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Primary Multi Drug Resistant Tuberculosis in a Well Grown Immuno-Competent Infant: A Rare Case Report

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Abstract: ***Tuberculosis is a one of the leading causes of morbidity and mortality globally. Rise of MDR-TB cases even in pediatric age group, has worsened the scenario. Cases of MDR-TB have been reported in infant in a contact with an adult MDR-TB case, here we report a case of well grown 4-months old immuno-competent baby with MDR-TB without a known contact history or congenital TB. Patient presented with respiratory distress and poor sensorium and was eventually diagnosed with MDR-TB and was started on second-line of anti-tubercular drug regimen.***

Keywords: MDR-Tuberculosis, Well-grown infant, immunocompetent, no contact history, respiratory distress, second-line AKT

1. Introduction

Tuberculosis is an infectious disease caused by *Mycobaterium tuberculosis*, which is among the leading causes of death globally. In 2018, 1.1 million children fell ill with tuberculosis globally and there were 205,000 deaths of children due to tuberculosis.[1] Even though pediatric tuberculosis is not uncommon, it still goes missed or undiagnosed due to its paucibacillary nature and difficulty in diagnostic methods for children. Moreover, multi-drug-resistant tuberculosis (MDR-TB) has emerged as a greater threat to public health. As with tuberculosis, MDR-TB also affects the pediatricpopulation yet the cases diagnosed are less as compared to adult MDR-TB. There are hardly any cases reported in literature where infant was affected by MDR-TB with no tuberculosis in mother.

2. Case Summary

We report a case of 4-month-old female previously healthy child born of non-consanguineous marriage who presented with complaints of fever, cough, rapid breathing and lethargy for 4 days.Onpresentation, her vitals were deranged, heart rate was 180/min, respiratory rate was 78/min. There were severe chest retractions and on chest auscultation air entry was decreased bilaterally. No hepatosplenomegaly was present. Baby was lethargic and responded poorly to stimulus. As the baby had features of shock, she was admitted in PICU.She was previously exclusively breast fed and gaining weight. Mother had no illness during and after the delivery and there was no evident history of any exposure of the baby to a case of tuberculosis. Birth history and past history were insignificant.CBC showed hemoglobin of 7.1g/dL, platelets 69,000 and a highly positive CRP. Chest X-ray showed mild bilateral pleural effusion, 2-D echo ruled out any cardiac involvement. In the PICU, baby was electively intubated and higher anti-biotics were instituted. After initial improvements there was continuous fever andrespiratory distress. Repeat chest X-ray and USG were suggestive of severe pleural effusion (left > right).Intercostal drainage revealed empyematous fluid which was sent for investigation. GeneXpert reportedMDR-TB and ADA was 45 IU/L. A family screening was done which was negative for tuberculosis. Second line AKTdrugs (injection Amickacin, tab. Moxifloxacin, tab. Monopas, cap. Clofazimine, syp. Linezolid) and syrup Prednisolone were started after consulting a pediatric tuberculosis specialist. Patient's condition improveddrastically on starting AKT and was discharged. She has been following-up and the baby is healthy.

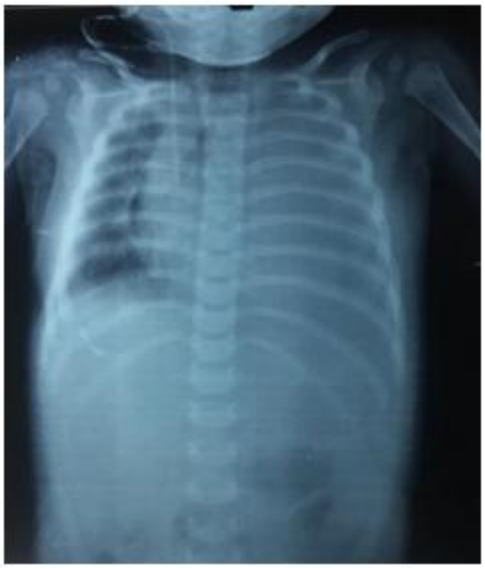

Figure 1: X-ray chest of the baby with MDR-TB showing bilateral pleural effusion

3. Discussion

WHO in 1993 declared tuberculosis (TB) as a global emergency because of the rising prevalence of drug resistant strains. Many studies have suggested that MDR-TB strains are as infectious as the drug susceptible strains.[2,3] Drug resistance is classified into primary and secondary resistance. Primary resistant cases are those where there is

