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Case Report

Repeated false positive HIV DNA PCR in an exposed infant

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A male neonate was delivered at term on 24/8/09 at our hospital by elective LSCS to an HIV positive mother (whose husband was also HIV positive). Mother had been given ART in pregnancy starting from 14th week (AZT, 3TC and NVP). CD4 counts were 540/cumm at the time of starting ART and she had an uneventful pregnancy. Baby had a birth weight of 2.7 kg and cried immediately. He was given single dose of NVP 2 mg/kg at birth followed by AZT daily @ 8 mg/kg/day in 4 divided doses for 6 weeks. Breast milk was omitted and he was put on formula feeds after assuring availability, feasibility, sustainability and safety. At 10 weeks of age he weighed 4.7 kg and was asymptomatic. DNA PCR (done from a private NABL certified laboratory) was positive for HIV1 (negative for HIV2). The test was repeated from the same laboratory 4 weeks later on a fresh sample and was again positive for HIV 1 (negative for HIV2). CD4 counts done at 4 months of age were 740/cumm (32%). He was started on ART (AZT, 3TC and NVP) along with TMP prophylaxis as per the then prevalent NACO guidelines for therapy which was given regularly for the next 1 year. He received immunizations as per IAP schedule. At 11 months he developed an episode of severe lobar pneumonia requiring hospitalization for 2 weeks and treatment with broad-spectrum antibiotics, IV fluids and oxygen. Thereafter he had multiple episodes of virus induced wheeze which responded to inhaled bronchodilators. He showed adequate weight gain with normal development. At 16 months his CD4 count was 780/cumm (33%) and all drugs were stopped. ELISA testing done at 18 months was negative. This was repeated three

Introduction

Diagnosis of HIV positivity in infancy is fraught with problems not least among which is false positivity of the so-called diagnostic tests. This may result in unnecessary treatment of the infant. We report a case in which the DNA PCR test was twice positive in infancy only to become negative later. Authenticity of the tests and history was confirmed from original reports and hospital records of the patient.

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times in the next 2 years along with DNA PCR from the same laboratory at 3 years all of which were all negative. At 3.5 years viral load testing (Cobas Ampliprep/Cobas Taqman) was below detectable limits of the test (<20 copies/ml). Presently he is asymptomatic and weighs 12 kg at 3.5 years. Parents have been told that the child is HIV negative.

Discussion

Reversal of true HIV positive status to negative in infants born to positive mothers has not been reported in children except for a single case report at a recent conference at Atlanta which incited a lot of media publicity.¹ The initial diagnosis of perinatally transmitted HIV is based on the DNA PCR test. However false positivity is well known and hence a repeat test immediately or as soon as possible on a fresh sample is recommended. Our infant tested positive twice with DNA PCR – at 10 weeks and 14 weeks of age – before we ‘labeled’ him as HIV +ve for the purpose of further management. He was started on treatment, which was in accordance with the NACO and WHO guidelines prevalent at that time.² We did not do RNA PCR or viral load before starting the ART because of the cost involved, the normal CD4 counts and the protocols followed in the hospital. Also it is well known that if the infant has already been exposed to antiretroviral drugs before or at the time of the test, an undetectable viral load with a low sensitivity qualitative test cannot be taken to exclude HIV. We were surprised when the ELISA test was negative at 18 months. Single false positive DNA PCR in infants is well known. In a study from South Africa it was shown that in situations where perinatal transmission is <3% this could be as high as 16%.³ In this retrospective study on 718 HIV positive children, 40 babies with initial positive DNA PCR later tested negative on antibody tests. Aggarwal et al reported 3 cases of false positive DNA PCR testing in infancy with negative ELISA at 15–18 months of age.⁴ A report by Shah from Mumbai showed that of 36 infants born to HIV positive mothers who were tested by HIV DNA PCR test, 15 patients (41.8%) had a positive test and 21 patients (58.2%) had a negative test. 12 of the positive patients (80%) had a false positive test as shown by the repeat DNA PCR test which was negative. None had a false negative test, making the sensitivity of HIV DNA PCR test 100% and specificity 53.9%. The same study showed that RNA PCR was much more sensitive and specific for the diagnosis of perinatally transmitted HIV than DNA PCR.⁵ This has been confirmed by other studies as well.⁶ The latest 2010 WHO guidelines recommend that the preferred confirmatory test in infants with a positive DNA PCR is the RNA PCR or viral load.⁷ Bakshi et al reported three HIV1 exposed children who had repeatedly positive DNA PCR tests before testing negative. All had a transient drop in CD4:CD8 ratio to <1.0 before seroconversion. The authors postulate that the transiently positive

DNA PCR was either due to the HIV infection being eliminated or being caused by an attenuated strain of virus.⁸ No other published reports could be traced where repeated DNA PCRs were falsely positive, though logically, the possibility remains. We would like to think that the ART given to our baby resulted in ‘elimination’ of the attenuated virus but this is debatable as the CD4 counts were always normal, the baby did not have any AIDS defining illness and he did not generate an antibody response to the virus. According to the latest WHO document, at an HIV prevalence rate of 2% in an infant population (i.e. a good coverage of PMTCT interventions), 294 positive infants will be identified for every 10,000 virological tests performed, of whom 196 will be actually infected, i.e. only two out of three infants who initially test positive are actually infected. In one out of three infants the confirmatory test will be negative. However, they do not comment on repeated false positive DNA tests. This case report is being submitted to stimulate discussion and sharing of similar experiences.

Conflicts of interest

All authors have none to declare.

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