion method, as has been done in recent studies ranged between 0.5 µg to >240 µg for NAL, 1 µg to >240 µg for CIP and 0.5 µg to >240 µg for NOR that were all above the breakpoint for reduced susceptibility as per the CLSI guidelines and therefore were totally resistant. However, all these fluoroquinolone resistant isolates were sensitive to azithromycin, ceftriaxone and imipenem. Despite the fact that only a small number of isolates were obtained during 2006-2008 due to reduced incidence of diarrhoea, our study shows the emergence of fluoroquinolone resistance in Shigella in these islands necessitating a review of current treatment strategy for empirical treatment of shigellosis.

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