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Systemic and mucosal concentrations of nine cytokines among individuals with Neisseria gonorrhoeae infection in Nairobi, Kenya

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Background

The human-restricted sexually transmitted Neisseria gonorrhoeae (NG) has been shown to modulate the immune response against it and consequently the cytokines produced. The levels of cytokines in NG infection in the African population have not been well described.

Aim/Methods

We aimed to quantify the systemic and mucosal cytokines in NG infection.This was a comparative cross-sectional study. Levels of nine cytokines (IL-1β, IL-2, IL-4, 1L-6, 1L-10, 1L-12p70, IL-17A, TNF-α and INF-γ) were measured from plasma and genital samples (urethral swabs in men and cervicovaginal lavage in women) from 61 Neisseria gonorrhoeae infected individuals seeking treatment for sexually transmitted infections (STIs) at Casino Health Centre in Nairobi, Kenya. A comparative group of 61 NG-uninfected individuals, seeking treatment at the same facility but with laboratory-confirmed negative Neisseria gonorrhoeae, Chlamydia trachomatis (CT), Mycoplasma genitalium (MG) and Trichomonas vaginalis(TV) was also included. The Mann-Whitney U test was used to compare the cytokine levels between NG-infected and uninfected individuals. Data was analyzed using STATA ver. 15.1.

Results

Overall, systemic IL-6, TNF-alpha and IL-10 were elevated while genital IL-10 and TNF-alpha were lower in NG positive participants. On subgroup analysis by sex, the levels of genital IL-1beta and IL-6 and systemic IL-6 were elevated in NG-infected men. None of the genital cytokines were elevated in NG-infected women,

while all systemic cytokines, except INF-γ, were elevated in NG-infected women.

Conclusions

Neisseria gonorrhoeae induced the production of different cytokines in men and women, with men having a pro-inflammatory genital response. These differences should be taken into consideration during development of various interventions e.g. vaccine development.