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Tuberculosis Meningitis–How Early Can it Occur?

S. Thora
S.D. Singh
B.C. Chhaparwal

Tuberculous meningitis (TBM) is fairly common and a dreadful complication of primary complex in pre-school children in our country. Early onset of the disease indicates high prevalence of pulmonary tuberculosis in the community and carries a high mortality and morbidity(1). Early onset could either be because of congenital or post-natally acquired infection.

It takes about 6-8 weeks for a primary complex to develop(1). It is after 6-12 months of primary infection that the tuberculous meningitis, secondary to hematogenous spread, occurs. The commonest age group for tuberculous meningitis is 9 months to 3 years(2-6). Tuberculous meningitis (TBM) is very rare before 4 months of age. TBM is a very sensitive index of prevalence of pulmonary tuberculosis in the community(1). When tuberculosis starts declining, the decline is first seen in younger age group and in respect of those manifestations which are seen secondary to hematogenous spread(2). Recently, we came across a case who had tuberculous meningitis who became symptomatic at 3½ months of age. We feel it is the earliest age at which post-natally acquired TBM can manifest.

Case Report

A four-month-old infant was brought to the Chacha Nehru Bal Chikitsalaya Avam Anusandhan Kendra, Indore with the complaints of cough, cold, breathlessness, off feeds, dullness and loose motions since 15 days. He was born full term and was delivered normally at home. The birth weight was not known and perinatal history was uneventful. He had one brother 1½ year old who was healthy. The parents belonged to low socio-economic status and were laborers. The infant was mainly breast fed and was unimmunized. There was no history of contact with tuberculosis in the family. Before this illness, the development of baby was normal.

From the MGM Medical College, MY Hospital and Chacha Nehru Bal Chikitsalaya Awam Anusandhan Kendra, Indore

Received for publication May 7, 1990; Accepted December 10, 1990

On examination at admission, weight was 4 kg, length 55 cm, head circumference 38.5 cm, heart rate 140/min and respiratory rate 66/min. Baby had Grade-II malnutrition. He was dull, pale and toxic, anterior fontenalle full but pulsatile, had neck retraction and moderate dehydration. He had shrill cry, alae nasi were working and there was intercostal and subcostal recession with bilateral coarse crepitations. Abdomen was protruberant with liver 4 cm, firm nontender with smooth surface, spleen was 3 cm enlarged in axis and firm. There was no free-fluid in the abdomen. Examination of CNS showed grade I coma, neck rigidity, hypertonia, hyper-reflexia and absent Moro's reflex. A provisional diagnosis of bronchopneumonia with meningitis was made.

Investigations revealed a hemoglobin of 7g/dl, total leucocyte count of 14,500/cu mm (p83, L12, M1, E4), polymorphs showed toxic granules and erythrocyte sedimentation rate was 36 mm at the end of first hour. Lumbar puncture revealed clear CSF with raised pressure and cobweb formation. Pandy's test was positive, proteins 75 mg/dl, sugar 40 mg/dl and cells 38/cu mm, predominantly polymorphs. Cobweb on Ziehl Neelsen staining showed acid fast bacilli (AFB). CSF culture after 6 weeks was positive for AFB, *X*-ray chest showed bilateral miliary mottling with right paratracheal glands. *X*-ray abdomen showed soft tissue shadow of both enlarged liver and spleen.

Ziehl Neelsen staining from gastric aspirate did not reveal any organisms and culture for AFB was sent. With these reports, the child was diagnosed as having miliary tuberculosis with meningeal involvement. Treatment started was oxygen, intravenous dextrose 10%, blood transfusion, streptomycin, isonicotinic acid, rifampicin, and pyrazinamide with steroids. On the second day, BCG vaccine was given which did not reveal any reaction after 48 hours. On the third day, an ophthalmic consultant reported a few pale areas with indefinite edges along the branches of central retinal artery at the periphery of fundus suggestive of choroid tubercles. On the same day transfontanellar cerebral sonography was done which revealed moderate dilatation of ventricles with a block at the level of aqueduct. There was no granulomata and the brain matter was normal. Liver biopsy revealed focal areas of caseation and necrosis scattered throughout the parenchyma with mononuclear cells infiltration. There was no classical granulomata in the liver. His gastric lavage did not show growth of AFB, but CSF yielded a pure growth of mycobacterium tuberculosis on Loewenstein Jensen's media.

The child was in the hospital for 15 days, during which he showed remarkable recovery. On fourth day, his respiratory distress settled, the baby resumed breast feeding and subsequently looked interested in surroundings. His liver and spleen regressed in size and were soft. Repeat CSF on the 10th day was normal. At the same time both parents and their 1½ year old child were investigated for tuberculosis. Mantoux test was positive (more than 10 mm) in all three and *X*-rays chest were within normal limits. On 15th day, the child was discharged on antitubercular treatment and was asked to attend follow-up clinic.

Discussion

This child had miliary tuberculosis with meningeal involvement and the lesion was proved bacteriologically and histologically.

Since mother had no evidence of active tuberculosis and infant did not manifest during neonatal period, it seems unlikely that infection occurred antenatally(7,8). This baby must have got infection postnatally either through some visitor in the house or outside when parents were going for work. This must have given rise to primary complex as *X*-ray chest showed right paratracheal gland, complicated with early hematogenous spread. In this child it is difficult to explain this early hematogenous spread. Known predisposing factors are malnutrition, measles, whooping cough, streptococcal infection and immune deficiency status, *etc.*(2). Lincon *et al.*(9) mentioned that TBM is a rarity before 4 months of age. Occurrence of an early tuberculous meningitis through miliary spread reflects a high prevalence of infective adult pulmonary tuberculosis in the community. An early occurrence of hematogenous spread also emphasizes the need for giving BCG vaccine soon after birth, as it is claimed to prevent hematogenous spread(10,11). In a tropical country like our's with high prevalence of infective pulmonary tuberculosis, a high index of suspicion for early diagnosis is important to prevent mortality and morbidity in infants.

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