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**RESEARCH ARTICLE**

# INCIDENCE OF MALARIA AND TYPHOID IN ACUTE FEVER IN TERTIARY CARE HOSPITAL AROUND PONDICHERRY

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**ABSTRACT**

Malaria and typhoid are major aethiological considerations in both acute and prolonged fever of unknown origin in the tropics. The present study investigated the incidence of malaria and typhoid in acute fever and their commonest cause. A total of 108 blood samples collected from patients presenting febrile condition suggestive of malaria and typhoid fever and analyzed using standard microbiological techniques. The result revealed that typhoid (32.40%) is more prevalent than malaria (10.80%) in acute fever. Antigen detection kit method (72.72%) is more sensitive than peripheral blood smear (27.27%) for detection of malaria. In conclusion, typhoid fever is more common in acute fever due to poor hygiene practice .HRP2-based RDT has shown superior sensitivity compared to microscopy in diagnosis of malaria and may be more suitable for screening of malaria infection.



## INTRODUCTION

Majority cases of acute fever are due to malaria and typhoid fever. In the developing countries infectivity and mortality rate is high due to malaria and typhoid fever. It is due to poor sanitation, contaminated drinking water and improper drainage system, which is one of the major causes that increase the mosquito population.

Typhoid fever is an acute systemic infection caused by the bacterium *Salmonella enterica sub-sp enterica serotype typhi*. The disease is transmitted by the ingestion of contaminated food or drinking water [T. Butter *et al* 2002]. It is a systemic infectious disease characterized by an acute illness, the first typical manifestations of which are fever, headache, abdominal pain, relative bradycardia, splenomegaly, and leucopenia. [R. D. Pearson *et al* 2000] Typhoid fever is endemic in India. It is estimated that there more than 13 million cases of typhoid fever occurring annually**.** The incidence is highest in children and young adults between 5 and 19 years old. Human beings are the only reservoir and host for typhoid fever. [WHO, 2007]

On other hand, malaria is a vector borne infectious disease caused by a eukaryotic species of the genus Plasmodium. It is wide spread in tropical and subtropical regions at altitudes below 1500mts including parts of America, Africa and Asia.[ Davidson] Plasmodium species can infect and transmitted by humans (*P. falciparum,P. vivax,P. ovale and P. malariae)*

Malaria is transmitted through the bite from an infected female Anopheles mosquito. Which introduces the organisms from its saliva into a person's circulatory system. *P. falciparum* is the most common cause of infection and is responsible for about 80% of all malaria cases. It is responsible for about 90% of all malaria deaths. [Caraballo H *et al*, 2014] The presentation may include headache, fever, shivering, hemolytic anemia, jaundice, hemoglobin in the urine and convulsions.

Malaria and typhoid fever are among the most epidemic disease in the tropics, causing significant morbidity and mortality [Smith DC *et al* 1982]. An association between malaria and typhoid fever was first described by Dr. J .J. Word Ward. It was named typhomalarial fever. [Ammah A *et al* 1999] Although typhoid fever and malaria are caused by different agents and transmitted via different mechanism, both diseases shared rather similar symptomology. However the precise incidence of the two infections is uncertain. O antigen of salmonella typhi was markedly reduced in acute episode of malaria compared with controls have humoral immunity is transiently impaired.

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Malaria may predispose to gram negative bacilli which has been seen in hemolytic disease caused by sickle cell disease and bartonellosis. Hence, the present study is about the incidence of malaria and typhoid in acute fever and to evaluate the commonest cause of acute fever amongst malaria and typhoid.

## MATERIAL AND METHODS

The present study on incidence of malaria and typhoid in acute fever are carried out at Microbiological section of Clinical laboratory of Sri Lakshmi Narayana institute of Medical sciences, Puducherry.

During the period of August 2013 to May 2014. A total of 108 blood samples of clinically suspected cases of acute fever with symptoms of fever, headache, vomiting, diarrhea and abdominal discomfort were included in this study.

**Sample Collection**

About 5 ml of blood samples were aseptically collected by capillary and venous blood from patients of different age groups. After that, the collected sample was analyzed by the Microscopic method, Malaria antigenic kit method and Widal agglutination test.

**Microscopic examination of blood samples**

A thick blood film for each blood sample was made on clean grease-free glass slide and stained by the leishman stain technique. Just before use, the commercially prepared leishman stain was diluted 1 in 10 by adding 5 ml of stain to 45 ml buffered distilled water (pH 7.0) and mixed. The blood films were flooded with freshly diluted leishman stain for 10 minutes. The stain was then washed off and slide allowed to air-dry in a draining rack after the underside was cleaned with cotton wool. The dried smear was examined on atleast 100 high powered microscope fields before considered as negative. The presence of any peripheral parasitaemia at least one per 100 thick fields was considered significant as the entire patient presented with fever.

