Scientific Research Publishing

Open Journal of Pediatrics, 2023, 13, 613-618
https://www.scirp.org/journal/ojped
ISSN Online: 2160-8776
ISSN Print: 2160-8741

Multifocal Tuberculosis Revealed by Facial Paralysis

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How to cite this paper: Talboussouma, S.M., Tchagbele, O.-B., Agba, L., Segbedji, K.A.R., Boume, M.A., Gbadoe, D.A. and Azoumah, K.D. (2023) Multifocal Tuberculosis Revealed by Facial Paralysis. *Open Journal of Pediatrics*, **13**, 613-618.
https://doi.org/10.4236/ojped.2023.135068

Received: August 1, 2023
Accepted: September 2, 2023
Published: September 5, 2023

Abstract

Introduction: Tuberculosis is a chronic infectious disease that remains a global public health problem. Children, accounting for 10% of cases, are particularly vulnerable to this disease. Based on a case of multifocal tuberculosis in a 14-month-old infant, the authors conducted a literature review on this condition. **Observation:** The case involved a 14-month-old infant referred from a health center for persistent symptoms including anemia, fever, and lateral deviation of the mouth during crying. Clinical examination revealed an infectious and meningeal syndrome, as well as facial paralysis. The results of brain imaging, cerebrospinal fluid examination, fundus examination, and gastric lavage fluid examination led to the conclusion of multifocal tuberculosis in the infant without association with HIV. Improvement was observed one week after the start of antituberculosis treatment, with complete recovery without sequelae after 12 months. **Conclusion:** Although rare, multifocal tuberculosis does exists and its diagnosis remains challenging in infants. Early treatment generally leads to favorable outcomes, especially in the absence of HIV coinfection.

Keywords

Multifocal Tuberculosis, Choroidal Tubercles, Child, Cerebral Tuberculosis, Togo

1. Introduction

Tuberculosis (TB) is a chronic granulomatous infection caused by Mycobacte-

rium tuberculosis or bovis, which can affect any organ. It remains a public health problem in our context. The World Health Organization (WHO) estimated that in 2016, there were 10.4 million new cases of tuberculosis. During the same year, the disease was responsible of the death of 1.3 million people without HIV infection and 374,000 people with HIV infection. Children are particularly vulnerable to this disease, accounting for 10% of pediatric cases [1]. In 2015, it was estimated that there were 1 million new cases of childhood tuberculosis and 210,000 deaths due to tuberculosis in children [1]. While pulmonary involvement remains the main manifestation, cases of extrapulmonary and even multifocal tuberculosis can be observed. Multifocal tuberculosis (TBM) is defined as the involvement of at least two extrapulmonary sites, with or without pulmonary involvement [2]. Multifocal forms are rare and represent 9% to 10% of extrapulmonary cases. They occur more often in immunocompromised patients, particularly those infected with the human immunodeficiency virus (HIV). Their prognosis is poor, with a mortality rate of 16% to 25% according to various authors [3]. Multifocal forms have been the subject of few publications, especially in children [2] [4] [5] [6]. To our knowledge and based on a literature review, no case of TBM has been reported in Togo to date. In this study, we report a case of TBM in a 14-month-old infant, followed by a literature review on the subject.

2. Observation

It concerned a 14-month-old female infant who was referred from a local health center due to anemia, fever, and lateral deviation of the mouth during crying. This otherwise healthy child had presented with unexplained, incessant crying, occasional dry cough, and early postprandial or sometimes late vomiting three weeks prior. She had a persistent hyperthermia, more pronounced in the evenings and resistant to usual analgesics. The mother reported unspecified weight loss. There was no diarrhea or convulsions. Despite multiple consultations at various health centers, no improvement was observed. The occurrence of facial asymmetry during crying prompted a referral to CHU Kara for better management. During the interview, it was noted that the infant and her parents had been in contact with an uncle who had stayed in the same location for three months and had tuberculosis. The child was delivered vaginally and received all recommended vaccinations, including the Bacillus Calmette-Guérin (BCG) vaccine administered at birth. On examination, the child weighed 8 kg and measured 76 cm in height. Interpretation of these anthropometric parameters indicated a risk of underweight and acute malnutrition. There was evidence of an infectious syndrome, right upper limb paresis with abolished ipsilateral osteotendinous reflex (OTR), and a positive Babinski sign on the right side. Ptosis of the left eye was noted. Right facial paralysis (PF) was confirmed by leftward lateral deviation of the labial commissure and obliteration of the right nasolabial fold, which were more evident during crying. There were no objective sensory disturbances. Neck stiffness was present along with a positive Brudzinski sign.

