

Antibody to Rmp (outer membrane protein 3) increases susceptibility to gonococcal infection

Abstract:

The severe adverse effects of gonococcal infection on human fertility suggests that *Neisseria gonorrhoeae* would exert powerful selection for the development of a protective immune response in humans. *N. gonorrhoeae* is an obligate human pathogen and must persist in humans to survive. Since it is an ecologically successful organism, it must have evolved strategies to evade any human immune response it elicits. In a longitudinal study among 243 women working as prostitutes and experiencing frequent gonococcal infection, younger women, women with HIV infection, and women with antibody to the gonococcal outer membrane protein 3 (Rmp) were at increased risk of infection (adjusted odds ratio 3.4, CI95% 1.1-10.4, $P < 0.05$). Rmp is highly conserved in *N. gonorrhoeae* and the blocking of mucosal defences may be one of its functions. As similar proteins occur in many gram negative mucosal pathogens, the enhancing effect of such proteins may be a general strategy whereby bacteria evade human immune responses. PIP: Between March 1985 and July 1986 researchers enrolled 243 female prostitutes in Pumwani community of Nairobi, Kenya, in a longitudinal study to examine the relationship between the antibody to the gonococcal outer membrane protein 3 (Rmp Ab) and gonococcal mucosal infection. Few women used condoms. 69% were HIV-1 seropositive. Just 9.5% (23) of the women had not had any gonococcal infections, despite probable exposure to them, indicating the possibility of some acquired protective immunity to *Neisseria gonorrhoea*. 90.5% had had at least 1 gonococcal infection. Women with Rmp Ab faced a greater risk of gonococcal infection than those who were Rmp Ab negative (OR = 3.4; $p .05$), denoting that Rmp Ab increases susceptibility to gonococcal mucosal infections. Women older than 29 years were at lower risk of gonococcal infection than those younger than 29 years (odds ratio [OR] = 0.3; $p .03$). Women who used oral contraceptives (OCs) were also likely to be infected with *N. gonorrhoea* (OR = 3; $p = .062$). Further, 31% of OC users had cervical ectopy compared to just 14% of nonusers (OR = 2.8; $p .005$), suggesting that the effect of OCs on the cervix make it more susceptible to gonococcal infection. Rmp Ab also exists in many other gram-negative mucosal pathogens, often playing the same role as it does in *N. gonorrhoea* infection. Thus, Rmp Ab may be a common scheme bacteria used to elude human immune responses. These findings provide more understanding as to why *N. gonorrhoea* is an ecologically successful human pathogen