Reviewer's report

**Title:** Evaluation of the Widal tube agglutination test for the diagnosis of typhoid fever among children admitted to a rural hospital in Tanzania

**Version:** 1 **Date:** 1 April 2010

**Reviewer:** Timothy Barkham

**Reviewer's report:**

This is interesting as it is a difficult clinical problem.

**Discretionary Revisions**

1. The general preamble suggests the Widal does not have a long and well described past – it does! It would be more helpful to readers if the introduction stated this well worn past and told us why they continue to use the assay and why they wanted to do this work when many laboratories in the ‘west’ stopped using the assay many years ago. The reason is presumably because Typhoid is endemic in their area, unlike in the ‘west’ and that the Widal may be the only available / affordable assay they have access to. Most readers are unfamiliar with the difficult conditions in Tanzania so it would help to set the scene in a little more detail to help us appreciate their work.

The clinically naked presentation of this study makes it a little less interesting. This is largely old news as shown by the references quoted. However, for each new generation it may appear ‘new’, especially as many ‘western’ laboratories no longer offer the Widal test because of its known poor performance – see reference 2 in this manuscript!

2. It would make fascinating reading to understand the problems faced in this setting, which I imagine are considerable, and to understand the value placed on the results by the clinical users. I would like to know more about the utility of the assay and consequence of results in their practice. How do they actually use the test?

**Major Compulsory Revisions**

3. Is this really the population that would be tested with the Widal in real life or was this only one part of a larger study that recruited all febrile children with the stated parameters to study febrile children in general? If so then it is unrealistic and less valuable. I have the impression that all children recruited were tested with the Widal irrespective of the clinical indication. Would they really expect to test over 100 cases to detect one real positive (and 3 false positives)? The test population is described as ‘febrile children’ so I can’t help wondering whether some could be excluded on clinical grounds which would increase the PPV and reduce the NPV. In the secondary analysis the overall performance increased dramatically as subjects with blood cultures positive for pathogens other than Salmonellae were excluded, going some way towards a more targeted testing
algorithm. This may be a false group – it all depends on how the clinicians decide who to test with the Widal in real life in their practice. Do they await blood cultures before doing the Widal? I doubt it, so suspect this improved performance is probably unrealistic. The authors should clarify whether the various populations tested in the analyses are really representative of the population that the clinicians would test in real life. If not then the data is not applicable to real life. If the authors don’t know the they should at least explain this reservation about the real life applicability of the data.

4 The data suggest to me that the test is unhelpful, so if it is used then I would like to hear more about how and why. The value of a test result may be best realized by asking how the result affects the probability of the disease and its management – the clinical applicability as specified in the STARD criteria. We are told that the pre test probability is less than 1%. What is the post test probability? If it is still very low then the test should not be used. The low PPV is expected, simply because the pre test probability is <1%. Considering the low PPV, what is their next step after a positive Widal? Do they withhold therapy in cases with negative results and give therapy to all who are positive?

Discretionary Revisions

5 Considering the low sensitivity of blood cultures the apparent ‘false positive’ Widal results may have been true positives. Did they follow up these ‘false positives’? What was their final diagnosis?

Minor Essential Revisions

6 Line 30 especially in developing countries. The Widal test is widely used in Africa but little information exists about its reliability.

Comment: The Widal is old and well known to be unreliable. Perhaps you mean … “…little has been published on its performance in Africa’.

7 Line 115 Definitions and analysis. Fever was defined as stated history or presence of fever of #37.5°C.

Comment: I don’t understand ‘Fever was defined as stated history’. Does this mean that if the patient complained of fever then this was accepted as such? Please clarify.

Discretionary Revisions
Table 1

Comment The columns are not well aligned. The words ‘Children with’ could be removed from each column to make it simpler.

**Level of interest:** An article whose findings are important to those with closely related research interests
Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
'I declare that I have no competing interests'