Genital Herpes & Genital Warts

By

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Objectives

The students should know:

- The main structural components of HSV-2 and HPV
- Mode of transmission in HSV-2 and HPV infections
- Main clinical features of HSV-2 and HPV infections
- Diagnosis
- Treatment and prevention

Introduction

- Genital herpes and genital warts are recognized as the main sexual transmitted viral infections that might be acquired by any types of sexual contact.

Risk groups:

1- Adults who have multiple sexual partners.

2- Immune compromised individuals.

3- Infants of infected mothers.

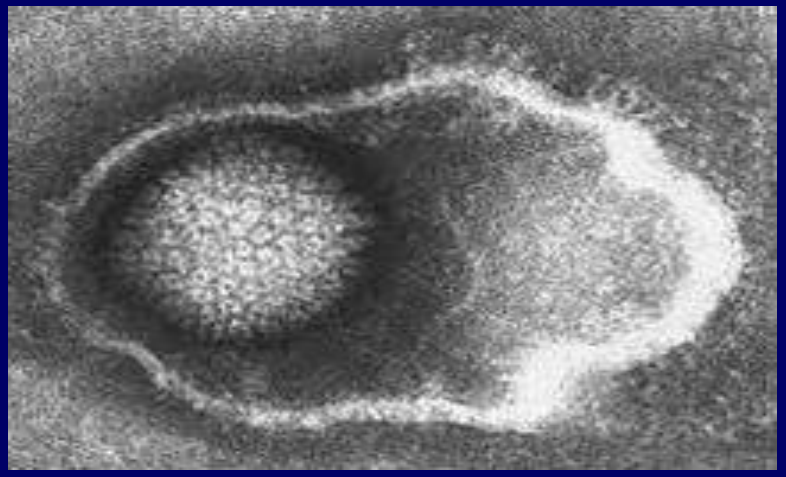
Genital herpes

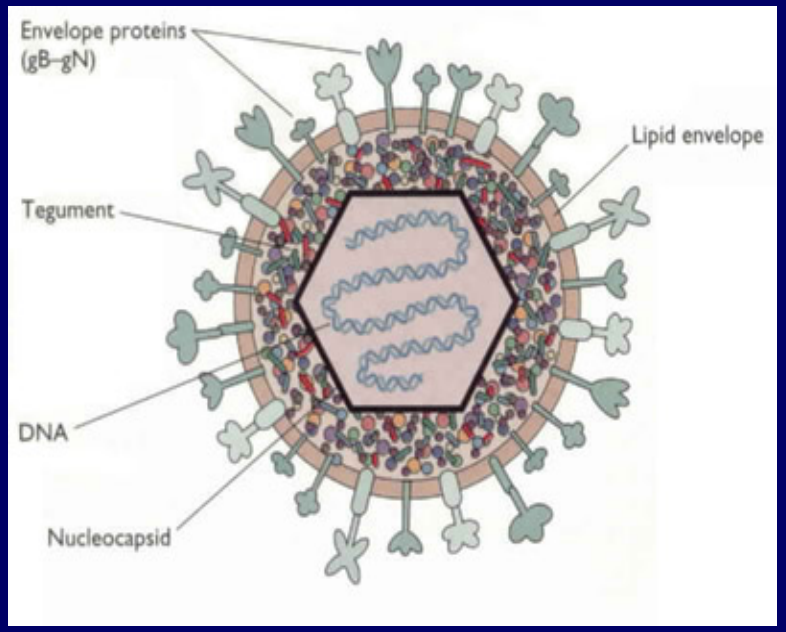
Etiology:

- There are two species of herpes virus capable of causing genital herpes:
  Herpes simplex virus type 2 (HSV-2) and Herpes simplex virus type 1 (HSV-1).
- 90% of genital herpes cases are due to HSV-2 infection, whereas 10% are due to HSV-1
- HSV-1 & HSV-2 structurally are very similar and share about 70% sequence homology.

Characteristics of Herpes virus

- Family of *herpesviridae.*
- Virion consist of:
  - Glycoprotein envelope
  - Icosahedral capsid.
  - Liner ds-DNA.



