



Fatal Human Babesiosis in a Nine-Year Old Nigerian Girl

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Authors' contributions

This work was carried out in collaboration among all the authors. Authors MMA and YM designed the study and wrote the protocol. Author MMA wrote the first draft of the manuscript. Authors NMJ, BJ, SMZ, JFL, FA and AKJ did the literature searches and manuscript editing. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Background: Babesiosis is a rare emerging opportunistic disease in humans. It is a zoonotic disease caused by protozoan parasites of the genus *Babesia* and transmitted by Ixodid tick vector. It is often incidentally diagnosed because of its rarity but may be severe or fatal in presentation, particularly in immunocompromised hosts.

Aim: To report the clinical presentation of a fatal case of human babesiosis in a nine-year old girl with retroviral disease, in Sokoto, Northern Nigeria.

Case Report: A nine-year old girl presented with a month history of unremitting fever, cough and weight loss, There was no history of contact with someone with chronic cough and no diarrhoea. She was diagnosed to have retroviral disease (RVD) at age of three (3) years consequent to her mother's positive test but only the mother was on antiretroviral treatment, due to the claim that the child had remained healthy. Review of her blood film during third week of admission revealed

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characteristic tetrads (maltese-cross formation) pathognomonic of babesial infection. She was started on anti-babesial treatment with quinine and clindamycin. She succumbed to the illness within second week of anti-babesial treatment.

Conclusion: This report suggested that babesiosis should be a high index of suspicion especially in immunocompromised patients with persistent fever.

Keywords: Babesial infection; human immunodeficiency; Sokoto; tick vector.

1. INTRODUCTION

Babesia is a zoonotic, intraerythrocytic parasite transmitted to humans either by ticks or via infected blood and blood products. Human babesiosis is reported to be endemic in Northeast America [1] but only sporadic human infections have been reported in Africa, Asia, South America and Europe [2-5].

Gonzalez, et al. [6] reported a prevalence of human babesiosis of 2% among humans engaged in cattle raising and residing in malaria endemic regions of Columbia. Zhou, et al. [7] also reported a prevalence of 2.2% among febrile patients in Yunan, China. No similar prevalence report was found in Africa.

Babesia microti and *B. duncani* [8] are the commonly reported species causing human babesiosis and the infection is confirmed by identification of the organism on Giemsa or Wright's stained blood smears, showing intraerythrocytic tetrads of merozoites, arranged in 'maltese cross' pattern. This appearance is pathognomonic of babesial infection. The detection of babesial DNA by polymerase chain reaction (PCR) is confirmatory. Typical symptoms in moderate to severe babesial infection include intermittent fever, chills, headache, myalgia, fatigue, nonproductive cough, anorexia and weight loss [9]. Hepatosplenomegaly is an uncommon finding.

Treatment of human babesiosis may be difficult due to the relapsing nature of the disease particularly in persons with immunocompromised states. There is paucity of data on human babesial infection in Africa, and to the best of our knowledge this report is the first of its kind on human babesiosis in a child in Nigeria.

Therefore, we are reporting this case because of its rarity and the likelihood that clinicians may miss the diagnosis without high index of suspicion, and the need for multidisciplinary approach in the diagnosis.

2. CASE REPORT

A nine-year old girl was presented to a neurology clinic for a follow-up on her unresolved post-infectious neurologic sequelae (loss of walking ability, aphasia and seizures) following a suspected meningitis which she had two-years previously.

She presented with a month history of unremitting fever, cough and weight loss. There was no history of contact with someone with chronic cough and no diarrhoea. Her symptoms were not responsive to many antibiotics including oral amoxicillin, septrin, augmentin and ciprofloxacin (at different periods) and anti-malarials that were given at a General Hospital. She had been on anticonvulsants namely sodium valproate and levetiracetam for her seizures with good control.

She was diagnosed to have retroviral disease (RVD) at age of three (3) years consequent to her mother's positive test, at a General Hospital but her parents concealed this information! However, only the mother was on antiretroviral treatment, due to the claim that the child had remained healthy. Father had remained RVD negative.

Systemic examination revealed an acute on chronically ill-looking girl, wasted (weight for age 65%), in mild respiratory distress, moderately pale, febrile (38.7°C) with oral thrush. She had tachypnea and fine crepitations on chest examination as well as the pre-existing global hypertonia and hyperreflexia.

She was admitted and initially managed for suspected atypical bronchopneumonia and multi-drug resistant malaria but there was no fever remission up to the third week of admission. Her chest X-ray showed hilar patchy opacities and screening tests for tuberculosis including GeneXpert were not remarkable. Retroviral screening was reactive and subsequent blood films for malaria parasite were consistently negative after initial two positive results. Blood culture yielded no growth and complete blood count showed normal white blood cell count

($10.5 \times 10^9/L$), 74.1% granulocyte, and a haematocrit of 18.3% (Haemoglobin of 6 g/dL).

Further review of her blood film at third week of admission revealed characteristic tetrads (maltese-cross formation) pathognomonic of babesial infection (Fig. 1a & 1b). She had blood transfusion and was started on anti-babesial treatment with intravenous quinine (10 mg/kg 8 hourly) and oral clindamycin (10 mg/kg 8 hourly). The fever and cough persisted and she succumbed to the illness within second week of anti-babesial treatment.

