

History of human African trypanosomiasis transmission by out-of-home blood transfusion : about a case in Chad in 2015

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DOI: 10.29322/IJSRP.14.02.2024.p14628

<https://dx.doi.org/10.29322/IJSRP.14.02.2024.p14628>

Paper Received Date: 12th January 2023

Paper Acceptance Date: 14th February 2024

Paper Publication Date: 21st February 2024

I. INTRODUCTION

Human African trypanosomiasis or "sleeping sickness" is a fatal disease caused by *Trypanosoma brucei gambiense* and *Trypanosoma brucei rhodesiense*; transmitted by tsetse flies (Glossins) (1). There are two clinical forms: the chronic form, due to *T.b. gambiense*, found in West and Central Africa (98% of current cases); and the acute form, due to *Trypanosoma brucei rhodesiense*, in East and Southern Africa (remaining cases). According to WHO, an estimated 60 million people in 36 African countries are at risk. In 2009, the number of reported cases fell below 10,000 for the first time in 50 years, followed by 977 cases in 2018 (2). The disease evolves in a well-defined geographical area called "foci" where the vector, the parasite and humans cohabit. Human African Trypanosomiasis is found only in sub-Saharan Africa, in rural populations that depend on agriculture, fishing, livestock or hunting (3).

In Chad, five historical foci exist, three of which are currently active, including the one in Mandoul (3). Each year, dozens of people are treated in these homes. Diagnostic facilities and treatment are available and free of charge at the health facilities in the foci (4).

Although transmission is vectorial and given that the parasite circulates in the blood, it is possible that other ways of contamination exist through contact with parasitized blood. Although rare, little literature has been published on the subject. The study we have conducted is a true story of a case of transmission of Human African Trypanosomiasis by blood transfusion outside the home. We will try to analyze this situation in the context of the modes and risks of transmission in a zone free of Human African Trypanosomiasis. The result of this work will allow us to define a strategy for the control of the disease outside the so-called risk areas.

The general objective of this work was to analyze the history of transmission of Human African Trypanosomiasis by blood transfusion outside the risk zone in Chad in 2015.

More specifically, we need to : describe the socio-demographic and professional characteristics of the family ;

analyze the family's history of blood transfusion ; report the results obtained and relate them to the history ; report the results of the investigation around the household in search of cases ; and finally report the conclusion of the situation analysis.

II. METHOD

This is a descriptive observational study on the history of a clinical case observed in a health facility at the focus of Human African Trypanosomiasis.

Our study took place in an urban health center in the Bodo health district, in the Mandoul focus of Human African Trypanosomiasis in Chad. The Mandoul outbreak is one of the most active outbreaks of Human African Trypanosomiasis of the five outbreaks historically under surveillance. Formerly known as the Bodo outbreak, the Mandoul outbreak is located in southern Chad, 50 km from the city of Doba (capital of the region), and 150 km from the city of Moundou (economic capital and home of the national program to control Human African Trypanosomiasis in Chad). This area includes 45 villages and camps over an area of about 15 km wide and 20 km long. It takes its name from its position astride the semi-permanent river called "Mandoul", which groups two provinces : Logone Oriental and Mandoul (3).

III. RESULTS

Socio-demographic and professional characteristics

The girl was four years old at the time of the study (born on April 6, 2011), of Chadian nationality, with a mother who was a housewife and a father who was a shopkeeper (owner of a liquor store and a dance bar). The girl and her family lived in Koumra, capital of the Mandoul region, a town free of Human African Trypanosomiasis, located at least 100 km from the outbreaks. The girl is the fifth child in a sibling group of five, all of whom are alive and in apparent good health. She is not in school and has never been out of town (according to her parents).

The immunization schedule of this patient was completed at the Mother and Child Protection Center in Koumra. We report a

fracture in the left leg, the patient was hospitalized between February-March 2015, then in May 2015, she underwent a blood transfusion made at the hospital in Koumra.

The mother of the girl, aged thirty, housewife and sometimes exercises small trade in the city. During her pregnancy, she followed all her required prenatal consultations correctly. She has five living children and has lived in the city for over twenty years. The girl's father has been a resident of this city for over thirty years. He confirms that his daughter has never left the city since her birth. His half-brother, 22 years old, a student and farmer at times, left the family during the vacations to stay in the endemic village (Danamadja in the Mandoul household) for field work.

