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## **EPIDEMIOLOGY OF SALMONELLA ENTERICA TYPHI AND PARATYPHI A IN INDIA**

### ***Introduction***

Typhoid fever remains an important public health problem in the world especially in the impoverished population from developing countries. Worldwide, enteric fever is most prevalent in impoverished areas that are overcrowded with poor access to sanitation. Incidence estimates suggest that south-central Asia, Southeast Asia, and southern Africa are regions with high incidence of *S. Typhi* infection i. e. more than 100 cases per 100,000 person-years. Other regions of Asia and Africa, some parts of Latin America, the Caribbean, and Oceania have a medium incidence of 10 to 100 cases per 100,000 person-years. More recent population-based studies from Latin America, in particular, are lacking, and surveillance suggests that rates have declined substantially over the past 30 years, though intermittent outbreaks continue to occur. The *Salmonella* is spread by the fecal-oral route and can be transmitted by food and water, by direct animal contact, and rarely from person-to-person. An estimated 94 % of salmonellosis is transmitted by food. Humans usually become infected by eating foods contaminated with feces from an infected animal. Furthermore, subsequent data from Africa have revealed substantial heterogeneity between countries, with some Southern and Northern African countries having very low rates i. e. < 5 cases per 100,000 person-years while several countries in Eastern and West Africa have rates > 100 per 100,000 . *S. Paratyphi A* remains uncommon in Africa, but accounts for a substantial proportion of enteric fever cases in areas of South Asia [1].

WHO estimates the global typhoid fever disease burden at 11–20 million cases annually, resulting in about 128000–161000 deaths per year. Typhoid risk is higher in populations that lack access to safe water and adequate sanitation. Poor communities and vulnerable groups including children are at highest risk. All travellers to endemic areas are at potential risk of typhoid fever, although the risk is generally low in tourist and business centres where standards of accommodation, sanitation and food hygiene are high. Typhoid fever vaccination should be offered to travellers to destinations where the risk of typhoid fever is high. The incidence rate of typhoid fever ranged from 15.3 cases per 100,000 persons 5 to 60 years old in China to 451.7 cases per 100,000 persons 2 to 15 years old in Pakistan. In the 5 to 15 year old age group, the incidence rate ranged from 24.2 cases per 100,000 persons in Vietnam to 493.5 cases per 100,000 persons in India [2].

### ***Goal***

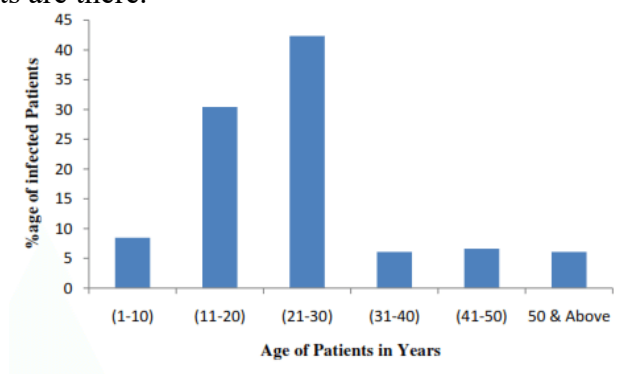
It is a review article which helps to study about the Epidemiology of *Salmonella enterica typhi* and *paratyphi A* in different states of India. Methods of retrospective epidemiological analysis and generally accepted statistical research methods were applied.

### ***Material and Methods of research***

This study was about the data of the combination of many source of informations of *salmonella* among the population of India were used, methods of retrospective epidemiological analysis and generally accepted statistical research methods were applied.

