



HSV-2, HPV, Molluscum contagiosum virus & CMV

UG module

Microbiology 8

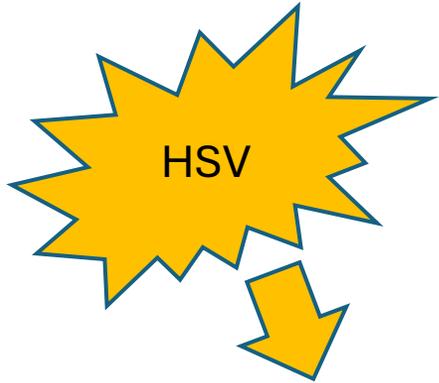
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Genital herpes

Genital herpes

- Etiology: most commonly HSV-2
- Transmission:
 - Direct contact with mucosal tissue or secretions of another infected person
 - HSV-2 is mostly spread through genital contact

Pathophysiology



Inoculation

Neurovirulence:
The virus invades,
spreads, and
replicates in nerve
cells.

Latency:
the virus remains
dormant in the
ganglion neurons
(Sacral ganglion)

Reactivation:
triggered by various
factors (e.g., stress,
trauma) → clinical
manifestations.

Clinical features

- Affected individuals are often asymptomatic or have mild symptoms but may still be at risk of transmission.
- Before the skin lesion, the patient might be presented with redness, swelling, tingling, pain, and pruritus.
- **Primary infection:**
 - Genital tract: skin lesions (erythematous vesicles) in the anogenital area, cervicitis, white, thick, and/or foul-smelling vaginal discharge
 - Urinary tract: dysuria, urethritis
 - Associated symptoms: fever, headaches, myalgias, malaise, tender bilateral inguinal lymphadenopathy

Clinical features

- **Recurrent infection**

- pain or tingling in the genitals, legs, buttocks, and/or hips
- Skin lesions are usually unilateral, less painful, and of shorter duration than in the initial infection.

Management

- **Diagnostics:** Make a clinical diagnosis of HSV infection or reactivation.
 - Confirm diagnosis with PCR and/or viral culture in patients with suspected infection or reactivation regardless of symptoms.
- **Treatment:** Acyclovir
- Antiviral treatment effect: Decrease in duration and severity of infection, Reduction of viral shedding, However, **recurrence cannot be prevented.**

Human papillomavirus infection (HPV)

Human papillomavirus

- Double-stranded, circular, nonenveloped DNA virus with an icosahedral capsid
- Low-risk HPV types 6 and 11:
 - Anogenital warts (condylomata acuminata)
 - Mild cervical cell abnormalities
 - Tumors of non-genital mucosal membranes (e.g., respiratory tract, oral cavity)
- High-risk HPV types 16, 18, 31, and 33
 - Cervical cancer (responsible for 70% of cases)
 - High risk of anogenital, oral, and oropharyngeal squamous cell carcinoma
- HPV types 1, 2, and 4: cause skin warts, such as common warts and plantar warts

Human papillomavirus

- **Route of transmission**

- Transmission occurs between two epithelial surfaces.
- Close personal contact: cutaneous warts
- Sexual contact: anogenital lesions

- **Pathogenesis**

HPV expresses the following **oncoproteins E6 and E7** that facilitate cellular transformation by **inactivating tumor suppressor proteins**, such as p53 and retinoblastoma (Rb), leading to uncontrolled cell proliferation and the development of HPV-related cancers.

Genital intraepithelial neoplasms

- Pathogen: HPV types 16 and 18
- **Classification:**
- Squamous intraepithelial lesion: low-grade or high-grade, such as Cervical intraepithelial neoplasia, Penile intraepithelial neoplasia, and Anal intraepithelial neoplasia.
- Squamous cell carcinoma such as Cervical cancer, Carcinoma of the penis, and Anal cancer.

Condylomata acuminata (anogenital warts)

- **Pathogen:** HPV types 6 and 11
- **Location:** ♀: vulvar, cervix, anal region,
♂: glans penis, foreskin, urethra, anal region
- **Clinical features:** Exophytic, cauliflower-like lesions. Often asymptomatic; may cause pruritus, tenderness.
- **Diagnostics:** Visual inspection, Application of 5% acetic acid turns lesions white.
- **Treatment:**
 - Cryotherapy: freezing external warts with CO₂, or N₂

Flat condylomata

- **Pathogen:** particularly HPV types 3 and 10
- **Clinical features:** flat, white-brown, slightly elevated, scattered plaques in the anogenital region
- **Diagnostics:** visual inspection
- **Treatment:** Curettage or laser surgery.
- Regular checks: necessary because of the high risk of malignancy

Non-anogenital manifestations:

- **Common warts:** Lesions are plaques or papules, Skin-coloured or whitish usually firm, often with a rough and scaly surface, located on the elbows, knees, fingers, and/or palms.
- **Plantar warts:** Rough, hyperkeratotic lesions on the sole of the foot often grow inwardly and cause pain while walking.
- **Flat warts:** Multiple small, flat patches or plaques localized on the face, hands, and shins.

Non-anogenital manifestations:



Treatment

- There is no treatment for the infection itself. In most cases the infection clears up without any treatment.
- For the treatment options of HPV–related anogenital warts, routine clinical monitoring is important.



Molluscum contagiosum



Molluscum contagiosum

- **Pathogen:** a DNA poxvirus (molluscum contagiosum virus)
- **Transmission:**
 - Direct skin contact (contact sports, sexually transmitted)
 - Autoinoculation (scratching or touching lesion)
 - Fomites (e.g., on bath sponges/towels)

Molluscum contagiosum

- Physical examination: single or multiple lesions in healthy patients; especially widespread in immunocompromised patients.
- Nontender, skin-coloured, pearly, dome-shaped papules with central umbilication
- Predilection sites:
 - In children: face, trunk, and extremities (e.g., axilla, and antecubital)
 - In adults: lower abdomen, groin, genitalia, and proximal thighs.

Molluscum contagiosum



Molluscum contagiosum

- **Treatment:** Spontaneous remission of the lesions usually happens within a few months; thus, treatment is often unnecessary.
- If treatment is indicated (e.g., for sexually transmitted molluscum contagiosum), cryotherapy with liquid nitrogen is usually the first treatment option.



Cytomegalovirus infection



Cytomegalovirus infection

- **Pathogen:** cytomegalovirus (CMV, human herpes virus 5, HHV-5)
- **Transmission:**
 - Blood transfusions
 - Sexual transmission
 - Transplacentally
 - Perinatal transmission (e.g., contact with contaminated blood/vaginal secretions during delivery or breastfeeding)
 - Body fluids (e.g., respiratory droplets, saliva, urine, genital secretions)

Clinical features:

- CMV infection is usually asymptomatic. Severe manifestations occur in patients with immunocompromise.
- **Immunocompetent patients:** > 90%: asymptomatic course
< 10%: CMV mononucleosis
- Fever, malaise, myalgia/arthralgia, fatigue, headache
- Less common: sore throat, cervical lymphadenopathy, hepatomegaly, splenomegaly

Clinical features:

- Immunocompromised patients:
 - Asymptomatic CMV infection
 - Viral syndrome: malaise and fever with leukopenia and/or thrombocytopenia in individuals with a positive serum CMV antigen
 - CMV pneumonia: interstitial pneumonitis
 - CMV retinitis
 - CMV esophagitis and/or CMV colitis
 - CMV hepatitis: prolonged malaise and fever with mild transaminitis
 - CMV encephalitis: impaired cognitive function, neurological deficits
 - Adrenal insufficiency