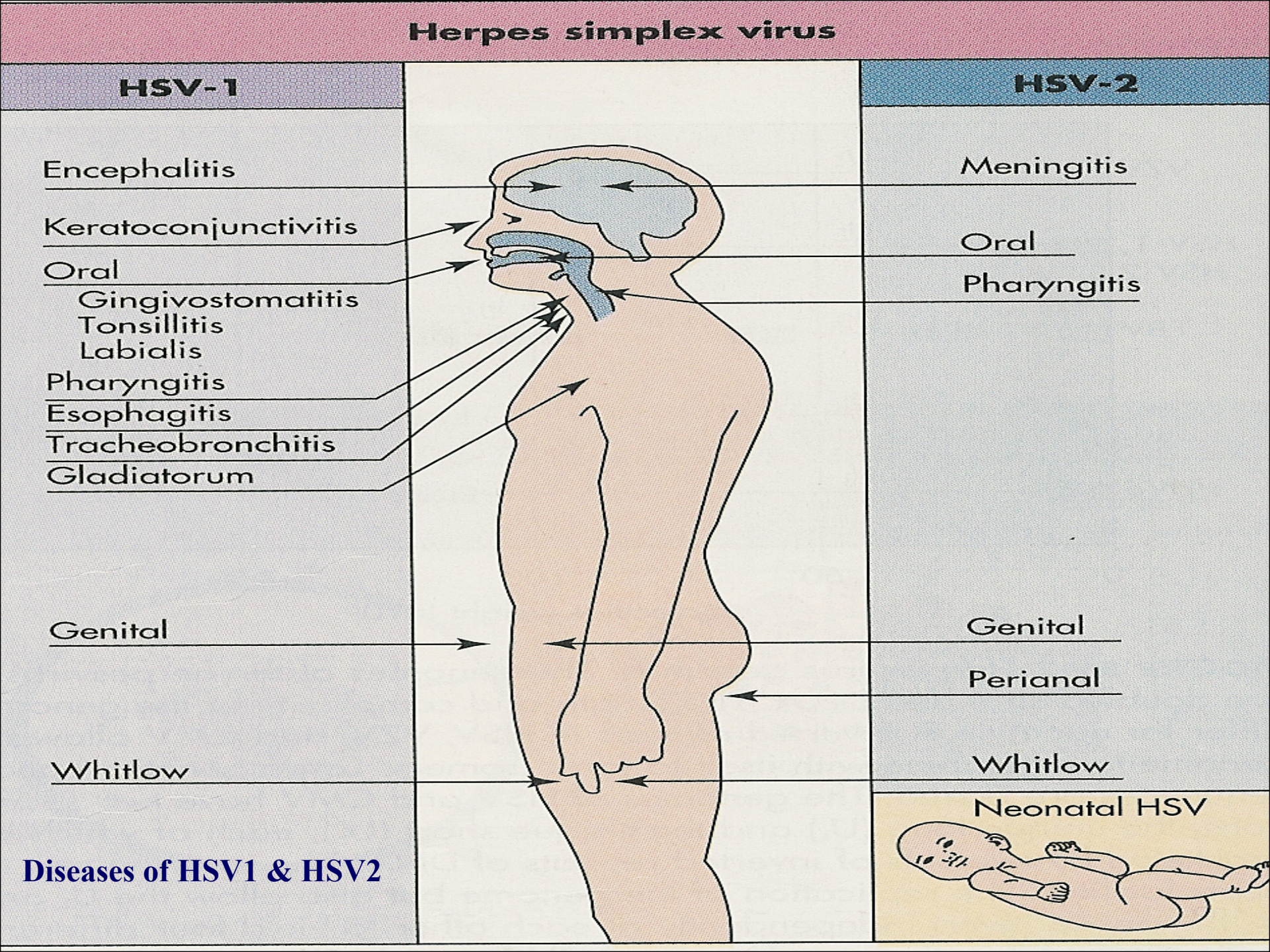


- The Herpes viruses has the ability to induce latent infection,

HSV (1&2) → **NERVE CELLS.**

HSV-1 → Trigeminal ganglia

HSV-2 → Sacral ganglia


Herpes simplex virus
HSV-1
HSV-2
Encephalitis
Keratoconjunctivitis
Oral
Gingivostomatitis
Tonsillitis
Labialis
Pharyngitis
Esophagitis
Tracheobronchitis
Gladiatorum
Genital
Whitlow
Meningitis
Oral
Pharyngitis
Genital
Perianal
Whitlow
Neonatal HSV
Diseases of HSV1 & HSV2

Transmission of Genital HSV infection

1- Sexual transmission:

- The number of different sexual partners correlates directly with acquisition of HSV-2 in both male & female.
- Homosexual men are more susceptible to HSV-2 infection.
- Genital infection can be acquired by auto-inoculation from lesions elsewhere on the body by touching vesicular fluids from any herpetic lesions (HSV-1&2).
- HSV-1 can cause genital herpes infection after oral sex, also can be seen in cases of child abuse.

Transmission of Genital HSV infection

2- Perinatal transmission (during delivery):

- The majority of maternal infection (85%) occurs during delivery, due to direct contact between the baby and infected maternal birth canal.
- The risk of perinatal transmission is about 50% if the mother has primary genital herpes, while the risk is 8% if mother has recurrent infection.
- This infection can lead to either massive herpetic skin lesions or generalized infection affecting skin and internal organs e.g. lungs, liver or brain.
- To avoid perinatal infection we do caesarean section.

Transmission of Genital HSV infection

3-Intrauterine (vertical) transmission (10%):

- Maternal primary genital HSV infection of the mother during first trimester can leads to spontaneous abortion.

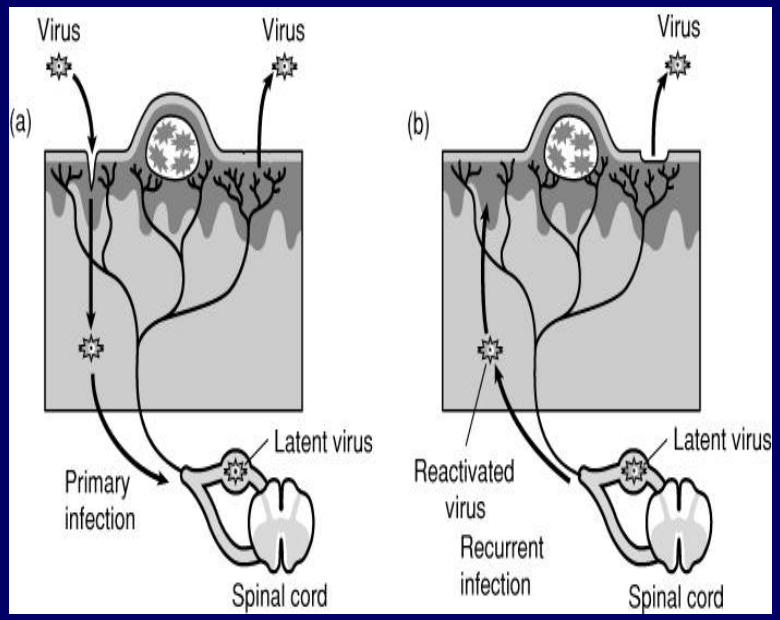
- Maternal primary genital HSV infection which develops after 20 weeks of gestations may induce malformation such as microcephaly, jaundice, hepatosplenomegally, chorioretinitis and herpetic vesicles on the skin.