Based on this clinical examination, the combination of an infectious syndrome, meningeal syndrome, right pyramidal syndrome with involvement of the left oculomotor nerve resulting in Weber's syndrome suggested an intracranial expansive infectious process localized in the brainstem with associated meningeal involvement. Brain imaging was requested to further specify the diagnosis. The contrast-enhanced brain CT scan revealed a target-shaped lesion in the left cerebellar hemisphere with perilesional edema exerting a mass effect on the pons (Figure 1).

There were no abnormalities in the supratentorial region or brainstem that could explain the focal deficits in the limbs and face. The HIV serology was negative. The complete blood picture showed a moderate lymphopenia at 2600 cells/μL (normal: 3000 - 13,500 cells/μL). The C-reactive protein (CRP) level was 67.15 mg/L (normal < 10 mg/L). Liver and kidney function tests were normal. There were no electrolyte imbalances. Lumbar puncture followed by analysis of cerebrospinal fluid (CSF) revealed elevated protein levels at 1.0 g/L (normal < 0.5 g/L) and low glucose levels at 0.23 g/L (normal > 0.5 g/L). The search for Mycobacterium tuberculosis (MTB) using polymerase chain reaction (PCR) technique was positive in the CSF. PCR performed on gastric wash fluid was also positive. Chest X-ray revealed disseminated tuberculosis (miliary TB) (Figure 2). Fundoscopy (FO) examination revealed choroidal tubercles known as Bouchut's nodules. Based on these additional tests, the diagnosis of tuberculous meningitis (TBM) was confirmed in an immunocompetent 14-month-old infant. In terms of treatment, the child was started on a four-drug antituberculous regimen consisting of Isoniazid (H), Rifampicin (R), and Pyrazinamide (Z) for the initial two months, followed by a two-drug regimen (RH) for an additional ten months. Corticosteroid therapy was initiated at the beginning of treatment with intravenous methylprednisolone at a dose of 1 mg/kg/day for five days. Improvement in signs and symptoms was noted one week after starting treatment. At two months of treatment, the physical examination was normal, and the search for MTB in gastric wash fluid was negative. After completing 12 months of treatment, the child was cured without any sequelae.

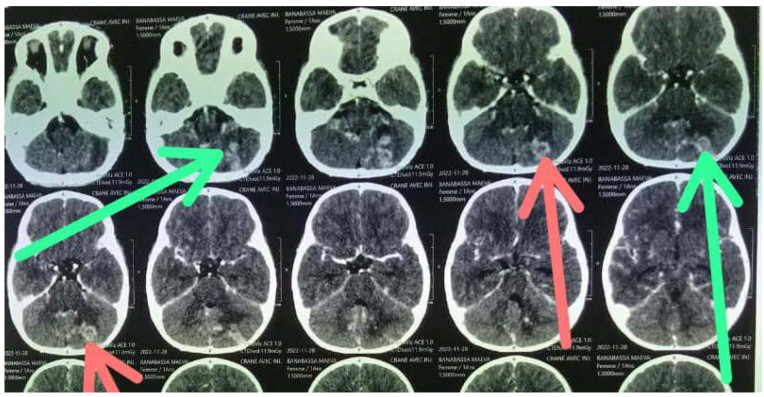

Figure 1. Brain CT scan with contrast highlighting a target-shaped image in the left cerebellar hemisphere, with perilesional edema exerting a mass effect on the brainstem.

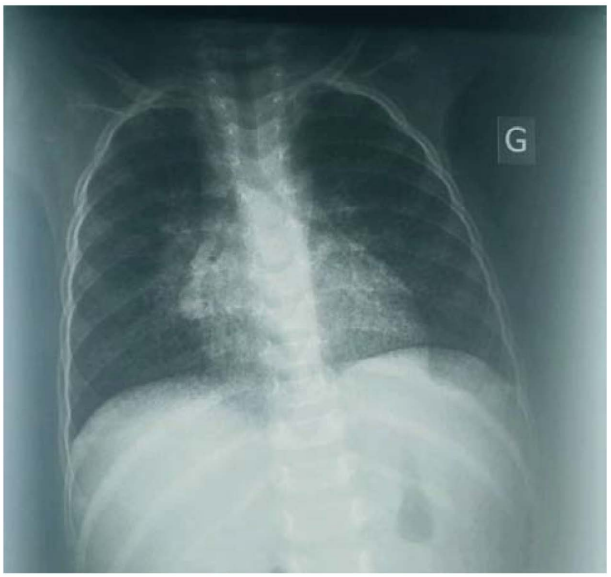

Figure 2. The PCR technique performed on the gastric lavage fluid was also positive. Chest X-ray revealed miliary tuberculosis.

