

NFOG THESIS REGISTRY

Disputant's name: Marjut Rintala

Affiliation: gynecologic oncology fellow at Department of Obstetrics and Gynecology, Turku University Hospital

e-mail: marjut.rintala@tyks.fi

Human papillomavirus infections in infants and their parents – a Finnish Family Cohort Study

The prevalence, natural history and transmission dynamics of genital and oral human papillomavirus (HPV) infections in early childhood and within families are unknown. The Finnish HPV Family Study was designed to analyze HPV in serial samples from mothers, fathers and infants in a 3-year prospective setting. In total, 331 mothers, 131 fathers and 324 infants were enrolled. Scrapings from the genital and oral mucosa were taken at baseline, and at 2, 6, 12, 24 and 36 months. HPV DNA was detected by nested PCR and confirmed by hybridization using a cocktail of 12 high-risk (HR) oligoprobes. Sera from the first 76 families were analyzed for antibodies to L1 proteins of HPV 1, 6b, 11, 16 and 18 using capture ELISA with GST fusion proteins as antigens. In addition, the detection of HPV DNA was studied in samples of vas deference, semen and urine of 27 men undergoing vasectomy.

HR-HPV DNA was frequently detected both in genital (4-25%) and oral (7-34%) mucosa of mothers, fathers and infants during the follow-up. HPV DNA was also found in 20% of semen and vas deferens samples. The oral and genital HPV-infections of the mothers, but not of the fathers, were risk factors for HPV positivity of the infants suggesting vertical transmission between mothers and infants.

At delivery, HPV DNA was detected in the genital and oral mucosa of 10-15% of the infants, and HPV prevalence was the highest (14-21%) at the age of six months. Oral HPV infection persisted in 10% of infants, and here persistent oral HPV of both parents and hand warts of the mother were risk factors. These results implicate nonsexual HPV transmission via saliva and hands. Genital HPV persisted in 1.5% of the infants, and a maternal history of genital warts was a risk factor.

The natural history of HPV infection in the oral mucosa of parents mimics that in the cervical mucosa. Parents acquired HPV similarly, but fathers cleared the virus earlier than mothers. Persistent oral HPV of the spouse was a significant risk factor (OR 10.0) for persistent oral HR-HPV, but oral sex or genital infection of the spouse did not affect the persistence.

HPV antibodies were frequently detected in mothers, fathers and infants. Seroconversion occurred in 34% of the infants during their first year of life; HPV 6/11 were the most common types.

The present results suggest that HPV DNA of the infants can be transmitted vertically, mostly from the mother via saliva and hands. The role of the father as an HPV transmitter is less important. Infants seroconvert for mucosal papillomaviruses during their first year of life.

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