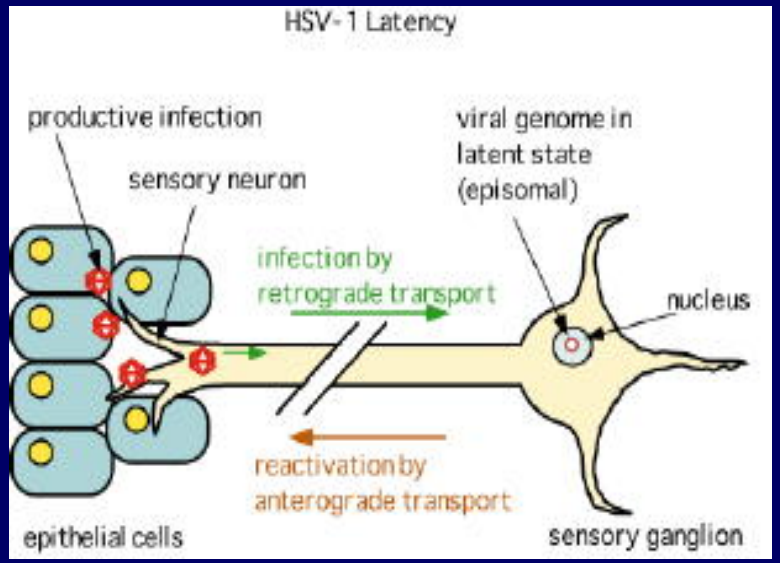
Pathogenesis of HSV-2

Genital herpes infection

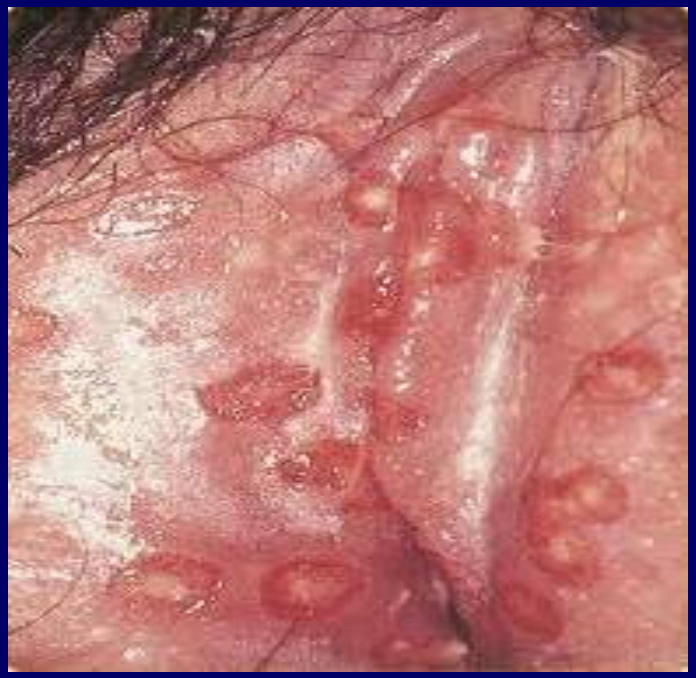
- **Primary infection** occurs when HSV-2 infects epithelial cells covering the mucosa.
- Then the virus replicates and migrates to the nearest ganglion (sacral ganglia) via neurons where it establishes latency for life.
- Once its reactivated, it travels back through neurons to the site of the primary infection and causes **recurrent infection.**

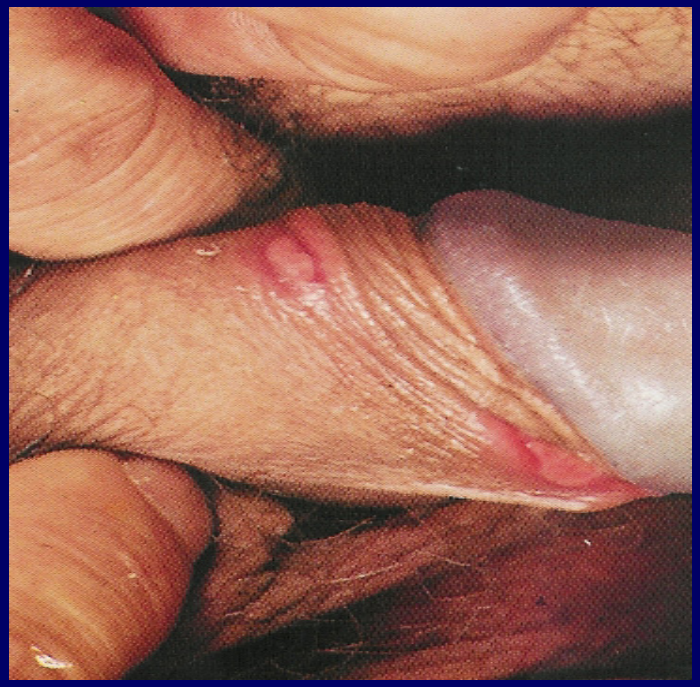
* Once the virus enters the human body, it remains for life **(latency).**





Genital herpes





Clinical features of HSV-2 infection

Primary genital infection:

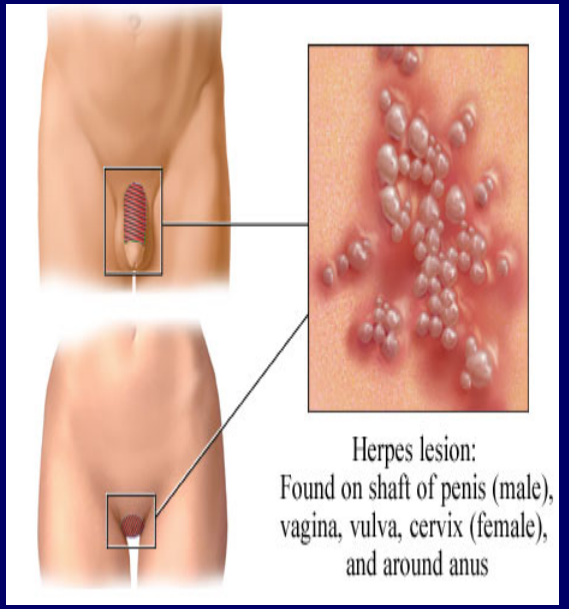
- Vary from asymptomatic to mild or sever painful episode.
- If symptoms are present (I.P. 2-12 days) they may include:

  - Fever, malaise, dysuria.

  - Inguinal lymphadenopathy.