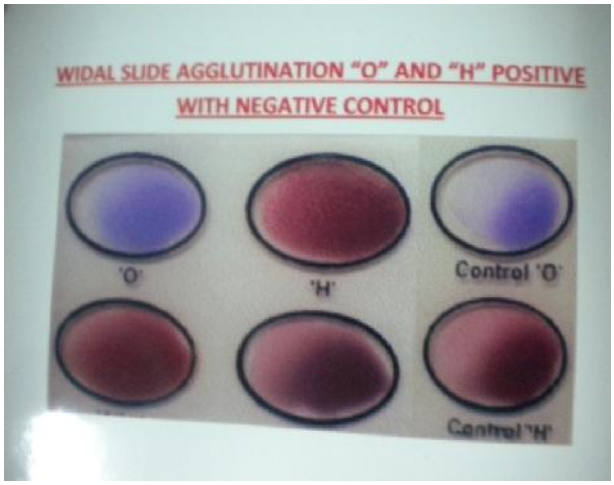
**Malaria antigenic kit method**

A drop of each participant's blood was dropped onto the sample well of the kit after which two drops (60µl) of assay buffer was added into the buffer well and the results read in 20 minutes at room temperature.

A positive reaction was identified by the presence of two rose-pink colour bands at the control (C) and test (T) labels. A visible rose-pink label at the control (C) label only was indicative of a negative reaction.

**Widal Agglutination Test**

Widal agglutination test was performed on each blood sample using the Widal agglutination kit (Biotech lab, United States) containing somatic (O) and flagella (H) antigens of *Salmonella typhi*, *Salmonella paratyphi* A and *paratyphi* B. A negative saline control was introduced into each batch of test. The procedure used was described by Ochei and Kolhatkar. [8]. Drops of sera from each patient were made on a clean tile, mixed with the antigens rocked for 3 minutes and observed for agglutination. A Widal test was considered as positive if the reaction titre is 1/80 or greater in a single test




## RESULTS

A total of one hundred eight febrile patients were screened for malaria and typhoid.

**Table 1**Age wise distribution of patients

| Age (in years) | No. of patients (%) |
|---|---|
| 1-10 | 6 (6.5%) |
| 11 – 20 | 40 (43.2%) |
| 21 – 30 | 39 (42.1%) |
| 31 – 40 | 9 (9.7%) |
| 41 – 50 | 6 (6.5%) |
| 51 – 60 | 3 (3.2%) |
| >60 | 5 (5.4%) |
| Total | 108 |

According to this table, acute fever was most commonly seen in the age group 11-20 yrs (43.20%) followed by others.

**Table 2** Malaria and Widal positivity

| Type of fever | No of Patient | Positivity |
|---|---|---|
| Malaria | 108 | 11(10.8%) |
| Widal | 108 | 35(32.40%) |

It was observed that typhoid fever 35 (32.40%) cases were positive out of 108 fever cases and Malaria positive cases were 11 (10.80%) out of 108 fever cases. The reason may be due to contaminated food or water utilized by the general population.

**Table 3** Age wise Distribution of WIDAL Positivity

| Age (in years) | No. of patients | Widal Positive (%) |
|---|---|---|
| 1-10 | 6 | 1 (16.66%) |
| 11-20 | 42 | 15(35.7%) |
| 21-30 | 25 | 10(40.00%) |
| 31-40 | 16 | 7(43.75%) |
| 41-50 | 10 | 2(20.00%) |
| 51-60 | 4 | 0(0.00%) |
| >61 | 5 | 0(0.00%) |
| Total | 108 | 35(32.40%) |

Out of 108 total cases screened, the incidence of typhoid fever is highest in the age group of 31-40 yrs in which 7 cases were positive out of 16 cases screened i.e. 43.75% followed by others.

**Table 4** Geographical distribution of typhoid fever

| Area | Total no. of samples tested | Widal positive (%) |
|---|---|---|
| Urban | 64 | 23 (35.93%) |
| Rural | 44 | 12 (27.27%) |

The prevalence of typhoid fever is more common in urban areas compared to that of rural areas

Out of 108 total cases screened, malaria incidence is highest in age group 11-20 yrs in which 4 cases were positive out of 40 cases screened i.e. (10%) followed by others

**Table-6** Comparison of Malaria Ag and Smear in screening Patients

| Total No of Patients | Total Malaria Positive | Malaria Antigen Test positive | Malaria Smear Positive |
|---|---|---|---|
| 108 | 11(10.18%) | 8(72.72%) | 3(27.27%) |

Total patients screened with these two methods were 108. Out of them only 11 patients were positive with malaria in which 8 were shown positive by Malaria Antigen kit method and 3 were shown positive with Microscopic examination.

**Table 7** Geographical distribution of Malaria

| Area | No of Patients | Malaria Positive |
|---|---|---|
| Urban | 64 | 7(10.93%) |
| Rural | 44 | 4( 9.09%) |
| Total | 108 | 11(10.18%) |

The prevalence of malaria is more in urban areas compared to that of rural areas.

