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## Dynamics of microscopy, rapid diagnostic tests and nPCR positivity during follow-up of malaria patients

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Sri Lanka, after eliminating indigenous malaria in 2012 is in the prevention of re-establishment (POR) phase. Integrated drug efficacy surveillance (iDES), using either microscopy or Rapid Diagnostic Tests (RDTs) to follow-up malaria patients, is recommended for monitoring drug efficiency for countries with low malaria cases. The objective of this study was to determine the dynamics of microscopy and RDT positivity during follow-up of patients, after initiation of treatment. The positivity of microscopy, RDT and nPCR, were monitored for 76 *Plasmodium falciparum* and 76 *P. vivax* nPCR confirmed patients followed up during the period April 2014 - December 2017. Tests were performed on D0 (day of diagnosis), D1, D2, D3 and thereafter weekly on D7, D14, D21 and D28. Microscopy detected 74 *P. falciparum* patients while all 76 were positive for the HRP2 band of the RDTs, but only 55 were positive for the pLDH band. Kaplan Meier analysis showed similar estimated survival probabilities for microscopy, pan pLDH test line and nPCR. The estimated mean survival times by microscopy, nPCR and pan pLDH test line of RDT being 12.7 days (95%CI =11.7-13.7), 12.5 days (95%CI=11.6-13.5) and 12.8 days (95%CI=11.7-13.9), respectively. HRP2 positivity differed significantly due to persistent antigenemia in most of the patients. The estimated mean and median survival times for HRP2 were 23.7 days (95% CI=22.8-24.6) and 28 days (95%CI=26.7-29.3), respectively. Microscopy and RDT detected 75 out of 76 nPCR confirmed *P. vivax* patients. For all three diagnostic tests, the median survival time was 7 days. This study shows that PCR positivity correlated with patent parasitaemia proving accuracy of microscopy. This makes them useful tools for follow-up of malaria patients in a POR setting. Use of RDTs (pan pLDH test line) is acceptable for *P. vivax*. Due to false negativity of pan pLDH test line and persistent HRP2 antigenemia, it is a less valuable tool to follow-up *P. falciparum* patients.

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