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Paper Poster Session

Clinical parasitology and epidemiology

Combination effect of extract brotowali (*Tinospora crispa*) and artesunate injection against expression of intercellular adhesion molecule- 1 (ICAM-1) and the histopathology of glomerulus in mice infected by *Plasmodium berghei*

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Background: Kidney dysfunction often occurs in adult malaria patients and it is a sensitive indicator in severe malaria, however its pathogenesis has not been well known yet. Brotowali (*Tinospora crispa*) is a traditional plant that contains tinocrisposide, aporfin, berberine and palmatin, which are known as antimalarial and antiinflammation

Aim : To determine the effect of extract brotowali (*Tinospora crispa*) in reducing histological damage and level of ICAM-1 expression in glomerulus of *Plasmodium berghei* infected mice and treated with artesunate.

Material/methods: This laboratory experimental research was post-test only control group design using the mice strain C57BL/6J were divided into negative control group, positive control group, artesunate injection group, oral brotowali group, and combination of artesunate with multiple doses of brotowali 50mg, 60mg and 70mg per day, where each group was dissected on day 7 and day 14. The level of glomerular histopathology damage was determined by Hematoxylin-Eosin (HE) staining, while the level of ICAM-1 expression was measured by immunohistochemical method.

Results: Mann-Whitney test showed that, compared to positive control group, administration of 70mg brotowali until day 14 improved glomerular necrosis ($p=0.029$) and degree of proliferation mesangial on day 7 and 14 ($p=0.011$; $p=0.045$) however the value did not reach the negative control ($p < 0,05$). The combination of artesunate-brotowali until day 14 doses of 50,60,70mg repaired glomerular necrosis ($p=0.029$; $p=0.029$; $p=0.029$) and mesangial proliferation ($p=0.000$; $p=0.000$; $p=0.004$). Brotowali until day 7 and 14 also decreased the level of expression of ICAM-1 ($p=0.000$; $p=0.000$) as well as combination of 60mg on day 7 and 14 ($p=0.011$; $p=0.023$), 70mg on day 7 ($p=0.029$). Spearman correlation test showed a negative correlation between the dose of brotowali in combination with the expression of ICAM-1 on day-7 ($r=-0.471$ $p=0.001$), positive correlation between expression of ICAM-1 and the degree of glomerular necrosis at day 14 ($p=0.000$; $r=0.490$), positive correlation between expression of ICAM-1 and the degree of proliferation mesangial on day 14 ($p=0.000$; $r=0.327$).

Conclusions: The combination of artesunate and extract brotowali (*Tinospora crispa*) can improve the histopathology damage and decreased the expression of ICAM-1 in glomerular mice infected by *Plasmodium berghei* with the optimal dose of 60mg/day for 7-14 days or 70mg/day for 7 days. Increased expression of ICAM-1 in glomerular associated with an increased degree of glomerular histopathology damage