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Associations between TNF-α, IL-10 and Il-6 plasma cytokine levels and TNFα and TNF β polymorphisms in *Plasmodium falciparum* malaria with respect to disease severity

Plasma cytokine levels and TNF α/β polymorphisms is central focus in the studies of sever P. falciparum malaria. In the present study TNF α/β genotypes based on TNF α1, TNFα2, TNFβ1 and TNF β2 alleles were analyzed with respect to TNF-α, IL-10 and IL-6 plasma cytokine levels in 24 severe and complicated (SC) and 25 uncomplicated (UC) P.falciparum infected patients. The results indicated that there was a significant association between the presence of TNFα1.2 genotype in the SC category of patients

with respect to TNF-α(p=0.001), IL-10 (p+0.01) and Il -6 (p=0.005) levels compared to that of UC. Such association was not found however with TNFα1.1genotype, between SC and UC categories. Further, it was observed compared to UC category were restricted to only IL-6(p=0.000) and TNF-α (p=0.002), but not with the IL-10 (p=0.199). When the TNFα and TNF β genotype combination were included in this analysis, it was found that only the combination of TNFα 1.1/TNFβ 2.2 was significantly associated with the higher levels of only Il-6 in the SC category compared to UC category (p=0.004).

These results suggest that TNFα1.2 and TNF β 1.2 genotypes may be involved in inducing severe pathology of *P. falciparum* disease through the immunopathalogical mechanisms based on the tasted cytokines. These involvements changed however when TNFα / TNF β genotypes considered together to analyze their capacity to induce severe pathology as only the TNFα 1.1/TNFβ 2.2 genotype combination was found to significantly elevate only IL-6 levels in SC compared to that of UC.