

Non-correlation between CRP and rapid diagnostic tests for malaria among rural population in Southern Uganda (Original research paper)

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Original Article

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Abstract:

The correlation between CRP blood levels and clinical presentation of malaria or blood parasitemia diagnosed microscopically or by PCR is one of the most discussed topics in the field of tropical medicine and malaria diagnostics. In total, 650 patients from the Lake Victoria area,

which is of high risk for malaria were included in this study. In patients with febrile episodes, CRP tests were done together with the RDT for malaria. In 239 cases with CRP positive malaria, only 119 (51%) showed RDT malaria positive. CRP does not correlate with proven RDT for malaria. Patients with fever due to infection caused by *Pl. falciparum* can be CRP negative and vice versa, CRP positive patients may have negative RDT for malaria.

Conflict of interest:

The authors whose names are listed in the title of the article certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, or other equity interest), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

Introduction

South East Uganda has a significant migrating (IDP and refugees) population. This is mainly due to the instability of surrounding countries and famine in South Sudan, Northern Kenya and Nigeria. At the same time, being near Victoria Lake makes this area high risk of malaria due to the proximity of the water source and the altitude. RDTs are often a useful diagnostic tool for malaria, HIV and other infectious diseases where RDTs are available. Lack of resources, staff and infrastructure make them ideal for "field conditions". Moreover, CRP is also a relatively cheap and available diagnostic option for patients with fever. The correlation between CRP positivity and RDT positive malaria test could be lifesaving. The aim of this study was to assess whether a correlation exists in this area of rural settings with highly vulnerable population.

Patients and methods

651 patients presented with fever at the local OPD center. In the diagnostic algorithm, also malaria RDT and CRP tests were done. Patients with positive RDT underwent

microscopic confirmation of malaria parasites. Statistical correlation for CRP and RDT positive patients was performed with χ^2 test and EPI-info statistical package was used for evaluation of the results.

Table 1: Patients with fever and diagnostics of malaria in Buikwe, South East Uganda

Total	605
CRP<20, MPS -, RDT -	297
CRP<20, MPS +, RDT+	18
CRP>20, MPS-, RDT-	185
CRP>20, MPS+, RDT+	103
CRP>20, MPS+, RDT-	1
CRP<20, MPS-, RDT+	1

Results and discussion

Among 650 patients, 178 had microscopically confirmed malaria (27.38%). Of those, 103 (57.87%) had also CRP blood level elevated $>50\mu\text{g/l}$. Of the 297 malaria negative patients, 183 had CRP elevated above $50\mu\text{g/l}$, probably due to the

bacterial infection (all above 50µg/l, median 71.33µg/l). Therefore, we can say that CRP elevation is not typical for malaria and threshold 20µg/l cannot be predictable for malaria diagnostics. In some studies threshold is even 100µg/l ().

Conclusion

Threshold level 50µg/l for CRP cannot be predictive marker for malaria diagnostics in endemic region, such as South East Uganda. Patients with a CRP level above 50µg/l did not have significantly more positive RDTs for malaria and vice versa.

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