Analysing the Incidence of Modern-Day Typhoid Fever in Population of Urban Areas

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ABSTRACT

In developing nations, especially India, typhoid fever remains a fatal illness. Even while this disease primarily affects children, it also contributes significantly to morbidity and mortality in older populations. In India, most of the cases of typhoid fever are diagnosed clinically, or at the most by the Widal test which is not fool proof. . The illness Salmonella typhi is the bacterium that causes typhoid fever, an infectious disease that is spread orally. It is typically brought on by eating tainted food and drinking dirty water. Salmonella typhi has serological positivity for the protein flagellar antigen Hd, the polysaccharide capsular antigen, and the lipopolysaccharide antigens O9 and O12. Vi. S. typhi Compared to Vi-negative bacteria, Vi-positive strains are more virulent and contagious. Fever and malaise start to appear after the 7–14 day incubation period. Chills, headache, lethargy, anorexia, nausea, nebulous abdomen pain, dry cough, and myalgia follow the fever.
Hepatomegaly, splenomegaly, painful abdomen, and Coated tongue come next.

Keywords: Typhoid fever, Widal Test , Agglutination

INTRODUCTION

Enteric fever has a long history and affects people's lives. It is brought on by the Salmonella enterica serovars Typhi and Paratyphi. The high disease burden and fatal outcomes of typhoid fever, the main routes of transmission, and the potential benefits of vaccinations are all lessons learned from historical records. According to DNA analysis of tooth pulp, the deadly epidemic that decimated half of Athens population in 430 BC marked the end of the Golden Age of Athens. Typhoid fever is now thought to be the cause of this disease.[1]. Over a century has passed since Typhoid Mary became synonymous with the disease's spread [2].

For more than a century, it has been established that contaminated water or food handling can transfer the disease from person to person. Additionally, early reports from the Anglo-Boer War (1899–1902) showed that British troops in South Africa may be protected by the inactivated vaccine that was already available, where inoculation with the dead whole cell vaccine was used was optional, and the army' intervention was unpopular because of the vaccine's react genic properties[3]. Infections with typhoid and paratyphoid are rather common in nations with inadequate sanitation and water supplies. particularly in sub-Saharan Africa, South and Southeast Asia, and Asia, where they are a leading cause of mortality and disability, particularly in children [4]. WHO prequalified the first typhoid vaccines in October 2017 after its Strategic Advisory Group of Experts (SAGE) recommended the use of typhoid conjugate vaccines in children aged 6 months to 2 years, with a catch-up campaign for children up to 15 years old, if feasible vaccination conjugate in December 2017. These advancements

prioritize access to and financing for the vaccination in low-income, typhoid-endemic nations and potentially increase the accessibility of immunizations [5].

The Characteristics of Issues

Salmonella typhi, a Gram-negative bacillus that causes typhoid fever, was a major cause of death in the developed world until it was introduced to

under strict control by public health measures
Typhoid fever kills at least 5% of people in high-transmission areas due to inadequate sanitation, poverty, overcrowding, and conflict, and such measures are still lacking in

Emerging nations. According to estimates, there are 500 000 typhoid deaths and 16 million of cases worldwide each year. The illness is typified by a protracted fever and reticulo-endothelial system (RES) bacterial proliferation. And notable inflammation of the small intestine's lymphoid organs [6, 7, 8].

Nature and History of Infection with S.Typhi

The natural history of S. typhi infection is now understood from volunteer research, animal models, and human disease observation. Macrophages lining the sinusoids of the liver, spleen, and bone marrow extract S. typhi from blood, where it can subsequently multiply in

these websites [9,10,11]. Clinical illness begins when germs re-enter the bloodstream (secondary bacteraemia). The liver then filters the organisms from the blood; a gallbladder infection with S. typhi can result in intestinal tract reinfection, where the organisms settle in the distal ileum's PP (the second exposure of PP to S. typhi), resulting in inflammation, ulceration, and necrosis (typhoid ulcers). The third week of sickness may see an ulcer-related hemorrhage, or a PP perforation may result in septicemia and widespread peritonitis, which are the leading causes of death in typhoid fever12–14. Although less than 5% of individuals experience this, the death rate is close to 40% and rises significantly (83%) if treatment is postponed for more than 96 hours15. 75% of cases are single perforations that happen after 20 days of sickness, with the terminal ileum being the typical site of perforation [12,13].