initial exposure and infection with resistant organism. Development of resistance to anti-tubercular therapy due to causes like non-compliance, inadequate therapy, malabsorption and interaction between the drugs, is known as secondary or acquired resistance.[4] In young children usually primary resistance is seen, which was also present in our case. As patient tested positive for MDR-TB before the commencement of regimen, our patient was diagnosed with primary MDR-TB. Review of literature does not show any case where the child was less than 6 months with primary MDR-TB and without any known contact with a case of MDR-TB. Cases with congenital TB have been reported, to distinguish between congenital and postnatal MDR-TB , Cantwell's criteria[5] is used. In our case the baby did not fulfil thiscriteria, hence was a postnatally acquired MDR-TB, the baby was well-grown and previously well. Table-1 shows the burden of MDR-TB in the various pediatric age group.MDR-TB is associated with HIVand can lead to pneumonia. In our case both mother and baby were immune-competent.As per WHO, children should be suspected to have DR-TB if they are in contact with a known case of DR-TB or show no response to the standard anti-tubercular regimen or there is recurrence of TB after complete treatment. There was no contact found in the family on screening which is not congruent with this criterion of WHO, though GeneXpert was positive for MDR-TB strains in the pus samples of the baby.Tuberculosis in children mirror the cases that have recently acquired the tuberculosis infection, they aid as an indicator of the drug-susceptibility patterns and circulating strains in a community.[6] In our patient we found that there was resistance to Rifampicin and Isoniazid which was important to devise the treatment plan. After diagnosis of MDR-TB in children, second line anti-tubercular regimen is started and are planned as per the drug sensitivity. Though the response of treatment of children with MDR-TB is better than adults with MDR-TB, yet the child be referred to a specialist since children show a variation in absorption of drugs,metabolism of drugs, distribution in tissues and response to drugs and adverse drug reactions.

Table 1

Estimated incident pediatric MDR-TB cases, and the estimated number of children with MDR-TB who could be found through household contact investigations of adults starting MDR-TB treatment, by region. UI=Uncertainty Interval; CI=Confidence Interval[7]

Region*	Estimated incident pediatric MDR-TB cases based on 2010 data (95% CI)†	Children <5 years old with MDR-TB in households of adult MDR-TB patients in 2015 (95% UI)	Children 5-14 years old with MDR-TB in households of adult MDR-TB patients in 2015 (95% UI)
Africa	4,736 (2,829 – 6,848)	1,035 (510 – 2,063)	1,909 (629 – 5,694)
Americas	606 (374 – 854)	150 (75 – 300)	285 (96 – 857)
Eastern Mediterranean	2,417 (339 – 5,087)	281 (140 – 567)	452 (151 – 1,346)
European	5,645 (4,206 – 7,463)	832 (394 – 1,634)	1,562 (557 – 4,388)
South-East Asia	10,000 (4,993 – 15,568)	1,593 (781 – 3,212)	2,970 (1,005 – 9,113)
Western Pacific	8,349 (5,639 – 11,610)	447 (219 – 903)	889 (296 – 2,667)
Global	31,948 (25,594 – 38,663)	4,350 (2,137 – 8,708)	8,082 (2,727 – 24,060)

4. Conclusion

Tuberculosis should be always consideredin the differential diagnosis of a sick child of any age, even less than one year of age, in places with high prevalence of tuberculosis. Tuberculosis cannot be simply ruled out in the absence of identification of the contact case. MDR-TB can be present in any age group and does not limit to immune-compromised children. Hence work-up to rule out tuberculosis should be done in sick children, even in previously healthy and well grown infants in regions where tuberculosis is common. Treatment with second-line anti-tubercular drugs show rapid improvement in MDR-TB of children, thus any child with MDR-TB should be referred to a specialist for further management.

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