

**Development of high pressure liquid chromatographic methods for determination of antimalarial drugs and their applications in malaria endemic areas**

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**Doctor of Philosophy (Clinical Pharmacology)**

**University of Dar es Salaam, School of Health Sciences, 2005**

The objective of this work was to develop high performance liquid chromatographic (HPLC) methods and apply them in assessing the pattern and extent of antimalarial drug utilization and their quality in Tanzania. The drugs investigated were amodiaquine, chloroquine and sulfadoxine/pyrimethamine. Pyrimethamine and chloroquine filter paper methods and another HPLC method for measuring amodiaquine in human biological fluids were developed at Karolinska Institute (KI), in Sweden and were applied at MUCHS to carry out a quality assessment of antimalarial collected from wholesale importers in Dar es Salaam and to investigate diffusion of new malaria treatment policy in a rural community in Tanzania. The collected brands of sulfadoxine/pyrimethamine and amodiaquine tablet formulations were tested for content of active components and dissolution characteristics. Comparison of bioavailability of two SP formulations was conducted using healthy volunteers. Blood samples (100) were collected and assayed for levels of sulfadoxine and pyrimethamine using HPLC methods. In households at Kibaha district, mothers with children under five years of age were interviewed on treatment practices of malaria. Capillary blood was collected on filter paper in duplicate from one under five in all the households with children. The samples were assayed for chloroquine and sulfadoxine/pyrimethamine using HPLC methods. Drug levels were used to assess drug pressure and extent of diffusion of the new malaria policy in the area. The developed analytical methods are capable of applying small volumes of blood making them suitable for field studies, in resource limited settings. By applying these analytical methods, it was possible to confirm dissolution failure rates of 13% and 44% of the collected AQ and SP samples respectively. By combining mothers' interviews and drug level analysis, it was possible to confirm that the new malaria treatment policy had diffused and there was low SP overprescribing at Kibaha district. It can be concluded that HPLC methods applying small volume of blood samples especially dried samples on filter paper are useful tool in epidemiological studies as well as pharmacokinetic studies in resource constrained analytical laboratories of developing countries.