DIAGNOSIS

In the underdeveloped world, typhoid is typically diagnosed using clinical criteria. Fever lasting more than a week without a clear cause should be assumed to be typhoid until proven differently in regions where the disease is endemic. However, for differential diagnosis, encephalitis, amoebic liver abscess, malaria, deep abscess, and tuberculosis should also be taken into account. In addition, the following typhoid complications should be considered since they frequently cause confusion when diagnosing and treating the illness:

Abdominal

Gastrointestinal perforation, gastrointestinal haemorrhage, Hepatitis, Cholecystitis (usually subclinical).

Cardiovascular

Asymptomatic electrocardiographic changes, Myocarditis, Shock.

Neuropsychiatric

Encephalopathy, delirium, psychotic states, cranial or peripheral neuritis, Guillain- barre syndrome, meningitis, impairment of coordination.

Respiratory

Bronchitis Pneumonia (Salmonella enterica serotype typhi, Streptococcus pneumoniae).

Hematologic

Anaemia, Disseminated intravascular coagulation (usually subclinical), thrombocytopenia, haemolytic uremic syndrome.

Others

Focal abscess, pharyngitis, miscarriage, relapse, chronic carrier, influenza, dengue, leptospirosis, infectious mononucleosis, brucellosis, rickettsial diseases etc. should be considered.53,58

Routine blood tests

Fifteen to 25% patients show leucopoenia and neutropenia. Leucocytosis found in intestinal perforation and secondary infection.61 In younger children, leucocytosis is common association and may reach 20,000-25,000/mm3.

Felix Widal test

Over a century ago, the traditional Widal test was developed [16]. Agglutinating antibodies to S. enterica serotype typhi's O and H antigens are detected by it. The measurements of the levels are made using using sera two fold dilutions in a large test tube [17].

This test is simple to use, but its sensitivity and specificity are only moderate [18].
According to reports, its specificity is 80–95% and its sensitivity is 70–80%. Up to 30% of culture-proven cases of typhoid fever may test negative due to a weakened antibody response from previous antibiotic usage. Furthermore, there may be no discernible increase in antibody titre or detectable antibody response in typhoid patients. Regretfully, S. enterica serotype typhi shares these cross-reacting epitopes and antigens with other salmonella serotypes and Enterobacteriaceae. False positive outcomes may arise from this. A fourfold increase in the antibody titre between acute and convalescent sera is diagnostic if paired serums are available [19, 20]. The Widal test is probably the preferred test in many poor nations due to its low cost. As long as the test results are carefully evaluated in light of past history, this is permissible of typhoid, and in compliance with suitable local cut-off values for positivity assessment [21].

MATERIAL AND METHOD SETTING

Description of the study

The study will be conducted in Department of Haematology G.S.V.M. Medical College Kanpur. The goal of the study is to determine Analysing the incidence of modern-day typhoid fever in adults in urban areas, as well as its severiaty and correlation with the study participant's age sex and other widal parameters in order to ascertain the incidence of the modern day typhoid treated at the GSVM College and hospital out patient department (OPD) this study employed data from widal test conducted by Agglutination with Dilution of Sera every procedure was carried out in according with Agglutination Serological Method Protocol and Standard Operating Procedures.

Study Subjects:

Patients who came to the lab for Widal screening served as the study subjects; Typhoid patients where chosen from among them in order to determine the prevalence and conduct the additional research on the Typhoid. Patients undergoing various clinical evolutions at the referral hospitals OPD laboratories completes per 20-25 widal examination everyday out of 1236 widal completed during the data collection period (September ,October ,November 2024) 225 Typhoid individuals chosen for additional examination and research. Carried out in accordance with Widal kit methodology and normal operating procedure.

