**A Study on the *Plasmodium vivax* Relapse Pattern and Identification of Dominant Genotype in Far-Western Nepal**

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**Background**

Malaria is a major public health problem in Nepal. Out of 27.3 million populations of the country, 22.5 million people still live in malarias endemic areas. In Nepal, around 70 percent of the total populations are believed to be at risk to malaria. Since 1950, chloroquine was used as first line drug, but sulfadoxine-pyrimethamine (SP) was introduced after the emergence of *P. falciparum* resistant to chloroquine, and later established it as the first line drug for the treatment of microscopically confirmed uncomplicated *P. falciparum* malaria. However, the Government of Nepal has recommended 5 days treatment 7 with primaquin for vivax malaria. But the standard treatment with primaquin requires 14 days to prevent relapse except in those cases with Glucose-6-phosphate dehydrogenase (G6PD) deficiency, and in infants and pregnant women. Finding of different studies show that the relapse rate in *P. vivax* malaria is highly variable, ranging between 2% to 44% even after treating them with chloroquine. And the relapse mainly occurred during the first three months after the first attack. The present study is an attempt to understand the rate of relapses in Nepalese context to elucidate their transmission dynamics for planning vector control strategies and chemotherapeutic measures in *P. vivax* foci.

**Methods**

Altogether, six health centers were chosen from the Kailali and Kanchanpur district; three from each district. The respective health centers were selected on the basis of maximum number of malaria positive cases reported preceding year. The study tried to find out the relapse pattern of *P. vivax* for the period of six months from December 2010 to May 2011. All patients of age group more than 6 months to 65 years of age during the study period of the study area were considered eligible for the study. Initially, demographic profile of the patients was recorded. Later clinical examination, axillary temperature measurement, blood slide examination was done to screen the patient. A record book was kept in which all the relevant information regarding age, sex, address, temperature, blood film etc. of the screened cases was entered. The demographic and other data were entered in Ms-Excel 2007 and analyzed in Statistical Package for Social Science software 13.0 version.

**Results**

Age-group 21- 30 years had the highest distribution with 34 percent participation. Twenty nine percent and 17 percent of the patient belonged to the age-group 10 to 20 and 31 to 40 years respectively. Only 4 percent cases were observed in the age group 60 above years. In our study, 81 percent were male and 19 percent were female. Out of total malaria blood samples, 23 cases (17%) were relapsed during six months period. Random Fragment Length Polymorphism (RFLP) is a method used in distinguishing between selected genotypes within a species. Random Fragment Length Polymorphism was carried out on 100 *P. vivax* species identified in Nepali malarial cases. The study looked into distinguishing two major genotypes of *P. vivax* namely VK210 and VK247 within the *P. vivax* species which have been identified in South Asian cases, especially in neighboring India. Results of 100 samples showed a net success rate in positive identification of 84% samples whereby all the isolates were found to be VK210 genotype.

**Conclusions**

Extending the study in other endemic districts of Terai belt of Nepal taking representative samples can reflect the true picture of the genetic heterogeneity of *P. vivax* in entire Nepal which can help understand the detailed malarial epidemiology in Nepal

**Keywords:** genotypes; health centers; malaria; *Plasmodium vivax*; relapse pattern.