Letter to the Editor

A STRATEGY TO IMPROVE THE ML FLOW TEST FOR DETECTION OF ANTI-PHENOLIC GLYCOLIPID-1 ANTIBODIES

Phenolic glycolipid-1 (PGL-1), a unique Mycobacterium leprae component,\(^1\) is the only antigen which has been explored widely for serological studies. Recently, Oskam and colleagues have described in detail various developments and applications of PGL-1 based serology.\(^2\) In their article, they mentioned the ML flow test, which is a very simple test for detection of anti-PGL-1 IgM antibodies, and give results that are in close agreement with those of enzyme linked immunosorbent assay (ELISA).\(^3\) The sensitivity of the ML flow test has been stated to be 97.4% for multibacillary patients, whereas for paucibacillary patients it was found to be 40%. In this article, I wish to put forth a suggestion that might lead to some improvement in the performance of the ML flow test.

As reported,\(^3\) the ML flow test uses a pad of fire-fleece which contains colloidal gold-labelled anti-human IgM antibodies. The sample is applied in the sample well, to which running buffer is then added. The sample flows towards the reagent pad, where a colloidal gold-labelled anti-human IgM antibody also joins the moving buffer. Eventually, the moving buffer, along with the antibodies, encounters the antigen, NT-P-BSA (natural trisaccharide linked to bovine serum albumin via a phenyl linker), an analogue of PGL-1, as well as IgM antibody deposited (as a positive control) in the form of separate lines on the nitrocellulose paper strip. The test results are considered valid only when the control line is clearly visible. The test is scored positive when a distinct staining of the test line is observed. When no staining or faint staining (equivocal) is observed, the test is taken as negative.

PGL-1, is well known to elicit production, predominantly, of IgM type antibodies. However, IgG and IgA antibodies are also known to be induced in the host.\(^4^{-6}\) It is possible that while detecting IgM antibodies against PGL-1, these IgG and IgA types of antibodies might interfere with or inhibit the antigen–antibody (IgM) reaction. Depending upon the avidities and affinities of various antibodies, this phenomenon, in turn, could result in reduction of the intensity of reaction due to less binding of anti-PGL IgM, and thereby could affect the test results. In my view, if gold-labelled anti-human IgM, IgG and IgA antibodies were used, simultaneously, as detector antibodies instead of anti-human IgM

![Figure 1. Diagram depicting various parts of the suggested modification to the ML flow test.](image-url)
antibody alone, the intensity of staining might improve due to combinatorial binding. By adopting this approach, samples showing equivocal or no staining might become positive. Thus, some improvement in sensitivity and thereby in grading of the results could be obtained. In the suggested modified version (Figure 1), antigen can be deposited as one line, and to validate the results, IgM, IgG and IgA types of antibodies can be deposited in the forms of three separate lines. The staining of all the control lines would indicate that the test system is working.

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References