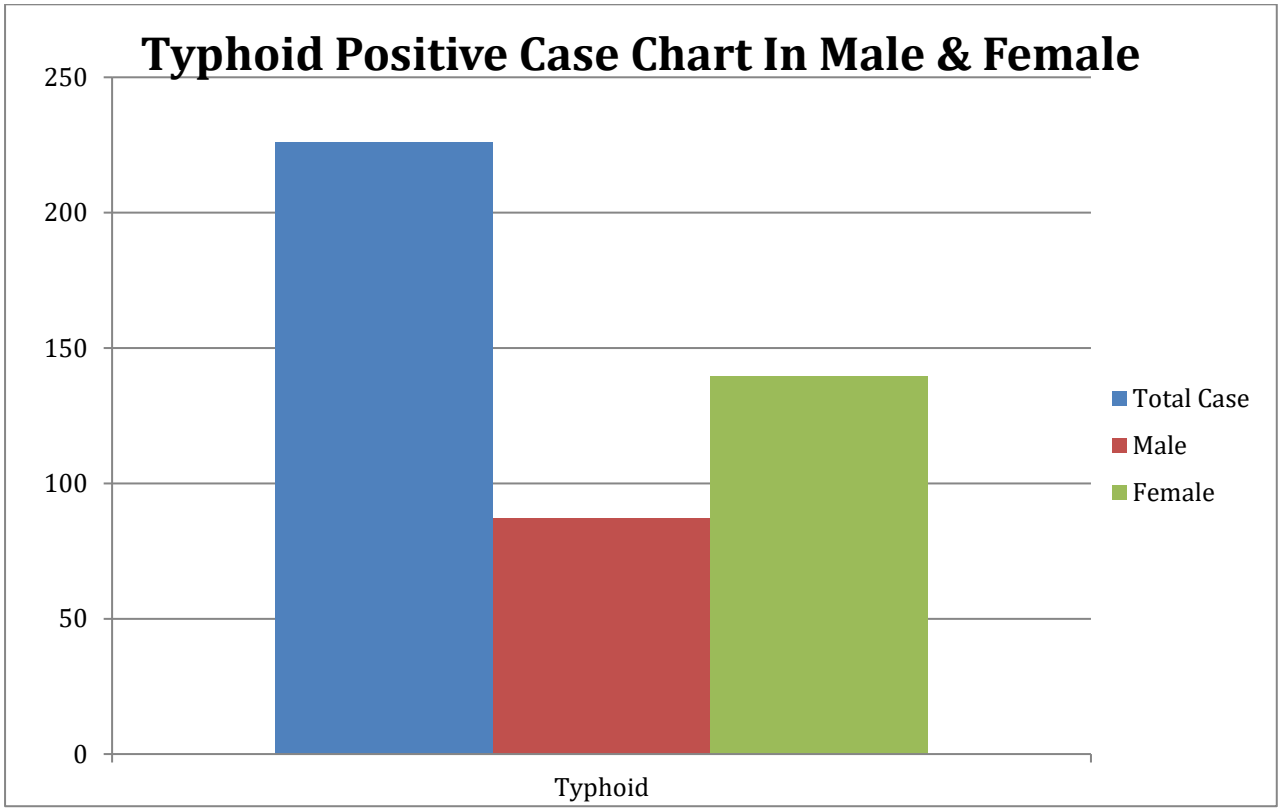
Study Design:

Study Type: Patient who came to the lab for Widal analysis were served as the subjects of the Cross-Sectional Laboratory based study

Method of the Sampling: convenient sampling was employed. Everyday' every patient widal test result was taken into account. They recruited participants one after another. After that Widal patients are chosen and the prevalence was determined the taking the number of widal patients during the study period. Patient who came to the lab served as study subjects.

