

Molecular diagnosis of *Plasmodium* species using nested Polymerase Chain Reaction (PCR) method

PhyuPhyuWin^{1*}, MyaMoe^{1*}, MoeKyawMyint¹, AungKyawSoe², Yee Mon Myint¹,

ThiThi Htun¹, WinPa Pa Win³ & Khin Lin¹

¹Department of Medical Research (PyinOoLwin, Branch) ²Department of Public Health

³Department of Medical Services

Abstract

Malaria is one of the priority health problems in Myanmar. Provision of early diagnosis and appropriate treatment at primary health care setting is one of the National Malaria Control Strategies. In Myanmar, 1000 deaths were observed in 2001 but it declined to 30 deaths in 2017. Microscopic examination has been widely applied as the gold standard for malaria diagnosis in most part of malaria endemic areas. Recently, Myanmar leads to get malaria elimination in the year 2030. This study was done to determine Molecular diagnosis of *Plasmodium* species using nested PCR method. Cross-sectional comparative study for detection of *Plasmodium* species among clinically suspected malaria patients were done in Naung Cho and PyinOoLwin Township in 2018. After getting informed consent agreement, explaining risks, benefits and procedures of the study, clinically suspected malaria cases were included into the study. Total 245 participants were detected by microscopy examination and nested PCR method for diagnosis of *Plasmodium* species infection. Male were 73.9 % and female were 26.1%. Among them, 195(79.6%) cases were diagnosed as negative and 50(20.4%) cases were positive according to microscopic examination. The species identified were 3(1.2%) cases *Plasmodium falciparum*, 46(18.8%) *Plasmodium vivax* cases. One(0.4%) case was *Plasmodium falciparum* and *Plasmodium vivax* mixed infection. On the other hand 183(74.7%) cases were diagnosed as negative and 62(25.3%) cases were positive according to PCR method. The species identified were 58(23.7%) cases *Plasmodium vivax*, 3(1.2%) cases *Plasmodium falciparum*. One (0.4%) case was *Plasmodium falciparum* and *Plasmodium vivax* mixed infection. In conclusion, the accuracy of routine microscopic examination was analysed by against to species-specific nested PCR method. The gold standard method (microscopy) is less sensitive because additional 6(2.4%) positive cases were detected by the PCR method. These results suggest that molecular diagnostic approach is more reliable than microscopic examination for the accurate diagnosis of *Plasmodium* species as a part of the National Malaria Control Program (NMIP) in Myanmar.