Detection of Malaria in Healthy Blood Donors using PCR in an Endemic Area in Yemen

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Abstract:

The transmission of malaria by blood transfusion is one of the most important problems when selecting blood donors in transfusion centres particularly in endemic areas. Traditionally, malaria diagnosis has been made using thick blood smears, but more sensitive techniques are required especially in blood donor screening. The present study aimed at evaluating the diagnostic performance of nested PCR for detection of malaria parasites in healthy blood donors compared with light microscopy. Two hundred blood samples were collected randomly from healthy blood donors presented to the blood bank at the Almukalla Hospital, Hadramout Governorate, Yemen. Light microscopic examination of thin and thick blood smears and nested PCR were performed on the blood samples. Out of the 200 blood samples, 148 were taken from males (74%) and 52 from females (26%), with an average age of 29.8±8.4. Twenty-eight out of the 200 samples (14%) were detected positive for Plasmodium by light microscopy, 2 (1%) of them were identified as Plasmodium vivax and 26 (13%) as Plasmodium falciparum. Thirty-three out of the 200 samples (16.5%) were detected positive by nested PCR, which were all identified as Plasmodium falciparum including 5 samples detected negative by light microscopy. It was concluded that nested PCR is the most appropriate method for population-based screening of blood donors for malaria parasites. It enabled the identification of P. falciparum in a considerable proportion of clinically healthy donors, highlighting the potential risk for transfusion-transmitted malaria. This tool can be adopted for the screening of malaria in haemotherapy centres, especially in malaria-endemic areas.

Keywords:

Malaria, Blood donor, Microscopy, Nested PCR

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