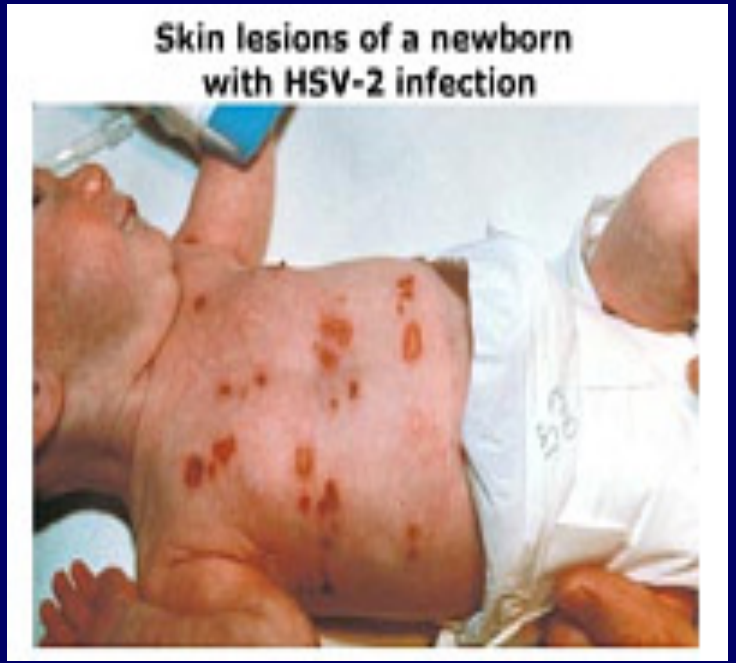
  - Vesicular herpetic lesion or ulcer localized to the cervix, vagina, vulva or perineum of the female or the shaft of the penis in the male.

- Aseptic meningitis have been observed in about 10% of cases as extra genital presentation.



Neonatal herpes infection

- Is not a common condition, but the mortality is >70% when it happens.
- It occurs during labor and delivery through the vaginal canal when a mother is having a primary active herpetic lesion and shedding the virus, also in small % as vertical transmission during pregnancy.
- It may spread to other organs such as lungs, liver, brain.



Neonatal herpes infection

It has three forms:

1- Localized skin infection.

- limited to massive skin vesicular lesions
- mild infection.

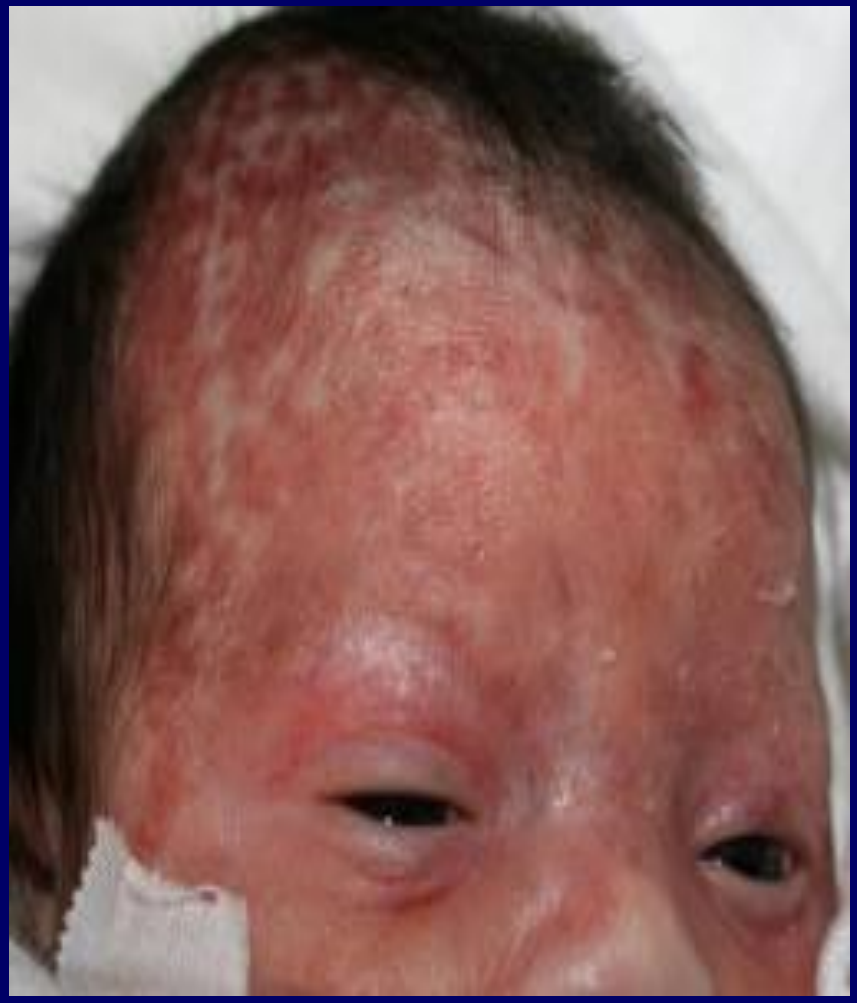
2- Localized brain infection.

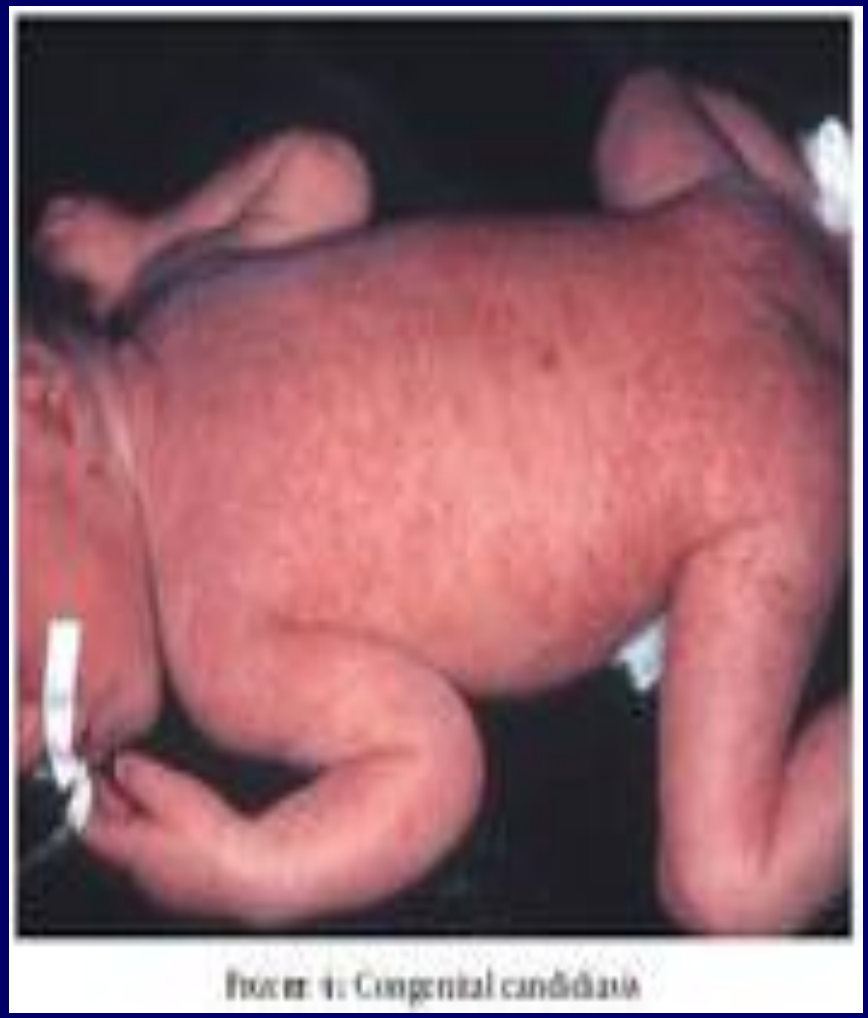
- limited to CNS invasion causing encephalitis.
- mortality is high.

