Wampfler *et al. Malaria Journal* 2014, **13**(Suppl 1):O24
http://www.malariajournal.com/content/13/S1/O24

MALARIA JOURNAL

ORAL PRESENTATION Open Access

Dynamics of *P. vivax* clones in a cohort of children with or without primaquine treatment at baseline

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From Challanges in malaria research: Core science and innovation
Oxford, UK. 22-24 September 2014

P. vivax was detected by PCR in 45% of children aged 5-10 years from our study area in Papua New Guinea (PNG). 504 children were randomized into 2 arms according to Primaquine (PQ) treatment or not at baseline and actively and passively followed for 9 months. We genotyped all *P. vivax* infections, the majority of these being multi-clone infections. All blood samples positive for *P. vivax* by qPCR were tested for gametocyte carriage by targeting *pvs25* transcripts. Primaquine reduced the risk of *P. vivax* infections by 80%. The multiplicity of infection and the density of asexual *P. vivax* stages were not significantly different in both treatment arms. The number of new clones (force of blood-stage infection) was 2.38 ± 0.17 per person per year-at-risk in the PQ-arm compared to 8.04 ± 0.41 in the Placebo arm ($P < 0.05$). The duration of infections did not differ between the treatment arms, with 73 days [95% CI: 33-849] and 68 days [95% CI: 40-247] in the PQ or Placebo arm, respectively. Detectability of *P. vivax* clones was low with 0.26 ± 0.06 and 0.24 ± 0.04 in the PQ and Placebo arms. PQ-treated children had a 75% lower risk of carrying gametocytes compared to Placebo recipients. *P. vivax* positive children in both arms were equally likely to show gametocyte positivity. We conclude that *P. vivax* relapses contribute significantly to the high burden of *P. vivax* infection and transmission in PNG. All other infection dynamics parameters were consistent between treatment arms and apparent relapses behave like new infections.

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Published: 22 September 2014

doi:10.1186/1475-2875-13-S1-O24
Cite this article as: Wampfler *et al.*: Dynamics of *P. vivax* clones in a cohort of children with or without primaquine treatment at baseline. *Malaria Journal* 2014 **13**(Suppl 1):O24.

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