

Typhoid Fever: The Challenges of Medical Management

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INTRODUCTION

Salmonella enterica serotype typhi is the aetiological agent of typhoid fever, a multisystemic disease with protean manifestations and initial lesions in the bowel. Typhoid fever still remains a major public health problem in developing countries even in the twenty first century [1,2]. This was also the case in America and Europe three centuries ago, until measures for sanitary disposal and supply of potable water were put in place. Unacceptable morbidity and mortality are still recorded in developing countries in spite of availability of several drugs over the years for the treatment of typhoid fever. There is enough evidence to show that the prevalence of typhoid fever in any community is an index of communal hygiene and effectiveness of sanitary disposal.

In Nigeria, as in other developing countries of the world, studies have estimated over 33 million cases and 500,000 deaths due to typhoid fever per year [3]. Several factors are responsible for the failure of public health measures to tame the tide of the continuing rise in the incidence, prevalence, morbidity and mortality of typhoid fever. The objective of this review is to highlight the challenges in medical management of typhoid fever and to proffer solutions.

The major challenges to the management of typhoid fever are diverse and formidable; especially so in economically disadvantaged continents such as Central and South America, Middle-East, South-East Asia and Africa. These challenges are similar and interactive in all countries listed. This review will focus on the under listed factors:

1. Poor environmental sanitation
2. Potable water
3. Health education
4. Confounding disease
5. Personal and communal hygiene
6. Laboratory facilities
7. Drug resistance
8. Fake and counterfeit drugs

Poor Sanitation

Adequate sanitation is the safe management of human excreta and includes both "hardware" (sanitation technologies, such as toilets and hygienic latrines) and "software" (hygiene promotion, such as hand washing with soap). The World Health Organization stated in the year 2000, that 40% (2.4 billion) of the world's population lacked access to basic sanitation [4].

One of the major public health concerns in cities in developing economies are slums with overcrowding at its worst. Poor urban planning without regard for waste disposal and drainage facilities. All these tend to encourage transmission of infectious diseases. An international workshop in 1986 identified ingestion of foods or water contaminated by acutely infected persons or chronic typhoid carriers as the most common form of transmission of the disease [5]. As a result of poor sanitation, typhoid fever is very common in communities where contaminated water and food is common.

Potable Water

Availability and potability of drinkable water is still a luxury in most developing nations of the world. The WHO estimated that 1.2 billion of the world's population lack access to potable water [5]. At the peak of the dry season, especially in developing countries, water is often sourced from various doubtful places most of which are contaminated by human waste. This no doubt accounts for the rise in the incidence of typhoid fever, which has been docu-

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mented in such communities during this period of the year [2,6].

Health Education

Knowledge is limited about many infectious diseases in developing countries as many diseases are still attributed to spiritual attacks by the common folks. Also, as a result of illiteracy, half-measures are often taken by self-medicating, in order to avoid the unaffordable cost of modern healthcare in a situation where there is no health insurance cover. This often leads to mismanagement with unsubstantiated remedies and misplaced spiritual intervention. As a consequence of this, patients with typhoid fever often present late and so with complications. Olubuyide in 1992 documented delay in seeking medical care, misdiagnosis, and inappropriate therapy as the factors that may contribute to mortality from typhoid fever among Nigerians [7]. Occasionally, inadequate pre-medication before seeking medical care often changes the expected clinical picture of the disease, thus also leading to misdiagnosis.

Confounding Diseases

Typhoid fever, as a multisystemic disease has been dubbed the great mimicker especially in the tropical and subtropical environment, where several other confounding infections and infestations present with febrile illness. Many of these febrile illnesses such as malaria, viral hepatitis and liver abscess, often present in a similar way as typhoid fever or even co-exist with typhoid fever. This often leads to delay or misdiagnosis and subsequent increased incidence of complications and mortality [8,9,10,11].

Personal and Communal Hygiene

Poor personal and communal hygiene is a common occurrence in less developed nations of the world especially among the illiterate population. Lack of public sanitation as a result of ineffective health policies leads to reckless deposition of wastes and use of bush paths and riverbanks as refuse dumps and defecation points. During the early rainy season, faecal matter from some carriers of typhoid fever are washed into rivers and brooks. Unsuspecting

members of the community use it for various domestic purposes including drinking, cooking, etc.

Laboratory Facilities

It is very difficult to isolate *Salmonella typhi* from urine and stool specimens in most developing countries. This is often due to lack of culture media, expertise and sometimes previous exposure to inadequate doses of antibiotics.

Another major problem relating to the laboratory is the abuse of the Widal's test. Some clinicians will not treat or suspect the disease unless the test is positive, while others treat with a positive result even in low titres for an endemic zone of typhoid fever or in the absence of clinical symptoms and signs. Ohanu *et al* showed that malaria could interfere with serological diagnosis of typhoid fever leading to overdiagnosis [12]. Typhoid fever in most developing countries is thus a disease of over- and under diagnosis. It would be wise to carry out studies of baseline value of typhoid agglutinins for every locality as has been done in some areas to know the diagnostic utility of the Widal's test. Advances in diagnosis of typhoid fever with the use of enzyme-linked immunosorbent assay [13] is still beyond the reach of most developing nations.

Drug Resistance

Resistance to chloramphenicol developed two years after its discovery in 1948; this phenomenon has since become a major challenge to contend with in the management of typhoid fever. Resistance has since been noticed with virtually all drugs including trimethoprim and ampicillin [14]. Recent studies have shown resistance and reduced susceptibility to ceftriazone and the quinolones [15, 16], however, quinolones are still regarded as the best and first-line drugs in the management of typhoid fever.

Fake and Counterfeit

In 2001, the National Agency for Food and Drug Administration (NAFDAC) in Nigeria, reported 50% of the drug in circulation in Nigeria to be fake. The problem of counterfeit and fake drugs no doubt has compounded the problem of management of typhoid fever, with a great potential for increased morbidity and mortality.

Suggested Solutions to Challenges in Management

It appears quite obvious that the solutions to medical management of typhoid fever will be along the line of the identified problems noted above. Improvement in personal and communal hygiene, effective waste disposal system and provision of potable water will no doubt go a long way in reducing the incidence of typhoid fever. Effective treatment of index cases, health education both for the populace and physicians are other important measures. Determination of drug sensitivity patterns and aggressive policy will be quite helpful. The difficulty in diagnosis could also be overcome by making laboratory facilities such as culture media available. Parry *et al* recently suggested the use of conjugate Vi vaccine as part of the Expanded Programme of Immunization [17]. The cost-effectiveness of this latter measure may however be negative for resource-poor countries, where preventive measures by way of improved sanitation and provision of potable water would be more beneficial. Above all, resources should be made available, accessible and affordable to the common man; National Health Insurance appears to be the answer to this as well as economic empowerment of the people in emerging economies like Nigeria.

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