STUDIES ON THE HETEROGENEITY OF RESPONSE OF THE
PLASMODIUM FALCIPARUM MALARIA PARASITE TO
DIFFERENT DRUGS, WITH PARTICULAR REFERENCE TO
IRAN JAYA, INDONESIA

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Jayapura, Irian Jaya, is an area of mesoendemic malaria where infections with
P. falciparum and P. vivax are very common. There is a high morbidity and mortality
from malaria and a proportion of infection are resistant to available drugs such as
chloroquine.

In vitro testing of 42 isolates of P. falciparum showed that 90.5% showed
resistance to chloroquine. Sensitivities in vitro to the following pairs of drugs were
significantly correlated: chloroquine and amodiaquine, mefloquine and quinine,
quine and sulfadoxine/pyrimethamine.

Studies on response to quinine in vitro showed a normal response in 28/33
patients (84.9%). The in vitro response to quinine did not reliably predict the in vitro
response.

Isolates of P. falciparum in Jayapura showed evidence of heterogeneity in drug
response. The most common pattern of sensitivity (57.1%) is R-S-S-S indicating resis-
tance to chloroquine and sensitivity to amodiaquine, quinine and mefloquine. The
second most common pattern (19.1%) is resistance to all drugs (S-S-S-S) and
resistance to chloroquine and quinine (S-S-S-S). In laboratory studies, an isolate of
P. falciparum from West Africa was shown to contain chloroquine resistant, and the
more chloroquine-resistant had higher growth rates.

The parasite isolates made from the patients in the study were tested using a
series of monoclonal antibodies in the indirect fluorescent antibody test. Evidence of
the occurrence of sero groups I, V and VI was obtained.

Immune sera from Jayapura inhibited merozoite invasion in vitro. They were
also capable of lesser extent of inhibiting intracellular growth. Immune sera from
Jayapura were more inhibitory to the PQ-27 strain originating from the neighbouring
country, Papua New Guinea, than to 2 strains from other areas.

It is recommended that the increase in chloroquine resistance and sensitivity to
other antimalarials in Indonesia should be continuously monitored.

Extended and more definitive studies are required in attempts to obtain greater
accuracy in antigen serotyping and on growth inhibition of P. falciparum in Indonesia
by immune sera.