



Typhoid fever in Pakistan: a recurring challenge?

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Dear Editor

In Pakistan, as in Brazil, the water- and food-borne infections constitute important and unsolved public health problems causing high rate of morbidity and mortality; and recent manuscripts have stressed the role of infection by *Salmonella enterica* subspecies (1,2). During the current COVID-19 pandemic the routine attention to endemic infections has lowered in the whole world, hampering the prevention and control of these entities (1). Additional concerns are about the low rate of successful anti-typhoid fever (TF) vaccination programs and the elevated number of antibiotic resistance occurrences in developing countries (1). Early adequate antimicrobial therapy is needed to avoid complications and mortality (2). The resistance to ampicillin, chloramphenicol and cotrimoxazole is generalized, and multidrug-resistant (MDR) *S. Typhi* is evolving to extensively drug-resistant (XDR), that is MDR plus resistance to fluoroquinolones and thirdgeneration

cephalosporins (1). Therefore, it is useful to remark on some major aspects of this novel scenery.

Pakistan is one of five countries declared as endemic for TF (2). Transmission involves all age ranges, predominantly affecting children, and the yearly global incidence of TF is over 18 million cases with more than 200,000 deaths (1). Besides, approximately 1,000 cases per 100,000 children have been reported annually, and patients infected by MDR and XDR *S. Typhi* were confirmed in public hospitals (1,2). Uncontrolled over the counter antibiotic sales, and suboptimal dose of antimicrobials, contribute to the diagnosis delay and to increased resistant bacteria (1). Saleem *et al.* undertook a cross-sectional study (from 2019 to 2020) on the sensitivity of *S. Typhi* in 149 children aged 3-12 years and with TF. Resistance to ampicillin, cotrimoxazole, chloramphenicol and ceftriaxone was over 80%, while sensitivity for meropenem, azithromycin, and ciprofloxacin achieved 100%, 93.3% and 53.7%, respectively (2). Rose spots, high fever of gradual onset, and temperature-pulse dissociation (Faget sign) were emphasized as classical signs of TF; as well as usual manifestations in children including vomiting, diarrhea, anemia, thrombocytopenia and hepatosplenomegaly (2). Worthy of note is a complete resistance to fluoroquinolones (including gatifloxacin after 2010) which is associated to prolonged fever and treatment failures of patients with TF. The conclusive comments included the need for constant monitoring of antimicrobials sensitivity, with corrective measures to avoid the irrational use of fluoroquinolones (2).

In Brazil, 1,127 cases of TF with 8 deaths were reported from 2010 to 2019, affecting 28.7% patients with 20 to 34-year-old, 58.2% males, 70.2% from the North region, and 81.5 % from urban areas (3). Main symptoms were fever (92.9%), headache (70.2%), abdominal pain (63.3%), diarrhea (62.4%), and asthenia (59.0%). Infections were due to consumption of untreated water (25.0%) and contaminated foods (14.2%). Although a reduction in cases of TF was observed in the period analyzed, there may have been some reduction in the suspicion, notification, or diagnostic investigation (3).

In the present setting, one can barely estimate the deleterious burden of the ongoing COVID-19 pandemic on neglected infectious diseases, as is the case of TF in low-income areas such as slum districts of Karachi (1).

Key words: Antibiotic resistance, Pakistan, *Salmonella Typhi*, Typhoid fever.

Conflict of interest

The authors had full freedom of manuscript preparation and

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Authors' contributions

All authors made substantial contributions in following aspects: (1) conception and design of the study, acquisition of data, and analysis and interpretation of the data; (2) draft of the article and critical review of the intellectual content; and (3) final approval of the version presented.

Ethical Statement

In writing the manuscript, the authors followed the policy of the Committee on Publication Ethics (COPE).

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