



Mahidol-Oxford Tropical Medicine Research Unit
Faculty of Tropical Medicine, Mahidol University, 420/6 Rajvithi Road, Bangkok 10400 Thailand
☎: 662 203 6333 Fax: 662 354 9169

February 2nd 2017

Letter to the Editor: *Lancet Infectious Diseases* journal

Reference Number: doi:10.1016/S1473-3099(16)30519-9.

Title: Biomarker tests for bacterial infection –a costly wait for the holy grail

Point-of-care biomarker tests of host-response to bacterial infection could help target antibiotics in febrile and respiratory illness. Few strategies for scaling up biomarker testing, however, have entered national guidelines partly because a perfectly accurate, low cost point of care test is yet to be developed [1]. van Houten et al. validate the accuracy of an assay that relies on three host biomarkers in hospitalized children in high income settings [2]. The combined protein signature was non-significantly superior to CRP, one of its three components, with the advantage of higher specificity; this in practice translates into further potential reduction in antibiotic overuse [3, 4].

While this progress is welcome, incremental gains over available CRP tests should be evaluated alongside other considerations. First, biomarker test performance varies across the spectrum of pathogens in different countries and climates; in children and adults; and by clinical severity. CRP is by far the most studied biomarker of bacterial infection [1, 5] and most studies, albeit not all, report significant differentiation between bacterial and viral infections. Its continued extensive clinical use decades after its discovery is itself testament to its value. It will take many years before the evidence base for other host-biomarkers is nearly as well established, a potentially costly delay considering the urgent need for better targeting of antibiotics.

Second, are important lessons from the economic and behavioural challenges to effective scale up of malaria rapid tests, including stock-outs; poor acceptance of the test and compliance with negative results; and penetration of the private sector. Factors such as these will be critical determinants of successful deployment of biomarker tests that overshadow modest variation in test accuracies. Effectively integrating biomarker testing in the public and eventually private sectors will take time and effort and should be a high priority on the research agenda.

Finally, so long as antibiotics are priced similarly or less than tests to guide their use, both the public sector and private consumers will not be incentivized to use the tests. Simple lateral flow CRP tests are available at very low cost, therefore if newer tests incur considerably higher costs this is likely to be a further impediment to their adoption.

While development of superior host-response biomarkers is important, the perfect should not be the enemy of the good. If much needed progress is already attainable with well-established, albeit imperfect tests, it would be prudent to start meeting the challenges of scaling them up. Once low cost, superior tests are available these can replace CRP tests, and hopefully in an environment where biomarker testing prior to antibiotic prescribing has become the norm.

Yoel Lubell and Thomas Althaus

The Mahidol Oxford Tropical Medicine Research Unit, Bangkok, Thailand

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