Analyze the family history in relation to blood transfusion

For several years, the girl had only been suffering from malaria and treated. The history of the transfusion began at the beginning of 2015, when the girl had a persistent fever associated with a general asthenia. This motivated a consultation in February 2015 in an urban health center in the city of Koumra, then at the hospital in Koumra. The diagnosis of malaria was found and treated, then a complication by severe anemia was found and required a blood transfusion. The blood transfused was that of his half-brother.

Three months later, the half-brother had fallen ill in the endemic village where he was staying for field work. Given the clinical symptoms, the village suspected human African trypanosomiasis, and the half-brother was transported to the Catholic health center in Bodo. The diagnosis of human African trypanosomiasis at stage 2 was found (the Rapid Diagnostic Test for human African trypanosomiasis was positive, lymph node puncture showed trypanosomes and lumbar puncture revealed a large number of cells (400 cells per microliter). He was hospitalized and treated for 10 days (May 28 to June 06, 2015).

Report the results obtained and make the link with the story

Towards the end of August 2015, the girl presented with unexplained hyperthermia, followed by physical asthenia, not normal behavior and especially daytime hypersomnia. It is in front of the persistence of the symptoms, that the parents decided to take her to consult on August 25 at the Catholic health center of Bodo for human African trypanosomiasis. A rapid the Rapid Diagnostic Test for Human African Trypanosomiasis was performed and found to be very suspicious. Clinical examination showed cervical lymph nodes, and a lymph node puncture was performed and showed trypanosomes under the microscope hence the confirmation of human African trypanosomiasis. The lumbar puncture, which is a phase examination, was performed and showed 187 cells/microliter and the patient was classified as having phase 2 disease. She was hospitalized and treated with the combination therapy nifurtimox-eflornithine like her half-brother from August 26 to September 06, 2015 at the Bodo Catholic Health Center. Further checkups were performed and found associated malaria, then treated as well. It should be noted that southern Chad is endemic for malaria. This disease had occurred only six or seven months after the transfusion of blood from his sick but ignored half-brother.

Report the results of the investigation around the household in search of cases

On September 30, 2015, we conducted a mission in the town of Koumra to the home of the girl's family. The team consisted of the district human African trypanosomiasis focal point nurse, the nurse in charge of the Bodo Catholic health center and myself as the Bodo district chief medical officer.

After explaining the purpose of the mission and obtaining the informed consent of the family and neighbors, a targeted interrogation of the family and their entourage in search of risk factors for contamination allowed us to collect the following information. All had affirmed that the girl had never left the environment since her birth. Regarding the knowledge about the disease, the neighbors affirmed that they had clear knowledge about the disease only during the illness of the half-brother and the girl. For the father, he was informed of the existence of sleeping sickness and said that he had a better understanding of the clinical signs than when his son was hospitalized. This is what motivated him to go with his daughter to the Catholic Health Center of Bodo. Upon inspection, we did not observe any suspicious signs of the disease in the family or in the surroundings. The girl recovered her health without any sequelae. Subsequently, a rapid diagnostic test for human African trypanosomiasis was performed on family members and neighbors, but all results were negative. This confirms that the environment does not have all the elements of the epidemiological cycle. As a preventive measure against infections (malaria, human African trypanosomiasis, ...), mosquito nets were distributed to the family and neighbors.

IV. CONCLUSION

Human African trypanosomiasis is an endemic disease, classified as a neglected tropical disease that the world plans to eliminate as a public health problem by 2020. The contamination occurs in the villages at risk of the outbreaks, but this case had taken place outside on a person who had never stayed in the risk area. This means that even outside the risk zone, people can be infected. We suggest that the screening test for human African trypanosomiasis be made mandatory for all blood transfusions, at least in countries endemic for human African trypanosomiasis.

ACKNOWLEDGEMENTS

We wish to thank

Ministère de la Santé Publique et de la Solidarité Nationale du Tchad à travers le Programme National de Lutte contre la Trypanosomiase Humaine Africaine (PNLTHA) et le District Sanitaire de Bodo.

CIESPAC (Centre Inter-Etat de Spécialisation en Santé Publique d'Afrique Centrale) et tous les encadreurs et corps enseignants chercheurs.

A mon maitre Dr GHOMA LINGUISSI Laure Stella

Footnotes

Authors' contributions

All the authors participated in the discussion of the one case and contributed to the drafting of the manuscript. All authors read and approved the final manuscript.

Competing interests: The authors declare that they have no competing interests.

Patient consent : Obtained.

Provenance and peer review: Not commissioned; externally peer reviewed.

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