## DISCUSSION

Malaria and typhoid fever infections continue to be major diseases of public health problem. In worldwide typhoid fever affects about 17 million with more than 6, 00,000 deaths a year. Each year, around 150 to200 cases of typhoid are reported in England and Wales. [Ritabrata kundu *et al* 2006]

Almost 80% of cases and deaths are in Asia and most occurs in Africa and Latin America. In UK typhoid fever has been brought very close to eradication with approximately one case per 10,00,000 population, which is perhaps the lowest incidence of typhoid fever in the world. Since 1950 the organism's resistance to antibiotics has been a growing problem, by 1989 resistance was reported in a number of countries particularly in Asia and the Middle East .Resistant strains have caused out breaks of diseases in India and Pakistan in recent years.

It is prevalent in the tropical countries like Sub-Saharan Africa, because rain fall, warm temperatures and stagnant waters provide habitats ideal for mosquito larva. The childhood deaths resulting mainly from cerebral malaria and anemia constitute nearly 25% of child mortality in Africa.

The WHO has estimated that in 2010 there were 219 million documented cases of malaria. The majority of malaria related morbidity and mortality happen in young children. It's commonly associated with poverty and also major hindrance to economic development. [A. C. Nwuzo *et al*, C. J. Uneke, 2008, E. Worrall *et al* 2005, G. M. L. Nayyar,-2012]

## CONCLUSION

Acute fevers are commonly seen in the age group between 11-30years (85.3%).They were more commonly caused by Malaria and typhoid (43.2%). Typhoid fever (32.40%) is more prevalent than malaria (10.8%) in acute fevers in Out Patient Department of General Medicine. Typhoid cases were more positive in urban (35.93%) than rural (27.27%) areas. In acute fever, malaria is commonly seen in the age group between 11-30years (20.25%).All acute fever cases were screened for malaria with Antigen detection kit (72.72%) and peripheral blood smear (27.27%). Malaria cases were more positive in urban (10.93%) than rural (9.09%) areas due to urbanisation. Typhoid fever is more common in acute fever due to poor hygiene practice. HRP2-based RDT has shown superior sensitivity compared to microscopy in diagnosis of malaria and may be more suitable for screening of malaria infection in routine practice in primary health care centres.

## References


1. Ammah A, Nkujo-Akenji T, Ndip R, Deas JE. An update on concurrent malaria and typhoid fever in Cameroon. *Trans R Soc Trop Med Hyg* 1999; *2:* 127–9.
2. C. Nwuzo, R. A. Onyeagba, I. R. Iroha, O. Nworie and A. E. Oji, —Parasitological, bacteriological and cultural determination of prevalence of malaria parasite (Plasmodium falciparium) and typhoid fever co-infection in Abakaliki, Ebonyi State, Scientific Research and Essay, vol. 4, no. 10, pp. 966-971.
3. Caraballo. H 2014,Emergency Department management of mosquito borne illness http://en.wikipedia.org/wiki/malaria#cite-note-20
4. Davidson-Principle and practice of medicine-20th edition –Elsevier.
5. E. Worrall, S. Basu and K. Hanson, "Is malaria a disease of poverty? A review of the literature", Tropical Health and Medicine, vol. 10, no. 10, pp. 1047–1059, 2005.
6. G. M. L. Nayyar, J. G. Breman, P. N. Newton and J. Herrington, "Poor-quality antimalarial drugs in southeast Asia and sub-Saharan Africa", Lancet Infectious Diseases, vol. 12, no. 6, pp. 488–96, 2012.
7. J. Uneke, —Concurrent Malaria and Typhoid Fever in the Tropics: the Diagnostic Challenges and Public Health Implications‖, *Journal of Vector Borne Diseases*, vol. 45,pp. 133-142, 2008.
8. R. D. Pearson and R. L. Guerrant, —Enteric fever and other causes of abdominal symptoms with fever In:

G. L. Mandell, J. E. Bennett and R. Dolin, editors, Principles and Practice of Infectious Diseases, V edition, New York: Churchill Livingstone, pp. 1136-1150, 2000.

9. Ritabrata kundu *et al* 2006 Diagnosis of enteric fever in children, *Journal of Indian Pediatrics*.43:875-883.
10. Smith DC. The rise and fall of typhomalarial fever. I: origins. *Hist Med Allied Sci*1982; *37:*182–220.
11. T. Butter, ―Typhoid fever In: J. B. Wyngaargen, L. H. Smith, J. C. Bennett, editors. ―Cecill Textbook of Medicine‖, XIX edition, Philadelphia, U.S.A: W.B.Saunders Co., pp. 1690-1692, 2002.
12. Typhoid Fever". World Health Organization. Retrieved 2007-08-28.

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