3. DISCUSSION

Human babesiosis is mainly transmitted by Ixodid (black-legged) tick vector. However, many cases of transfusion-associated *B. microti* infections have been reported from New York and parts of North America [1,10]. Our patient had no history of previous blood transfusion, thus tick-borne transmission is likely although the possible risk of contact with ticks was not established. The clinical presentation of babesial infection is clinically and diagnostically similar to that of malaria, [3,11,12] which is often mild or

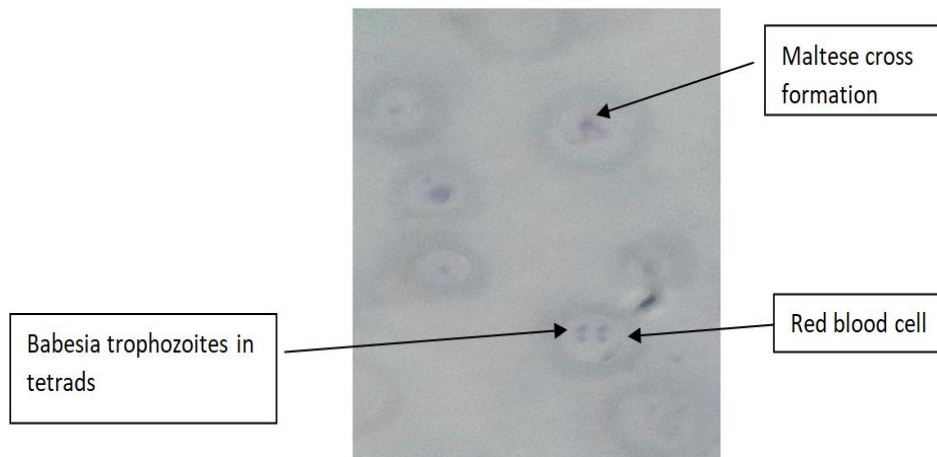


Fig. 1a.

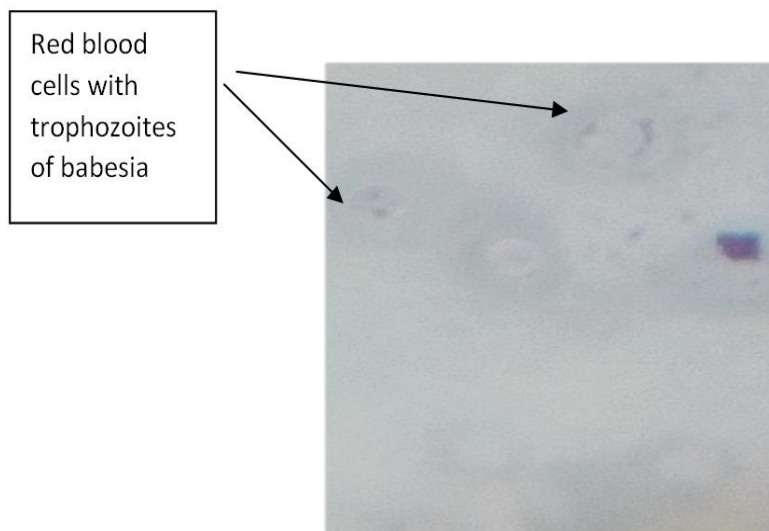


Fig. 1b.

Fig. 1a & 1b. Characteristic tetrads (maltese-cross formation) pathognomonic of babesial infection

subclinical in immune-competent individuals. However, the presentation could be severe or fatal if there is associated immunosuppression irrespective of the age [13]. Typical symptoms in moderate to severe infection include intermittent fever, chills, headache, fatigue, myalgia, arthralgia, nonproductive cough, shortness of breath and weight loss [9]. The symptoms may last for weeks or months in severe cases.

Diagnosis of human babesia infection requires high index of suspicion especially in immune-compromised patients with longstanding fever that is not responsive to conventional antimalarials/antibiotics as demonstrated in this case. Moreover, due to low babesial parasitaemia in the early stage of the disease, it is advised that at least up to 300 microscopic fields should be reviewed before reporting a negative smear [11].

Treatment is through a combination of antimicrobial clindamycin with quinine (for severe cases) or atovaquone and azithromycin (for mild to moderate) infections, [2] given up to six-weeks in relapsing cases. Reported complications are mainly due to haemolytic anaemia, organ failures such as acute respiratory failure, renal failure, congestive cardiac failure and disseminated coagulopathies [1,2,4,9] Mortality may be up to a quarter of cases in immune-compromised patients, despite treatment. Outcomes may be improved by early diagnosis and prompt treatment of cases [9]. There is no effective vaccine against babesial infection. Thus, prevention is by avoiding tick-prone habitat (woody and grassy areas) and the use of protective clothing and sprays in endemic areas [14].

4. CONCLUSION

This report highlighted the clinical presentation of human Babesiosis, a rare opportunistic infection that was presented in its severe or fatal form in an immunocompromised girl. The diagnosis was delayed due to the malaria-like presentation. Therefore, a high index of suspicion is needed especially in immune-compromised patients.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard, written approval of Ethics committee has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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