3- Generalized neonatal herpes infection.

- severe massive infection of the skin (massive skin herpetic lesions) accompanied with internal organs infection including lungs (pneumonia), liver (hepatosplenomegally), and brain (encephalitis).
- usually fatal.

Neonatal herpes





Clinical picture of recurrent genital herpes.

- Occurs after reactivation by environmental or physiological factors such as stress, exposure to U.V. light, menstruation, pregnancy or any condition that decreased the immunity.
- This can be as frequent as six or more episode a year, the attacks are milder and shorter than primary episode.
- Accompanied with the appearance of herpetic vesicles on the external genitalia.
- Symptoms may include pain and itching.

Lab diagnosis

1- **ELISA:**

Serum sample is analyzed for detection the IgM Ab.

2- **Direct immunofluorescence (IF):**

Scraping of the base of the lesion sample is analyzed for detection the viral Ag.

3- **Polymerase chain reaction (PCR):**

CSF sample in case of neonatal herpes.

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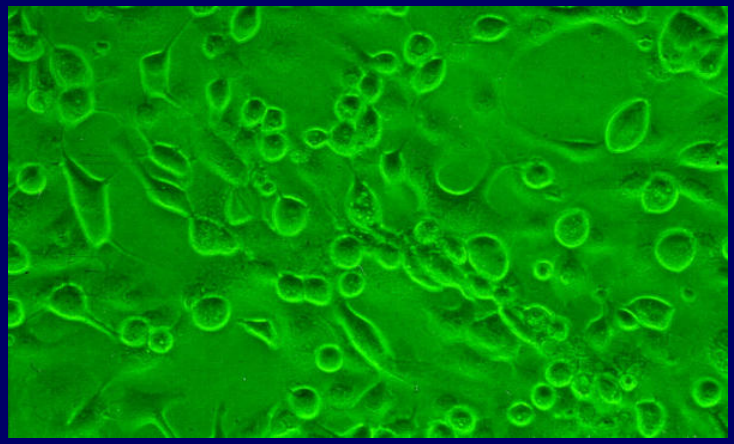
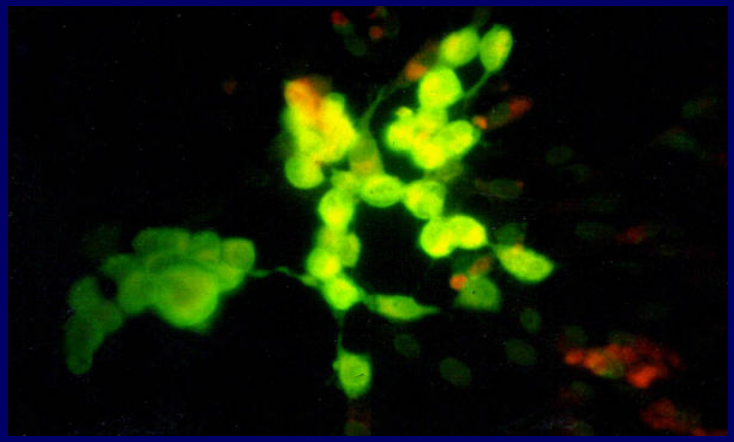
4- Tissue culture:

vesicle fluid sample is cultured in cell line (Vero or Hep-2 cells) and then identified by the following:

- Observe the viral CPE
- Direct immunofluorescence (IF)





Management

No vaccine is available to prevent HSV-2 infection, and thus the best way to control the HSV infection is by:

- Avoid sexual contact with infected individuals.
- Abstain from making prohibited relations.

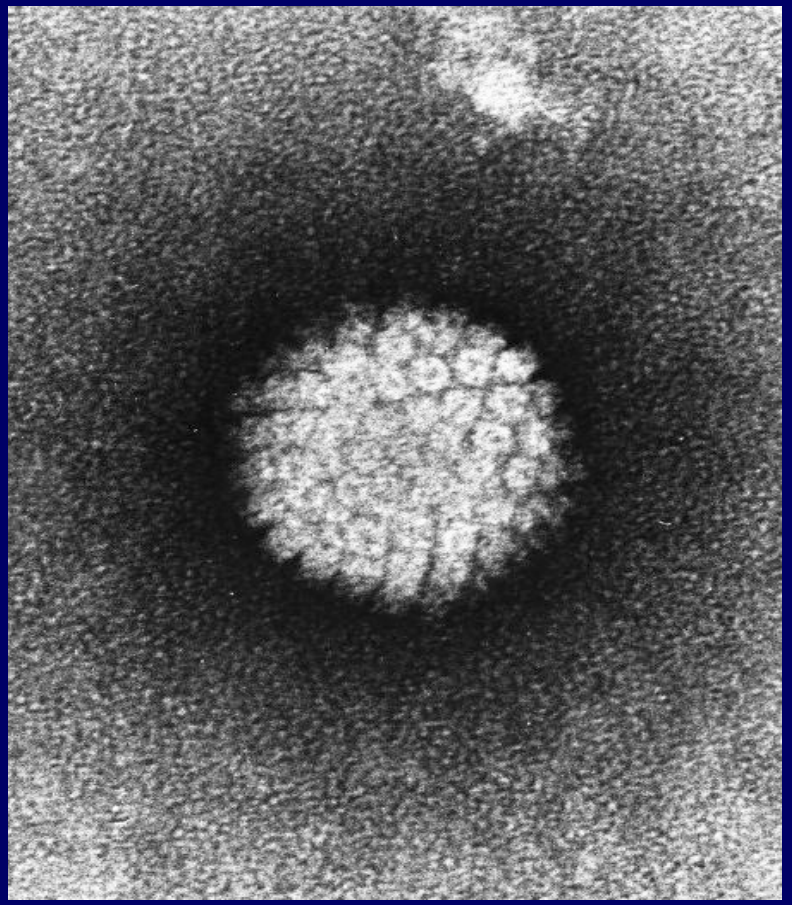
- Note: Condoms are not 100% protective against genital herpes infection.

