EPIC-STI PROJECT 3 (KONG): A Mixed Methods Study of STI Co-infections and Cervical Immune Microenvironment

SUMMARY

The need to obtain better basic epidemiologic data on the burden of sexually transmitted infections (STIs) and co-infections and to conduct translational studies in human populations to expand the knowledge base on mucosal immunity in the genital tract were among several critical research gaps identified by expert panels convened to identify barriers to effective prevention and control of STIs and their disease sequelae. Using a mixed design approach, Project 3 of the Epidemiology Prevention Interdisciplinary center for STIs (EPIC-STI) will address these two research gaps in the following specific aims. Aim 1 will utilize a novel data and biospecimen resource, the New Mexico HPV Pap Registry (NMHPVPR), to conduct a population-based survey of age-specific prevalence of four common STIs – *Chlamydia trachomatis* (CT), *Neisseria gonorrhea* (NG), *Trichomonas vaginalis* (TV), and *Mycoplasma genitalium* (MG). The results from Aim 1 of this project and the human papillomavirus (HPV) prevalence estimates derived in Project 4 of the EPIC-STI will be combined to provide a comprehensive evaluation of the age-specific prevalence of co-infections with the most common viral, bacterial, and protozoal sexually transmitted infections in an ethnic and geographically diverse population in New Mexico, which ranks 8th in Chlamydia infection in the United States. In synergy with Project 4, Aim 2 will investigate the association between CT, NG, TV, and MG co-infections with high risk (HR)-HPV on the development of high grade cervical intraepithelial neoplasia (CIN2+). By linking the STI testing in Aim 1 with the NMHPVPR, we will improve on previous studies evaluating the role of CT infection with the development of CIN2+ and cervical cancer by linking co-infections on an individual basis to the NMHPVPR reportable disease outcomes, enabling a unique opportunity to study the long term consequence of STI and HR - HPV co-infections. Finally, a prospective cohort study will be conducted in Aim 3 to describe the immunological microenvironment in CT-infected women and a control group of CT uninfected women by measuring a panel of 60 soluble immune markers (cytokines, chemokines, growth factors, antibodies) from sequentially collected cervical secretion samples before and after azithromycin treatment. Through extensive collection of STI co-infection and behavioral epidemiologic data, this aim will also provide the opportunity to evaluate differences in immune profiles in (1) CT positive symptomatic and asymptomatic women, (2) before and after antibiotic treatment, (3) women with persistent vs. resolved infection at treatment, and (4) women with and without reinfection within 1 year. Aim 3 will provide critical data and biological material to Projects 1 and 2 of the EPIC-STI, creating a necessary bridge between animal and human studies targeting a better understanding of the immune response to CT infection and effective vaccine development.