3. Discussion

Tuberculosis (TB) is a condition that is asymptomatic in the majority of affected individuals. The risk of progression from asymptomatic TB to active TB disease is low (5% - 10% over a lifetime) in immunocompetent individuals [7]. Specifically, in infants aged 12 to 24 months, the risk of developing active TB disease in immunocompetent patients is 10% - 20% for pulmonary TB and 2.5% for miliary TB or TB of the central nervous system (CNS) according to Marais [7]. As TB is an infectious disease, the concept of contact is crucial in the investigation of the affected individual. In our patient, the time spent together with the asymptomatic uncle serves as the main risk factor for this contact. Literature reports that children are highly susceptible, and even a brief exposure of 15 to 20 minutes can be enough to transmit the TB germ to them [1]. The clinical manifestations of tuberculosis are numerous and varied. Depending on the affected organ, the signs will vary. The most commonly affected extrapulmonary organs include the lymphatic system, kidneys, bones, and meninges. In extreme cases, miliary TB can occur, which results from hematogenous dissemination to multiple organs and increases the risk of meningitis [8] [9]. In our patient, the involvement of the central nervous system led to the diagnosis, with the presence of BK bacteria identified in the cerebrospinal fluid (CSF). Further investigations revealed the presence of TB in other sites, including the eyes and lungs. This condition involving multiple sites is known as multifocal tuberculosis [2]. The World Health Organization (WHO) emphasizes the following diagnostic criteria for tuberculosis in children: a thorough interview including information on contact and symptoms, tuberculin skin test results, pulmonary radiography findings (when available), possible bacteriological confirmation, specific examinations depending on the location of extrapulmonary TB, and HIV testing [10].

The current clinical case followed these steps, which certainly led to the identification of all the sites affected in the infant and confirmed that he was not infected with HIV through a negative retroviral serological test. In its multifocal form, tuberculosis represents a therapeutic emergency, especially in infants who have a fragile condition. The patient's treatment consisted of the use of three antituberculous drugs: a combination of RHZ for two months, followed by a two-drug combination of RH for an additional 10 months. The treatment of tuberculosis in children is similar to that in adults, with a few exceptions. According to Recommendation 9 of the WHO National Tuberculosis Treatment Guidelines [11], ethambutol is not included in the standard protocol for children. This justified the use of the RHZ regimen during the intensive phase, followed by the RH combination. Corticosteroid therapy plays a vital role in the initial management of tuberculous meningitis, especially in HIV-negative children [12]. This was the reason for prescribing prednisone for our patient for a duration of 5 days. The duration of treatment chosen for our patient is 12 months, following the recommendations of the WHO and the national tuberculosis control program in effect in Togo [11]. According to these recommendations, extrapulmonary tuberculosis requires a treatment duration of 12 months in immunocompetent individuals, which can be extended to 2 years in cases of HIV co-infection, as described by Roos [13]. The prognosis is generally favorable once treatment is initiated early [5] [14] [15]. This was the case with the reported patient, in whom general symptoms completely regressed within one week, and at 2 months, the neurological examination was also normal. The majority of deaths occur in cases of HIV co-infection [16].

4. Conclusion

Tuberculous meningitis (TBM) is a rare presentation of tuberculosis and represents a significant diagnostic challenge, especially in infants who are a vulnerable population. The diagnostic delay is even greater in the absence of HIV co-infection. However, once the diagnosis is established, TBM treatment generally leads to a favorable prognosis due to the effectiveness of anti-tuberculous drugs. The concept of tuberculosis contact should be a central element in the diagnostic process for this age group, where the interrogation relies mainly on information provided by parents. This concept of tuberculosis contact should be systematically taught to parents in areas where tuberculosis remains endemic, in order to provide primary prevention for children who are often vulnerable.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Carvalho, A.C.C., Cardoso, C.A.A., Martire, T.M., Migliori, G.B. and Sant'Anna, C.C. (2018) Epidemiological Aspects, Clinical Manifestations, and Prevention of Pediatric Tuberculosis from the Perspective of the End TB Strategy. *Jornal Brasilei-*

ro de Pneumologia, **44**, 134-144. https://doi.org/10.1590/s1806-37562017000000461