Treatment

- Acyclovir:
  - The 1st choice therapy.
  - Suitable for pregnant women.
- Famciclovir.
- Valacyclovir.

Human Papillomavirus

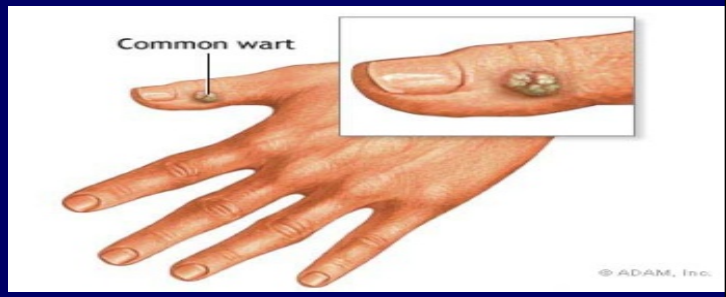
- Family of *Papillomaviridae*.
- Virion is small non-enveloped, and consist of:
  - Icosahedral capsid.
  - Circular ds-DNA.
- Does not grow in tissue culture.
- Resists detergent, heat, and can remain infectious in the environment for long time.



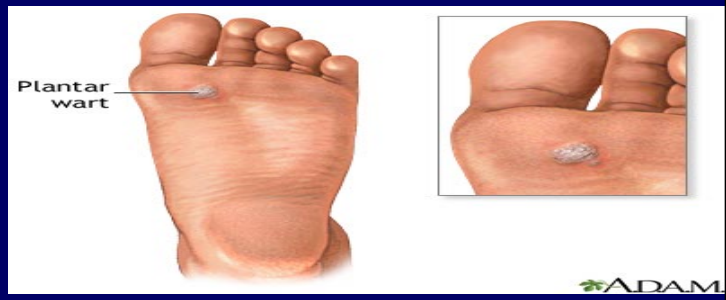
Types of warts and HPV genotype

1- Cutaneous:

- Common Warts (HPV genotype 2)

