False-positive HIV DNA PCR testing of infants

To the Editor: I would like to share ideas on the report by Feucht *et al*. who concluded that 'Decreasing mother-to-child HIV transmission rates reduce the positive predictive value of a single HIV DNA PCR test result, necessitating adaptations to diagnostic algorithms to avoid misdiagnosis and inappropriate treatment, especially with early initiation of antiretroviral therapy in asymptomatic infants.'[1]

False positivity is basic in laboratory medicine and can result from any tests, including molecular diagnoses. The basic concept to consider when discussing the diagnostic property of a test is that prevalence is the main factor determining sensitivity, specificity and predictive values, which can be reflected in their report. The authors' conclusions are based on a single centre with retrospective data review, which cannot control for the confounding factors and quality of the laboratory test.

Despite the use of molecular testing for HIV diagnosis, practitioners must be concerned about the possibility of false positivity, as available commercial kits for HIV molecular testing differ in their false-positive rates.[2] The information on the false-positive rate of each diagnostic test should be available for interpretation of the results. There should also be a focus on the quality of the diagnostic test, as poor quality of some locally available in-house HIV molecular testing owing to contamination has been reported.[3]

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1. Feucht U, Forsyth B, Kruger M. False-positive HIV DNA PCR testing of infants: Implications in a changing epidemic. S Afr Med J 2012;102:149-152.
2. Maritz J, Preiser W, van Zyl GU. Establishing diagnostic cut-off criteria for the COBAS AmpliPrep/COBAS TaqMan HIV-1 Qualitative test through validation against the Amplicor DNA test v1.5 for infant diagnosis using dried blood spots. J Clin Virol 2012;53(2):106-109.
3. Monleau M, Plantier JC, Peeters M. HIV contamination of commercial PCR enzymes raises the importance of quality control of low-cost in-house genotypic HIV drug resistance tests. Antivir Ther 2010;15(1):121-126.

Feucht replies, on behalf of the authors: We thank Professor Wiwanitkit for sharing ideas on our paper and highlighting the importance of the laboratory quality control matters, including knowledge on false-positivity rates of different test kits and use of test kits of highest quality. During our study, the great majority of HIV DNA PCR tests were done using the Amplicor HIV-1 DNA test, version 1.5 (Roche Molecular Systems), while during the last year of our study the Cobas AmpliPrep/Cobas TaqMan ('CAP/CTM') HIV-1 Qual test (Roche Molecular Systems) was introduced, which is less labour-intensive and has a shorter turnaround time. The report from Maritz *et al.*[1] on the comparison between the Amplicor and the CAP/CTM tests is of concern, owing to reported lower specificity of the CAP/CTM test. As shown in our study, any decrease in test specificity would greatly decrease the positive predictive value of any one positive HIV DNA PCR test result in the context of the rapidly decreasing prevalence of HIV infection in babies on whom routine testing is done as part of prevention of mother-to-child transmission (PMTCT) programmes.

We acknowledge the concern that our study was a retrospective review from a single centre. Our intention was to study how well the HIV DNA PCR test performs in an everyday clinical setting within a large-scale HIV programme. Our conclusion was that the false positivity rates that clinicians were experiencing can be explained by the test specificity combined with the epidemiological changes of the rapidly decreasing HIV prevalence in babies undergoing routine testing as part of the PMTCT programme.

1. Maritz J, Preiser W, van Zyl GU. Establishing diagnostic cut-off criteria for the COBAS AmpliPrep/COBAS TaqMan HIV-1 Qualitative test through validation against the Amplicor DNA test v1.5 for infant diagnosis using dried blood spots. J Clin Virol 2012;53(2):106-109.