Human papillomavirus infection

Virology

Papillomaviruses

- Non-enveloped, double stranded DNA viruses
- 55nm diameter
- Circular genome
- Epitheliotropic (except BPV)
- Host and tissue specific

Human papillomaviruses

- Over 150 types
- Cutaneous warts – types 1, 2, 3, 4, 5, 7
- Ano-genital warts – types 6, 11
- Ano-genital high grade dysplasia (intraepithelial neoplasia) and squamous cell carcinoma – types 16, 18 (also 31, 33, 35)

Methods for detecting HPV infection

- Clinical
- Cytology/Histology
- Electron Microscopy
- Immunocytochemical
- Gene detection methods
- Specific serology

Human papillomavirus infection

Immunology

Human papillomavirus immunology

Adaptive immune responses

Type 1	**Type 2**
CD4+ cells	CD4+ cells
Interferon-γ	Interleukin 4
Activated macrophage	Humoral immunity
CD8+ T cells	
NK cells	
Cytotoxic antibodies	

Human papillomavirus immunology

- Spontaneous clearance of warts 20-34%
- Clearance with treatment 60%
- Persistence despite treatment 20%

Immunological response to HPV infection

- Invasion of CD4 cells
- HLA-DR and ICAM-1 expressed on keratinocytes
- mRNA expression pattern consistent with Th1or mixed Th1/Th2 cytokine responses
- IL4 and IL5 mRNA expression in recurrent warts

Ref: Grasseger A, 1997

Reasons why papillomavirus is a poor natural immunolgen (1)

- Non-lytic virus:
- Little release of antigens to the immune system
- No local cytokine release to invoke a response
- No systemic phase
- Little professional antigen presentation

Ref: Frazer 1998

Reasons why papillomvirus is a poor natural immunogen (2)

- Non-immunogenic self-mimicry
- Resting skin is anti-inflammatory
- Interleukin-10 and transforming growth factor-β secretion

I Frazer 1998