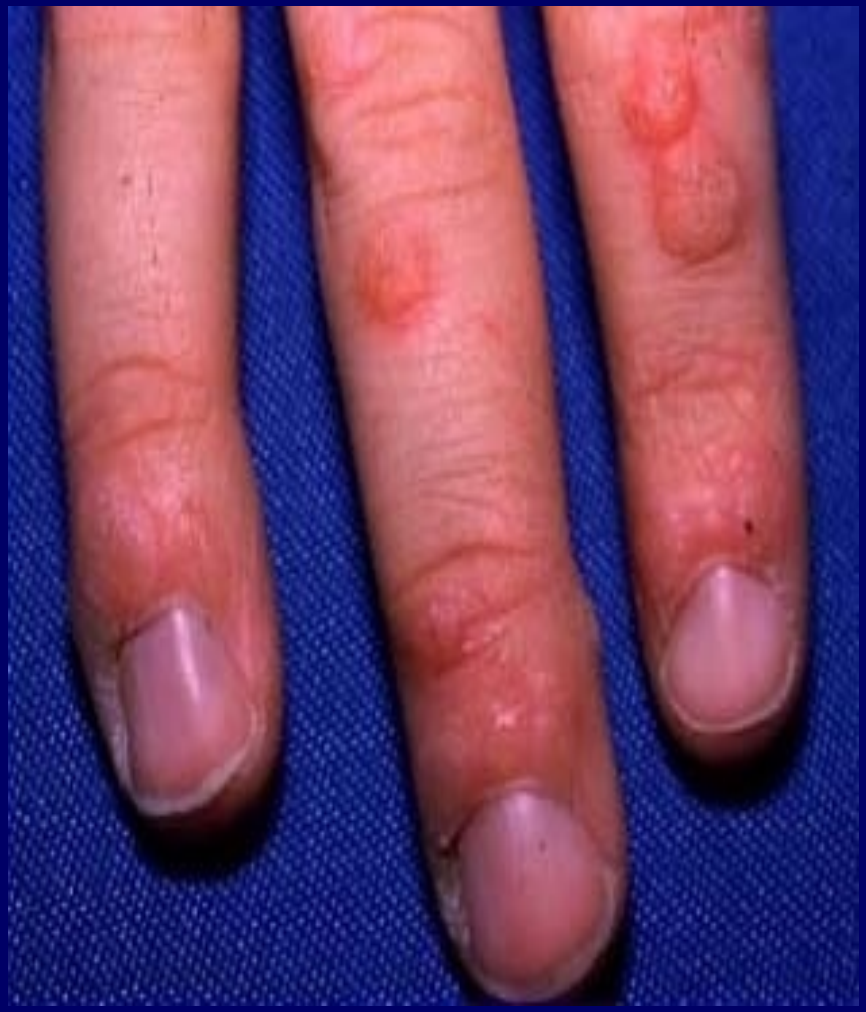


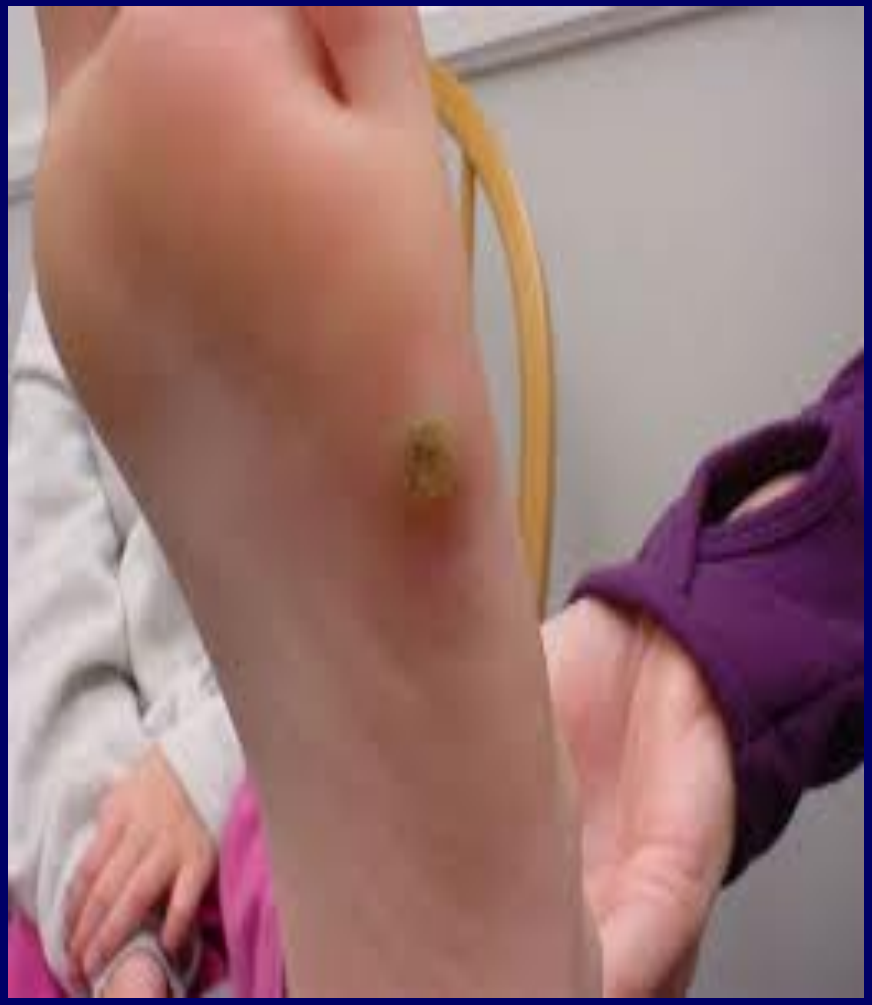
- Plantar Warts (HPV 1)



- Flat Warts (HPV 3,10)

Common warts and planter warts

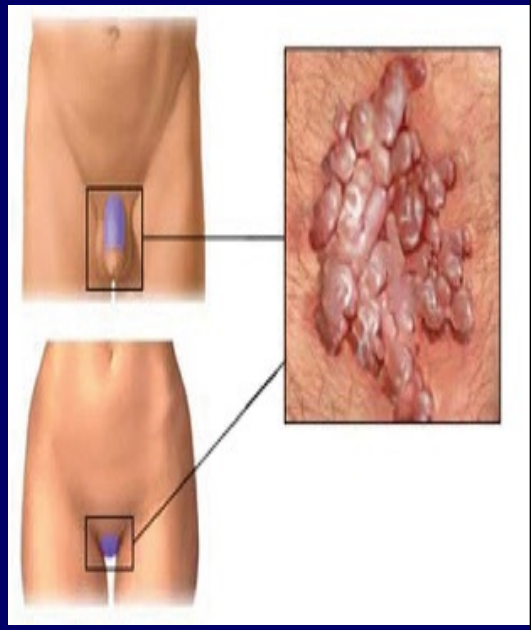


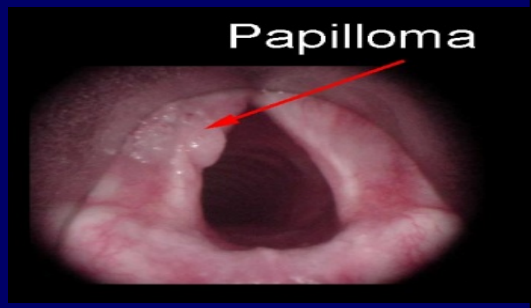


Types of warts and HPV genotype

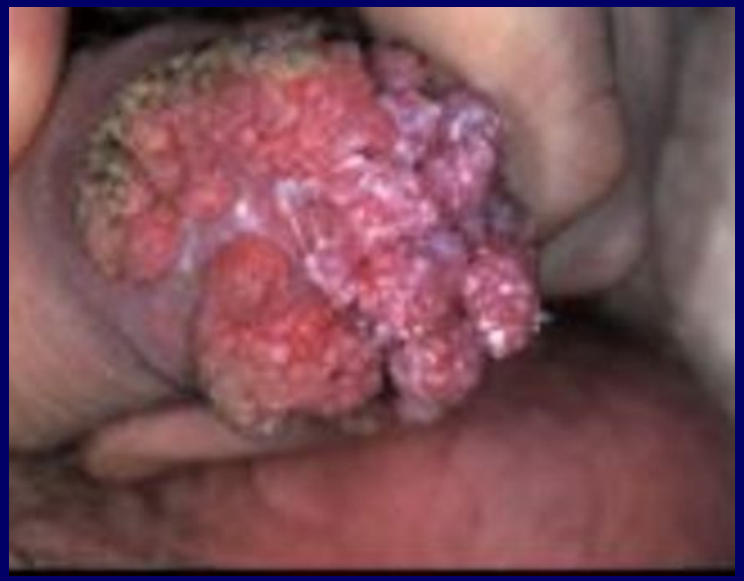
2- Anogenital or mucosal:

