Reduce spleen-IFN-γ correlated with CXCL9 levels during Cerebral Malaria Phase in *Annona muricata*-treated swiss mouse study

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Introduction

- Cerebral malaria (CM) cause malaria mortality. Anti-plasmodial and immunomodulatory properties of *A. muricata*-leaf extract (AME) may provide benefices for CM-patients.

- IFN-γ, a pivotal cytokine in the CM-immunopathology, is modulated by CXCL9, IL-10 and IL-12.

- The aim was to determine factors correlated with spleen-IFN-γ production in healthy and CM phase with/without ethanolic AME treatment.

Material and Method

- A post test only control group design study using 30 swiss mice randomly devided in 6 groups was performed.
- The *Plasmodium berghei* ANKA (PbA)-inoculated and healthy mice were grouped in C(+) and C(-).
- The healthy mice treated with AME 100 and 150 mg/Kg BW/day were grouped in X1 and X2.
- The PbA-inoculated and received either AME dose were grouped in X3 and X4.
- Phytohemaglutinin (PHA) induced spleenocyte IFN-γ production, while lipopolysacharide (LPS) induced IL-10, IL-12 and CXCL9. Elisa was used to measure the observed cytokine production.
- One-way ANOVA and post hoc test were done in normally distributed data; otherwise Kruskal-Wallis and Mann-Whitney test were used.

Results

- IFN-γ were significantly lower in C(+), X3 and X4 than C(-) group, and this was also observed in CXCL9.
- IL-10 were significantly higher in X3 and X4 than C(+) group ($p=0.003$ and $p=0.004$). IL-12 were not different among all six groups ($p=0.071$).
- Spearman correlation test showed a correlation between IFN-γ and CXCL9 produced during CM-phase regardless AME treatment ($r=0.581$; $p=0.009$)
- IFN-γ was correlated with IL-10 levels in healthy groups with/without AME treatment ($r=0.544$; $p=0.029$).

Conclusion

- The reduce spleen-IFN-γ production might regulate differently in healthy and CM phase.