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EDITORIAL

New diagnostic tools in clinical parasitology

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Traditionally, microscopy has been the major tool used for diagnosing parasitic infections. For clinicians confronted with patients suspected of having infectious diseases, the contribution of this venerable technique is often invaluable. However, it also has numerous limitations, including cumbersomeness, a considerable need for expertise, and the lack of sensitivity and reproducibility [1].

To circumvent these long-recognized pitfalls, new technologies have emerged, often driven by advances in other microbiological disciplines, such as virology and bacteriology. The most successful advance in the past two decades has been the use of nucleic acid amplification tests (NAATs), mainly PCR, which have revolutionized many aspects of the clinical care of infectious diseases. In parallel, in low-resource settings where molecular technologies remain out of financial and technical reach, the development of simple and cheap rapid diagnostic tests (RDTs), mostly based on immunochromatography, has substantially improved the field management of important conditions such as human immunodeficiency virus infection and malaria [2]. More recently, proteomic approaches have emerged, mainly using mass spectrometry platforms, to identify biomarkers reflecting the complex host–pathogen interactions, in order to better distinguish infection and disease, or active and cured infection [1].

Incorporation of these new methods, and in particular the NAATs, in clinical practice seems to be slower in the field of parasitology than in other disciplines. Although they were often found to be more accurate and rapid than conventional microscopy, NAATs used for detecting protozoan and helminths face specific technical issues (e.g. regarding DNA extraction in stools), lack standardization, and are difficult to adequately evaluate, both in high-income settings, where numbers of infected patients are low, and in tropical areas, where this technology is demanding. There are, however, notable exceptions, such as malaria and leishmaniasis, where species-specific diagnosis by PCR has progressively become the cornerstone of clinical management in travel medicine [3]. Also, important efforts are being made to make molecular technology applicable to the most peripheral tropical areas [4], in parallel with the further development of RDTs for additional parasitic diseases [5] and challenging syndromes [6,7].

Perhaps the main reason for the slow adoption of these new diagnostic tools in clinical practice is that their added value as compared with microscopy is not yet fully appreciated. Clinicians may feel uncomfortable with new technologies that are perceived as rather expensive when the indications for their complementary or combined use with conventional methods have not been completely clarified. We therefore hope that this themed issue is timely and useful, at least for some major parasitic infections in travel and tropical settings.

In the first review [8], van Lieshout and Roestenberg share with the readers their experience in The Netherlands, where multiplex real-time PCR is progressively supplanting conventional microscopy in the first-line work-up of enteric syndromes. They propose an innovative reorganization of the tasks of routine laboratories for the diagnosis of parasitic enteritis in low-risk populations. They also discuss the clinical consequences and potential drawbacks for specific groups of patients (travellers, migrants, and immunosuppressed individuals) who might harbour a wider spectrum of parasites, and call for good collaboration between microbiologists and clinicians to maintain appropriate conventional testing whenever necessary. In the second review [9], Utzinger *et al.* consider in detail the new diagnostic tools for schistosomiasis, and insist on the urgent need for the use of highly sensitive assays, i.e. NAATs or RDTs, not only for travellers, but also for the increasing number of individuals who are repeatedly exposed to mass drug administration with praziquantel in tropical settings, as low-level infection is the rule in both of these groups. Finally, Buonfrate *et al.* provide a very comprehensive review of the diagnostic issues for strongyloidiasis, one of the most challenging parasitic infections, and propose robust guidance on the most appropriate tests to use in different epidemiological and clinical

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scenarios [10]. Hopefully, readers will note that the field of clinical parasitology is also evolving, and that, if the pace seems slower, it is mostly because knowledge gaps still persist regarding the best clinical use of new diagnostic tools in settings as different as travel clinics and tropical health systems. Concerted and close research collaboration between microbiologists and infectious disease specialists is the only way to rapidly deal with these important issues.

Transparency declaration

The author has no conflict of interest related to the present article.

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