

Suspected Case Of Typhoid Fever In A 9 Months Old Boy With Negative Widal Test

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Abstract

We report a case of 9 months old boy with typhoid fever and negative Widal test and no malaria parasites were observed through microscopy and rapid diagnostic test. This case highlights a typical clinical scenario of the management of febrile children in resource limited setting. He presented with fever, chills, vomiting, diarrhoea, cough and difficulty in breathing. With the non-availability of the sensitive Amikacin and Cefotaxime, Ceftriaxone therapy was used and the patient recovered. Diagnostic bottlenecks, antibiotics resistance and antibiotics availability are some major challenges observed in the management of bacterial infections in resource poor settings.

INTRODUCTION

In areas where malaria is endemic like in sub-Saharan Africa, bacterial infection still pose a strong threat to the health of children especially those under the age of 5 years [1]. Typhoid fever is a bacterial disease caused by *Salmonella enterica* serovar Typhi, with over 20 million infections and 200,000 deaths globally each year [2-4]. Despite its global incidence, it is considered to be associated with low socio-economic settings and poor hygiene, archetypal of many communities in sub-Saharan Africa. Non-typhoid salmonella (NTS) and Typhoid salmonella are among the four common bacteria isolates in sick febrile children in Ghana. NTS is the commonest bacteria found especially among children less than 1 year while *Salmonella typhi* is the least found bacteria in blood culture and common in children between 2 and 3 years [5].

The clinical presentation of typhoid fever in children cannot be differentiated from other causes of febrile illness and a laboratory diagnosis is difficult even in most tertiary health care facilities. Widal test is very much employed in the diagnosis of typhoid fever despite the technical flaws that surrounds the test. We describe a case of negative Widal test in 9 months old boy with *Salmonella typhi* infection sensitive to unavailable drugs Cefotaxime and Amikacin.

CASE

A 9 months old boy presented in the late evening to the

Jemima hospital Takoradi, Ghana with diarrhoea and vomiting which started in the morning. The child was looking generally and adequately nourished with a weight of 9 kg. The patient was treated for malaria and gastro-enteritis, with injection artemether 40 mg start and some rehydration fluids. The patient was kept overnight and discharged the next morning after his conditions improved, with a 3 days course oral syrup artemether lumefantrine, flagyl for 5 days and multivitamin. The child was brought back to hospital a week later with fever, chills, vomiting, diarrhoea, cough and difficulty in breathing which started 3 days before presentation (4 days after being discharged from hospital).

On examination, the child was pale, lethargic and warm to touch with a temperature of 37.9 oC. Respiratory rate was 42 /min with crackles on the chest. Abdomen was scaphoid with spleen 2 cm below the costal margin. Blood was taken for full blood count or complete blood count (CBC), Widal test, malaria parasite diagnosis and blood culture. All diagnoses were non-automated but were done by routine conventional method at a laboratory. Slide agglutination method was employed for the Widal test using commercially available antigens of *S. typhi* (BioSystems, Remel Europe Ltd, UK). Blood culture was done using brain heart infusion agar (Lab M Limited, UK) Full blood count revealed a white cells count (WBC) of 22 x 10⁹/L (normal range: 4.5 and 11.0 X 10⁹ cells/L, Haemoglobin (HB) 9.7 g/dl (normal range: 9.5-20.5 g/dl, Platelet count (PLTH) 659 x 10⁹/L (normal

