JPSIM Journal of Pakistan Society of Internal Medicine

Editorial

The Alarming Surge of XDR Enteric Fever in Pakistan: A Looming Public Health Crisis

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How to cite this:

Zeb S. The Alarming Surge of XDR Enteric Fever in Pakistan: A Looming Public Health Crisis. J Pak Soc Intern Med. 2024;5(4): 678-680

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Received: 20-09-2024

Accepted: 14-11-2024

DOI: https://doi.org/10.70302/jpsim.v5i4.2463

Introduction

The escalating incidence of extensively drug-resistant (XDR) enteric fever in Pakistan, particularly in Khyber Pakhtunkhwa, is a stark reminder of the country's deep-rooted public health challenges. Enteric fever, caused by Salmonella species, spreads predominantly through the orofecal route, and yet public awareness regarding its transmission remains dismally low.[1] This knowledge gap, compounded by the unavailability of clean and safe drinking water, serves as a catalyst for the rapid spread of infection. Even in urban centers, access to potable water is inconsistent, and many citizens are forced to rely on contaminated sources, creating an ideal environment for the disease to thrive.

The situation is even more precarious in rural and underprivileged areas where the lack of basic sanitation infrastructure leads to uncontrolled outbreaks. Poor personal hygiene, along with unsafe food and water handling practices, further exacerbates the situation, particularly in densely populated and resource-deprived regions.[2] While government initiatives like public awareness campaigns are occasionally implemented, they remain sporadic and insufficient in addressing the root causes of this epidemic.

XDR enteric fever is not just a medical problem but also a social and economic one. The disease disproportionately affects the poor, who are less likely to have access to clean water, adequate sanitation, and healthcare facilities. These communities often lack the financial means to seek timely medical attention, which leads to delay in diagnosis and treatment. By the time patients present to healthcare facilities, the disease has often progressed, leading to worst outcomes.[3]

The XDR strains currently circulating are resistant to both first- and second-line antibiotics, leaving only carbapenems and azithromycin as viable treatment options. This severely restricts the therapeutic arsenal available to clinicians, who are already working within an overburdened healthcare system. With such limited options, physicians are often forced to reserve these last-resort antibiotics for the most severe cases.[4] However, the overuse of carbapenems and azithromycin could potentially lead to resistance even against these drugs, a scenario that would render the treatment of XDR enteric fever nearly impossible.

One of the most alarming aspects of this crisis is the indiscriminate use of antibiotics, which is a major factor driving resistance. In rural and underserved areas, unlicensed practitioners, commonly referred to as "quacks," frequently prescribe antibiotics without proper diagnostic testing. Moreover, over-the-counter availability of antibiotics without a prescription further fuels the misuse.[5] The lack of regulation around antibiotic sales has created an environment in which these powerful drugs are routinely overprescribed or misused, often for conditions that do not warrant their use.[6]

In addition to improper prescribing practices, the absence of culture sensitivity testing across much of the province makes it difficult to tailor treatments to the specific needs of patients. Where such testing is available, it is often prohibitively expensive, putting it out of reach for the majority of the population. This has led to inappropriate treatments, contributing to both treatment failures and the worsening resistance crisis. Despite being obsolete, the Widal test continues to be widely used by quacks and peripheral doctors, leading to the misdiagnosis of enteric fever. This outdated diagnostic tool is particularly problematic as it perpetuates the

over-prescription of antibiotics, further accelerating the development of resistance. Accurate diagnostics, such as blood cultures and sensitivity testing, are essential but remain inaccessible to much of the population due to cost and logistical barriers.[7]

The rise of XDR enteric fever also reflects deeper policy failures. Public health campaigns addressing the prevention of enteric fever through education on hygiene, vaccination, and access to clean drinking water are sorely lacking. Furthermore, the government has yet to implement effective case isolation and contact tracing measures, which are crucial to curbing the spread of this highly infectious disease. Migrant screening, another critical component of controlling the spread, is notably absent, allowing resistant strains to travel and proliferate unchecked.[7] Vaccination programs, which could offer a robust defense against the spread of enteric fever, are not sufficiently promoted or accessible in many high-burden areas. While the introduction of the typhoid conjugate vaccine in Pakistan represents a significant step forward, its coverage remains patchy. Expanding this vaccination drive and ensuring it reaches the most vulnerable populations is vital for curbing the spread of the disease. Inadequate healthcare infrastructure, particularly in rural regions, makes it difficult to ensure vaccine distribution, leading to a lag in immunization coverage.[8]

The surge in antibiotic resistance presents a global health threat. With no new antibiotics introduced in the last decade, the world is running out of effective treatments. If the current strains of XDR enteric fever become resistant to carbapenems and azithromycin—the last remaining options—the implications for public health would be catastrophic. This would not only affect Pakistan but also have far-reaching consequences for global health security. Travellers, migrant workers, and cross-border populations could easily carry these resistant strains to other countries, potentially sparking outbreaks in regions where healthcare systems may be better equipped but are still vulnerable to the threat of superbugs.[5]

International collaboration is essential to address the crisis of XDR enteric fever. Global health organizations like the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) must play a role in supporting local efforts through funding, research, and the sharing of best practices. Collaborative research on new antibiotics and alternative treatment options should be prioritized to prepare for the possibility that current drugs will eventually fail.[3] Addressing this crisis requires a multifaceted approach. Immediate measures must include investment in clean water infrastructure, public health education campaigns, and widespread vaccination efforts. The healthcare system must be bolstered with better diagnostic facilities and strict regulations on antibiotic prescriptions. Encouraging the use of culture sensitivity tests in primary healthcare settings could prevent unnecessary antibiotic prescriptions and ensure that patients receive appropriate treatment.[9]

Additionally, the government must take steps to regulate the sale of antibiotics, ensuring that they are only available with a valid prescription. Public health campaigns need to focus on educating the public and healthcare workers alike on the danger of antibiotic overuse. Training programs for doctors, particularly those in rural areas, should be prioritized to reduce the misuse of diagnostic tools like the Widal test and promote evidence-based treatment strategies.

Investing in research and development for new antibiotics is equally critical. Pharmaceutical companies must be incentivized to focus on antibiotic research, as the current pipeline for new drugs remains alarmingly sparse. Without these critical interventions, XDR enteric fever will continue to spread, pushing Pakistan's already fragile healthcare system closer to collapse and bringing the global community closer to a post-antibiotic era. The time for action is now. The consequences of inaction are dire—not just for Pakistan, but for global health security.

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