[2] Desnos, L., Kom-Tchameni, R., Razafindrakoto, H., Fryder, I., Janoyer, M. and Elenga, N. (2017) Tuberculose multifocale révélée par un mal de Pott chez une enfant guyanaise de 11 ans. *Bulletin de la Société de Pathologie Exotique*, **110**, 234-237. https://doi.org/10.1007/s13149-017-0570-1

[3] Denis-Delpierre, N., Merrien, D., Billaud, E., Besnier, J.M., Duhamel, E., Hutin, P., *et al.* (1998) Tuberculose multifocale: À propos de 49 cas. *Pathologie Biologie*, **46**, 375-379.

[4] Al-Otaibi, A., Almuneef, M. and Hameed, T. (2012) An Unusual Combination of Extrapulmonary Manifestations of Tuberculosis in a Child. *Journal of Infection and Public Health*, **5**, 203-206. https://doi.org/10.1016/j.jiph.2011.11.005

[5] Mabiala-Babela, J.R., Makosso, E. and Senga, P. (2008) Etude retrospective de 61 cas de tuberculose multifocale chez l'enfant a Brazzaville, Congo. *Médecine Tropicale*, **68**, 41-44.

[6] Tinsa, F., Essaddam, L., Fitouri, Z., Nouira, F., Douira, W. and Becher, S.B. (2009) Extra-Pulmonary Tuberculosis in Children: A Study of 41 Cases. *Tunisie Medicale*, **87**, 693-698.

[7] Marais, B.J., Gie, R.P., Schaaf, H.S., Beyers, N., Donald, P.R., Starke, J.R., *et al.* (2006) Childhood Pulmonary Tuberculosis: Old Wisdom and New Challenges. *American Journal of Respiratory and Critical Care Medicine*, **173**, 1078-1090. https://doi.org/10.1164/rccm.200511-1809SO

[8] Cruz, A.T. and Starke, J.R. (2007) Clinical Manifestations of Tuberculosis in Children. *Paediatric Respiratory Reviews*, **8**, 107-117. https://doi.org/10.1016/j.prrv.2007.04.008

[9] Sant'Anna, C.C. (2012) Diagnóstico da tuberculose na infância e na adolescência. *Publicações Revista Pulmão RJ*, **21**, 60-64.

[10] World Health Organization (2014) Guidance for National Tuberculosis Programmes on the Management of Tuberculosis in Children. 2nd Edition, World Health Organization, Geneva. http://www.ncbi.nlm.nih.gov/books/NBK214448/

[11] World Health Organization (2014) Treatment of TB in children. In: *Guidance for National Tuberculosis Programmes on the Management of Tuberculosis in Children*, 2nd Edition, World Health Organization, Geneva. https://www.ncbi.nlm.nih.gov/books/NBK214449/

[12] Prasad, K., Singh, M.B. and Ryan, H. (2016) Corticosteroids for Managing Tuberculous Meningitis. *Cochrane Database of Systematic Reviews*, No. 4, Article No. CD002244. https://doi.org/10.1002/14651858.CD002244.pub4

[13] Archibald, L.K. and Quisling, R.G. (2013) Central Nervous System Infections. *Textbook of Neurointensive Care*, **7**, 427-517. https://doi.org/10.1007/978-1-4471-5226-2_22

[14] Anane, R. (2003) La tuberculose de l'enfant en Afrique: Aspects épidémiologiques, cliniques et thérapeutiques. *Médecine Tropicale*, **63**, 473-480.

[15] Aubry, P., Kamanfu, G., Mlika-Cabanne, N., Nikoyagize, E., Fagard, C., Niyongabo, T., *et al.* (1994) La tuberculose á l'heure du SIDA en Afrique Sud-Saharienne. Experience d'un pays d'Afrique centrale: Le Burundi. *Médecine Tropicale*, **54**, 67-74.

[16] Kakou, A., Eholie, S., Yao, B., Coulibaly, M., Ehui, E., Bissagnéné, E., *et al.* (1999) Problèmes engendrés par l'utilisation des antituberculeux dans un service de référence pour VIH/SIDA à Abidjan (Côte d'Ivoire). *Bulletin de la Société de Pathologie Exotique*, **92**, 42-45.