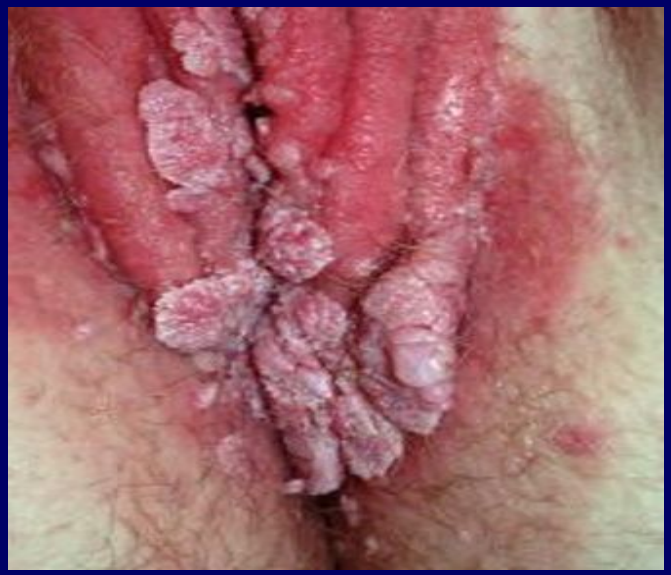
- Condyloma acuminata (benign) (HPV 6,11)
- Cervical carcinoma (HPV 16,18,31,45)
- Penile and anal carcinoma in men (HPV 16,18)
- Laryngeal Warts (benign) (HPV 6,11)





Genital warts





Route of transmission

Cutaneous Warts:

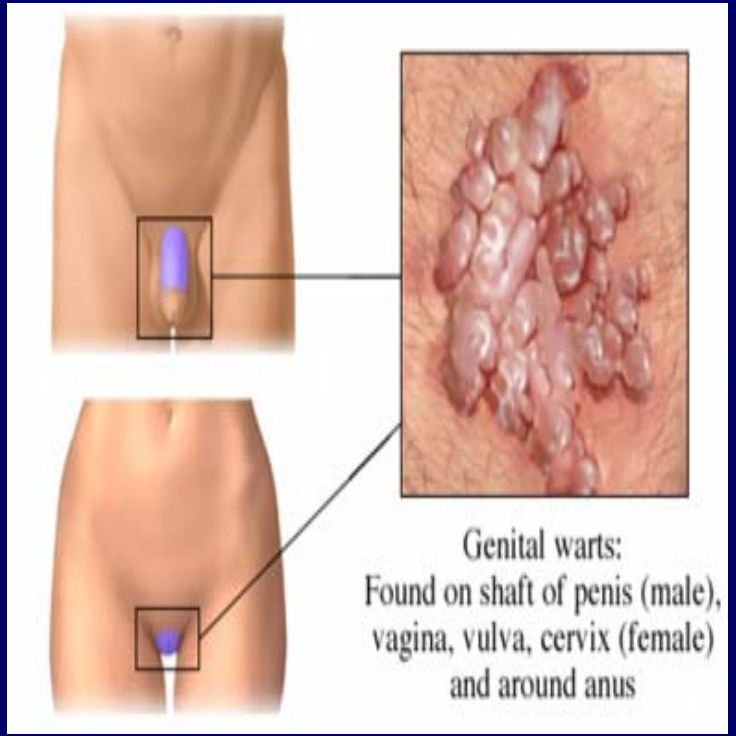
- Direct contact hand to hand (common warts) or via fomites and abrasions especially in swimming pools (plantar warts).

Anogenital or mucosal Warts:

- Transmission of genital warts mainly occurs during sexual activity and there is strong association between increasing numbers of sexual partners and prevalence of genital HPV infections. It can occur also in association with other sexual diseases as gonorrhea or chlamydial infection.
- Vertical transmission from mother to infant at birth and perinatally within the first 6 weeks of life have been demonstrated.

Clinical symptoms of genital warts

- Appear within 3-4 months after infection (I.P.).
- Warts size vary from small round to large complex mass.
- Found in the anogenital tract (inside or outside the genital and the anal areas of both males and females).
- Localized pain.
- Discomfort.
- Abnormal vaginal bleeding and discharge.



Link between HPV and cervical cancer

- Persistent HPV infection is considered the main cause of cervical cancer, HPV DNA can be detected in most grades of premalignant lesions of the female and male genital tract.
- HPV type 6 and 11 are mostly found in low-grade disease, while HPV 16 and 18 are more commonly associated with lesions of greater severity and invasive cancer.

- > 90% of positive Pap-smear is due to HPV infection.

Pap-smear: is a screening test for detection abnormal epithelial cells of the cervix.

Diagnosis

- External genital warts can be easily diagnosed by medical examination.
- Internal genital warts can be visualized by colposcopy.

Lab diagnosis:

1- Polymerase chain reaction (PCR) is used to detect HPV DNA.

2- In-situ DNA hybridization is used for HPV genotyping.

3- Pap-smear test is used to identify abnormal epithelial cells of the cervix (cervical dysplasia).

HPV treatment

1- Topical treatment:

- Applied directly on external warts.
- Used for several weeks.
- Examples: Imiquimod, Podofilox.
- Podophyllin is applied by a doctor, but it is contraindicated in pregnancy.
- Trichloroacetic acid (T.C.A) is safe during pregnancy.

2- Injection treatment:

- Interferon alpha, 5-flurouracil epinephrine gel.
- Could be taken for several weeks (8-12).

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3- Cryotherapy:

- freezing warts by liquid nitrogen

4- Electrocautery treatment:

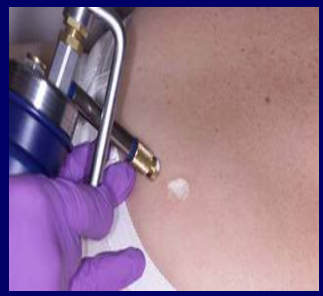
- destroying warts by an electric current

5- Laser therapy:

- destroying warts by a focused light beam

6- Surgical excision:

- removing warts by surgical tools.



HPV prevention

There are two vaccines available Gardasil and Cervarix and both are:

- Recombinant viral-like particles with no DNA.
- Given in 3 doses at 0, 2, 6 months.
- Recommended for young individuals ages 9-26 yrs old.
- Not given to pregnant women.

- **Gardasil**, a quadrivalent vaccine, provides protection against HPV genotypes 6,11,16,18 which causes genital warts and cervical cancer.
- **Cervarix**, a divalent vaccine, provides protection against HPV genotypes 16 and 18 which causes cervical cancer.

Thank you for your attention !