### ***The results of the research and their discussion***

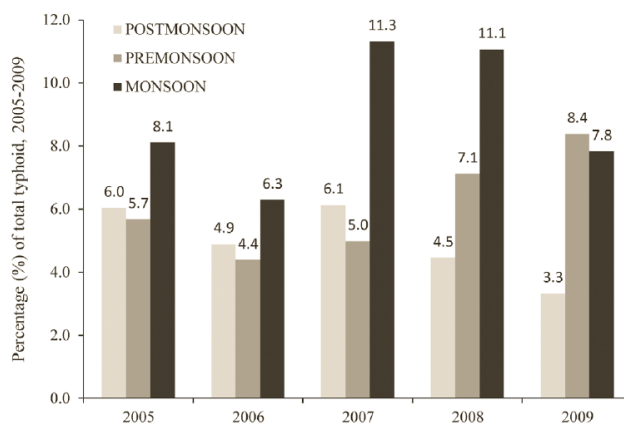
The incidence and prevalence of typhoid fever is highest in developing countries like India. Males are more commonly affected with the typhoid fever than females. The male to female ratio is approximately 1.36 to 1. It means that if males are affected 900/1000 then females will be 800/1000 in comparison among genders. The incidence of typhoid fever is highest in patients aged from 21 to 30 years (Figure 1). From one to ten years of patients are 8 %. From eleven to twenty patients are affected to 30 %. From twenty one to thirty years of patients are the highest affected in percentage of 40 %. From thirty one to forty years of age 5 % affected patients are there. From forty one to fifty 5 % of patients are affected. From fifty and above there are 5% affected patients are there.



**Figure 1 – Relation of typhoid with different age groups in Kolkata**

Because your child can get typhoid fever from drinking water or eating food that has been contaminated by the typhoid bacteria. This can happen if food or drink is handled by someone with typhoid fever or who is a carrier of the bacteria.

The incidence of typhoid fever increases with an increase in temperature and rainfall [3].



**Figure 2 – Depending upon the climatic conditions the occurrence of the typhoid in Kolkata**

In Figure 2, in monsoon season the rate of incidence of typhoid is high in Kolkata in 2008 and low in 2006; in premonsoon season the incidence rate of typhoid is high in 2009 and low in 2006; in postmonsoon the rate of incidence of typhoid is high in 2007 and low in 2009.

### ***Conclusions***

Typbar TCV is the world's first clinically proven conjugate Typhoid vaccine. Further, Typbar TCV is the only approved vaccine for children and infants less than 2 years of age [5]. Typbar TCV is a vaccine containing polysaccharide of Salmonella typhi Ty2 conjugated to Tetanus Toxoid. Results from a human challenge study carried out at University of Oxford have demonstrated that the vaccine is safe, 100 % immunogenic, and prevents up to 87.1 % of

infections, when using real life definitions of typhoid fever. Typbar TCR has been recommended by the experts at the WHO-Strategic Advisory Group for routine immunizations and is WHO prequalified.

Typhoid vaccine, 1 dose of parenteral typhoid vaccine, 3 or 4 doses of oral typhoid vaccine; the 4<sup>th</sup> dose on day 7 is an option – 4 doses may provide better protection than 3. Typhoid vaccine for children and infants less than 2 years of age is recommended. The characteristics of this vaccine will be primarily safety and efficacy and a number of other desirable features if the vaccine is to control a disease of global importance. These include cost, easy oral administration, thermal stability, multivalency and long-lived immunity[4]. Preventive measures will be like washing hands, avoid eating contaminated foods, do sanitize often and be aware of the polluted environment, cook the food and don't eat raw meat.

#### LITERATURE

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### **VACCINE PREVENTION AND PREVALENCE OF MENINGOCOCCAL INFECTION BETWEEN EUROPE AND SOUTH ASIA**

#### ***Introduction***

Globally one of the leading causes for bacterial meningitis is *Neisseria meningitidis*. The annual number of cases related to invasive meningococcal disease is estimated to be at least 1.2 million with 135,000 deaths [1, 2]. To combat meningococcal infection, an increasing number of countries have included vaccines against *N. meningitides* in their routine immunization programs [1]. These include polysaccharide and conjugate, monovalent and polyvalent vaccine against serogroups A, C, W, and/or Y, and outer membrane vesicle (OMV) vaccines against serogroup B [2, 4]. The specific vaccine use in each country depends on the predominant serogroups, cost, and availability [2]. The positive effect of these vaccines can be seen in several countries with a direct decrease in incidence rates as well as indirect benefits due to induction of herd protection [3]. This research was done to compare the impact of vaccines have had in between Europe and South Asia.

#### ***Goal***

To compare the prevalence and effective treatment of Meningococcal infection using vaccination in Europe and South Asia.