range: 150-450 X 10⁹ /L). Blood Widal test was negative and no malaria parasites were observed through microscopy and Plasmodium falciparum specific rapid diagnostic test (Premier Medical Corporation Ltd). Whilst awaiting result for blood culture, which usually takes close to 2-4 days, the child was treated for bronchopneumonia and sepsis with IV crystalline penicillin 0.5 mega unit 6 hourly and IV gentamicin 25 mg 8 hourly. The patient got better after 72 hours of treatment and was discharged home. Six days later, the patient came again to the hospital with fever that started 2 days prior to presentation. The mother also came with the result of the blood culture which revealed a bacterial growth of Salmonella typhi sensitive to Amikacin and Cefotaxime and resistant to Chloramphenicol and Cefuroxime. Amikacin and Cefotaxime were not readily available, as the hospital and other pharmacy shops in town didn't have the drugs. Intravenous Rocephin (Ceftriaxone) injection 500 mg 12 hourly for 7 days was commenced. Temperature started settling on the fourth day of treatment and the child was very much better on the seven day. He was discharged the next day after completing the treatment. The child was seen at follow up in the outpatient department a month and two weeks after discharge free from fever and thriving very well.

DISCUSSION

This case highlights a typical clinical scenario of the management of febrile children in resource limited setting. Despite World Health Organization (WHO) recommendation that all suspected cases of malaria should be tested, most febrile children are still treated for malaria without laboratory diagnosis of malaria in many areas where malaria is endemic [6,7]. In this case under review laboratory diagnosis was not made during the first visit of this child but rather a presumptive malaria diagnosis and treatment. Presumptive diagnosis and treatment for malaria is a common practice by physicians in rural developing settings where malaria is endemic. The laboratory test about a week after the first presentation didn't show malaria parasitaemia suggesting that the first presentation might not be due to malaria after all or perhaps as a result of the initial treatment for malaria in the first admission. This underlines the danger of over diagnosis and treatment of malaria as it might allow equally fatal bacterial and viral infections go undetected and untreated with dire consequences [6,8,9].

Bacteremia diagnosis was a challenge in this case as the only initial non-specific indication of bacteremia was the high white cell count. This challenge is very typical in most resource poor setting in sub-Saharan Africa where

microbiology facilities are rare and blood culture do not provide result within the first 48 hours when most deaths in children occur [6,10-12]. Also in the case, the mother brought the culture result to the physician; this is also a common practice in rural developing settings where the laboratory is not in close proximity with the hospital or clinic; in addition to the absence of computerized network for prompt delivery of result as with the practice in developed settings. Widal test is heavily relied upon as a diagnostic test for typhoid fever in sub-Saharan Africa despite issues regarding its specificity and sensitivity [13,14]. It is a serological agglutination test involving reaction of antibodies in typhoid infected patients with commercial available Salmonella typhi antigen. There is cross reactivity issue as antibodies produced by non-typhoidal organisms can react with the typhoid specific antigen. For optimal use of Widal test, acute serum should be tested after 6-8 days of illness or two sera samples taken 1 week apart looking for 4 fold increases in antibody titre [14]. However, in this case the Widal test was negative but the blood culture yielded growth of Salmonella typhi. This false negative might be due to error in technique, poorly standardized antigens, or previous use of antibiotics by the patient [13]. Conversely, it could be due to error or mix up in blood culture diagnosis, since infection with Salmonella typhi, is not associated with elevated or increase in the WBC as seen in this case; hence leaving the room for other gram negative enteric pathogens to be suspected.

Ceftriaxone was used in the treatment of the typhoid in this case although it is not in the list of sensitive/resistant drugs used in the culture and sensitivity. This was necessary as the sensitive drugs; Amikacin and Cefotaxime were not available. Also, Ceftriazone can be assumed to be susceptible since the isolate was reported for susceptibility to Cefotaxime. Another major reason is that ceftriaxone is a very effective and a standard care for typhoid worldwide [15]. In conclusion, this suspected case of typhoid fever may not be due to infection with Salmonella typhi which causes Typhoid fever but rather as a result of infection with non Typhoidal or other gram negative enteric bacilli due to diagnostic and therapeutic clues for Typhoid fever that are critically missing in this case. There are numerous challenges in the management of bacterial infections in resource poor settings, ranging from diagnostic bottlenecks and antibiotics resistance and availability. Despite these challenges effort should be made to minimize these challenges and provide best and practical clinical protocol that can help the physician provide adequate management

for the child with bacterial infection.

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