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A Scoping Review of the Use of Serological Markers for the Monitoring of *P. vivax* Malaria

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Abstract

By using serological surveillance techniques, it may be possible to locate *P. vivax* exposures, including asymptomatic carriers. Serosurveillance is used in different ways across the world, including differences in methodology and transmission setting. There is no systematic review detailing the benefits and drawbacks of using surveillance in diverse contexts. To standardise and validate the use of serology for the surveillance of *P. vivax* in particular transmission scenarios, these results must first be compiled and compared. Applications for *P. vivax* serosurveillance were reviewed globally from a scoping perspective. There were 94 studies discovered that matched the inclusion and exclusion criteria.

Keywords: Surveillance • Serology • Antibodies

Introduction

One of the top ten killers in low-income nations is malaria. It is brought on by the Plasmodium parasite, of which humans are susceptible to at least five different species: *P. falciparum, P. vivax, P. malariae, P. ovale and P. knowlesi*. The majority of the disease load is caused by *P. falciparum and P. vivax*, albeit these two parasites have different geographic distributions. *P. vivax* is more common in the Americas, Asia and the Pacific, whereas *P. falciparum* is mostly present in sub-Saharan Africa. The World Health Organisation has set the stated aim of eliminating malaria in at least 35 countries by 2030 and *P. vivax*-related malaria is expected to be a significant roadblock in that effort.

The use of serology to identify people who have produced antibodies to *P. vivax*, as this can serve as an indirect marker of exposure to *P. vivax*, is one potential method to get around the drawbacks of blood-stage antigen detection-based diagnostics. Instead of testing for the presence of the parasite, this method looks for antibodies to specific *P. vivax* protein antigens, allowing researchers to deduce from seropositivity that a person has already been exposed to the parasite. Monitoring is essential for the elimination of malaria because it can reveal regional transmission patterns and identify regions that require more targeted.

Literature Review

Surveillance systems' ability to provide information on transmission patterns and occurrences, however, may be compromised if they are unable to recognise asymptomatic people (those with low-density infections, cryptic diseases, or hypnozoites). By making it easier to identify asymptomatic people who would be missed by other diagnostic techniques, serology offers an advantageous tool to support established monitoring techniques. Many other diseases have been monitored using serosurveillance, including the lyssavirus (rabies), dengue virus, chlamydia trachomatis, Human Immunodeficiency Virus (HIV), Hepatitis B Virus and SARS-CoV-2 (COVID-19).

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Indicating that antibody detection offers a longitudinal rather than cross-sectional assessment of malaria, a substantial association was found between seroprevalence estimations and reported annual incidence of *P. vivax* malaria from the national malaria control programmes. Serosurveillance was therefore helpful for logging both recent and long-term exposures, identifying transmission foci and tracking transmission intensity. Additionally, serological findings identify individuals and groups who are more likely to contract malaria as well as personal risk factors. This was done specifically by computing age-specific seroprevalence and seroconversion rates. These findings also provided evidence that malaria had been eradicated.

Discussion

The gold-standard microscopy method was discovered to be more expensive, slower, labor-intensive, and complex than serological methods. Rapid serological tests or dot-ELISAs, both of which can theoretically be conducted and analysed in the field without specialist resources, can further simplify serological procedures for use at point-of-care/contact settings. If the resources are not nearby, blood samples can also be put onto filter paper, dried and kept until they can be transferred to testing labs. This approach was emphasised as a way to evaluate retroactive transmission using historical samples. It was also mentioned that when numerous surveillance systems are in place, the sampling load is reduced because only one blood spot sample per person is needed to estimate the transmission history for various species.

Antibodies are immensely helpful indicators for malaria transmission since they can still be seen in blood samples after the infection has disappeared, indicating that a person has been exposed to *P. vivax* for a longer length of time. Additionally, certain antibody responses develop a lifetime exposure marker as they mature, which is helpful for determining transmission historically as well as at the population level. Serosurveillance is therefore especially well-suited to highlighting locations that may need additional intervention and control measures to stop increasing transmission. Seroprevalence statistics, which are such a potent predictor of transmission, might be used to guide programmes aimed at eradicating malaria and ensuring that resources are directed where they are most needed. As long-incubation malaria patients may be detected as harbouring parasites and treated appropriately before they could contribute to the subsequent peak transmission cycle, this might also be directed towards reducing future transmission. In a series of cross-sectional surveys, for instance, a region of Indonesia was flagged as a potential problem by serological testing; this occurred just before a malaria outbreak there [1-6].

Conclusion

Serosurveillance is a very promising technology that needs to be improved and standardised. To find panels that are appropriate for different

transmission settings, different combinations of serological exposure markers should be investigated. These panels should then be evaluated in relation to the appropriate transmission context and surveillance system. In some cases, this process has already started; it has to be expanded to other serological marker panels. Additionally, it is advisable to standardise serological techniques whenever possible, including the determination of antibody cut-off thresholds. It is important to investigate and characterise the interspecies cross-reactivity of markers and antibodies. Additionally, whenever possible, permissive wording should be included in consent forms when large-scale population health surveys including blood sample collection are done. This will enable extensive validation of markers across epidemiological context.

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Conflict of Interest

There are no conflicts of interest by author.

References

1. Prudêncio, Miguel, Ana Rodriguez and Maria M. Mota. "The silent path to thousands of merozoites: The plasmodium liver stage." *Nat Rev Microbiol* 4 (2006): 849-856.
2. Roberts, David J., Craig, Anthony R. Berendt and Robert Pinches, et al. "Rapid switching to multiple antigenic and adhesive phenotypes in malaria." *Nature* 357 (1992): 689-692.
3. Petter, Michaela, Malin Haeggström, Ayman Khattab and Victor Fernandez, et al. "Variant proteins of the *P. falciparum* rifin family show distinct subcellular localization and developmental expression patterns." *Mol Biochem Parasitol* 156 (2007): 51-61.
4. Howard, Russell J., John W. Barnwell, Edwin P. Rock and Janet Neequaye, et al. "Two approximately 300 kilodalton *P. falciparum* proteins at the surface membrane of infected erythrocytes." *Mol Biochem Parasitol* 27 (1988): 207-223.
5. Bull, Peter C. and Abdirahman I. Abdi. "The role of PfEMP1 as targets of naturally acquired immunity to childhood malaria: Prospects for a vaccine." *Parasitology* 143 (2016): 171-186.
6. Deitsch, Kirk W. and Lars Hviid. "Variant surface antigens, virulence genes and the pathogenesis of malaria." *Trends Parasitol* 20 (2004): 562-566.

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