Result:

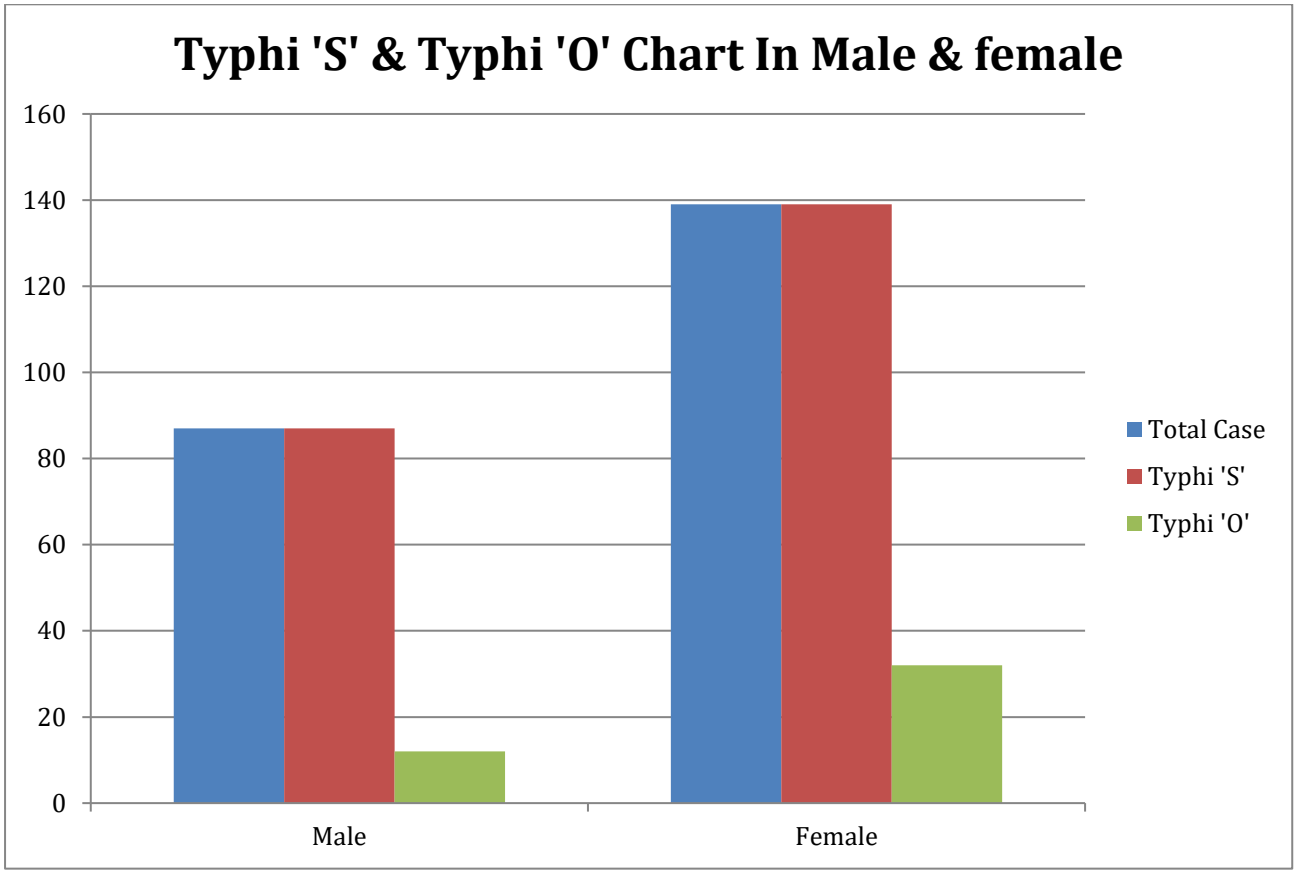
Fig. 1



The study took into account 226 typhoid patients in total of these, 61.5 % (139) were female and 38.5 % (87) were male (Fig. 1). This data is collected in the months of September-October and November of 2024.

Overall, According to the study female patients have more typhoid positive than male patients (Fig. 1).

Fig. 2



As shown in fig. 2, In male patients have 87 ‘S’ typhi and 12 ‘0’ typhi Widal positive of total case.

In female patients have 139 ‘S’ typhi and 32 ‘0’ typhi Widal positive of total case.

Conclusion

Enteric fever is still a major public health concern worldwide, especially in developing nations. According to studies, there are about 800–900 urban typhoid cases annually. Despite being accessible and affordable, the Widal test should be used carefully. We should be conscious of the fact that India and other emerging nations have higher rates of typhoid fever. Large-scale programs should be started to educate people about the need of seeing a doctor, the role of immunisations, and other preventive measures.

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