Polyomavirus (IC) — Naked

* Circular dsDNA -(5-5.1 Kb)
* The capsid contain 3 structural protein 1,2,3 and contain 72 capsomer

Transmission: respiratory inhalation – or exposed to blood, urine or oral secretion.

Pathogenesis: Replicate in upper respiratory Tract mainly (tonsillar tissue) & S.T in B cells and cause systemic infection then reach finally the kidney cells (latency).

* The receptors for these viruses are (α2,6 sialic acid Receptor)

Manifestation: Usually in asymptomatic in primary infections and mild symptoms related to systemic and respiratory manifestation

JCV / BKV

Testing of JCV and BKV:
1. Histopathology Changes
2. Hybridisation of DNA molecule.
3. Antigen detection
4. MRI, PML

Progressive multifocal leukoencephalopathy
Reactivation and demyelination of the white matter of the brain
symptoms:
1. motor dysfunction
2. visual problems
3. communicative impairment
4. hemiparesis
5. progressive dementia.

(UTIs). The virus is reactivated in immunocompromised people
manifestation: Nephropathy can lead to kidney failure
- Ureteral stenosis
- cystitis which hemorrhagic or non hemorrhagic.

Siamian Virus

no associated with disease.

Merkel Cell Polyomavirus:

* Oncovirus → causes markel cell carcinoma specially affect those who have fair skin, elderly people and immunocompromised people
* occur mainly in the head & neck.

Diagnosis: PCR, T antigen detection.

Treatment: Surgery, radiotherapy and chemotherapy.

Poxvirus — Enveloped

* dsDNA ((The largest DNA virus in the world))

The only DNA virus replicate in the cytoplasm.

Capsid ⇒ Complex capsid

Smallpox (Variola)

only found in 2 places in the world (CDC labs in Atlanta Georgia and in a lab in Siberia)

* Cause fatal disease
* The first and the only infectious disease eradicated.
* first (live-attenuated vaccine)
* Smallpox is a potential bioterrorism agent

factors that led to successful eradication of small pox (important)
* Single antigenic type
* No asymptomatic class
* No animal reservoir
* The presence of an effective vaccine
* disease severity & psychological effect.

There are 2 type of small pox
1) virola major : mortality rate 30%
2) virola minor : milder form and mortality rate dose not exceed 1%.

pathogenesis:
Infection of mucosal cells in upper respiratory tract → regional lymph nodes → Blood (viremia) → spreads throughout the body → return to the blood → intense viremia → skin epithelial cell → spread centripetally.

Clinical features:
Rash (macule → papule → vesicles → pustules → permanent bookmarks → scars (life long disfigurement)

Cowpox

Mullosucm contagiosum

clinical manifestation:
- self limited - spontaneous resolution after a couple of months.
* Papule that umbilicated appeare anywhere on the body.
* لها ابتعاج من الوسط تشبه الصرة.

Can be treated by cidofovir but it does not need. (self limited)

Papillomavirus (IC) (HPV) — Naked

The major cause of wart.

* Double stranded circular DNA

Family
Papillomaviridae → divided into 16 genera
↓
Genus
α - papillomavirus
↓
Species
Human papillomavirus

- Species → share 60-70% identity
- Type → share 71-89% identity
- Subtype → share 90-98% identity
- Variant → 98% identity

HPV
Gene product: 8 Eearly, 2 Late genes
$E_6 + E_7$ → oncogene
E_2 → repress the activity $E_6 + E_7$

Pathogenesis → Infect:
* Epithelial cells (cutaneous) of the skin (face, hands and feet)
* Epithelial cells of the mucous membranes especially respiratory tract (pharynx, nasal oral cavities) and anal and genital region

→ enters through microbrasion to basal cells

HPV is the most common cause of sexual transmission followed by infection of cervical epithelial basal cells.

Type of HPV: في انواع كثيرة ارجعوا للسلايدات وشوفوهم.
- common 2/4/26/27/29/57
- low risk 6/11/40/42/43/44/54/61/70/72/81
- high risk 18/16/31/33/35/39/45/51/52/56/58/59,68,73, 82

clinical manifestation

* Skin warts (hand and nail) Painless, dome shaped projection (skin with a rough appearance).
* planter warts (feet) painful and scaly
* Flat warts (face & extremities) - pediatric pop often painless, small, smooth, flat tapped but numerous
* Filiform warts (eyelids and lips). long projection (finger like)
* In rare condition (epidermodysplasia verruciformis) start as flat wart and trans-orm to cancer skin.
* respiratory papillomatosis (infection in the upper respiratory tract) lead to voice changes & high pitched breath sound.
* Condylomata acuminata: Anal and genital infection (Painless, itching, burning, local pain, bleeding) associated with penile, cervical and uterus cancer.

Diagnosis
1) PAP smear
2) PCR
3) Appearance of lesions
4) Histopathologic examination
5) IHC stains for certain high risk types.

Treatment: No curable treatment
If the infection creates episomes we can managed by: surgical removal, liquid nitrogen, laser vaporization or chemical agent (podophylin toxin)

Prevention
Vaccine 1 against (6, 11 low, 16, 18 high risk)
Vaccine 2 against (16, 18

Epidemology
- Most common STI
- Main cause of cervical and uteral cancer.
- increase risk of oropharyngeal cancer.

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