VIRAL INFECTIONS
DERMATOLOGY

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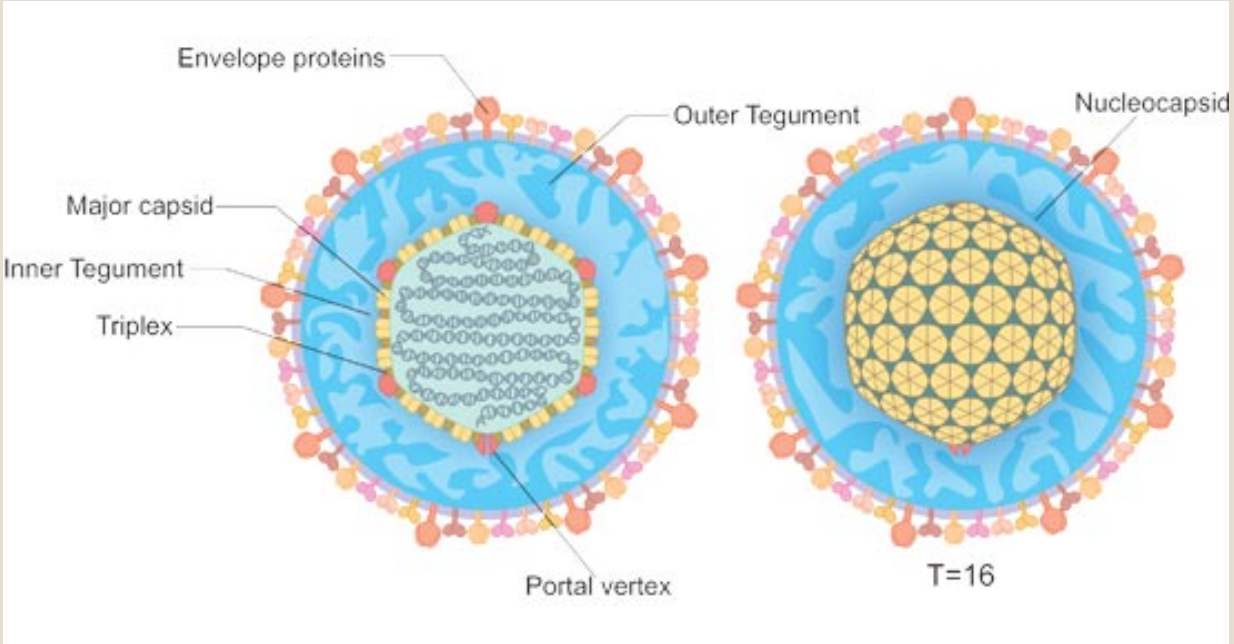
Intro

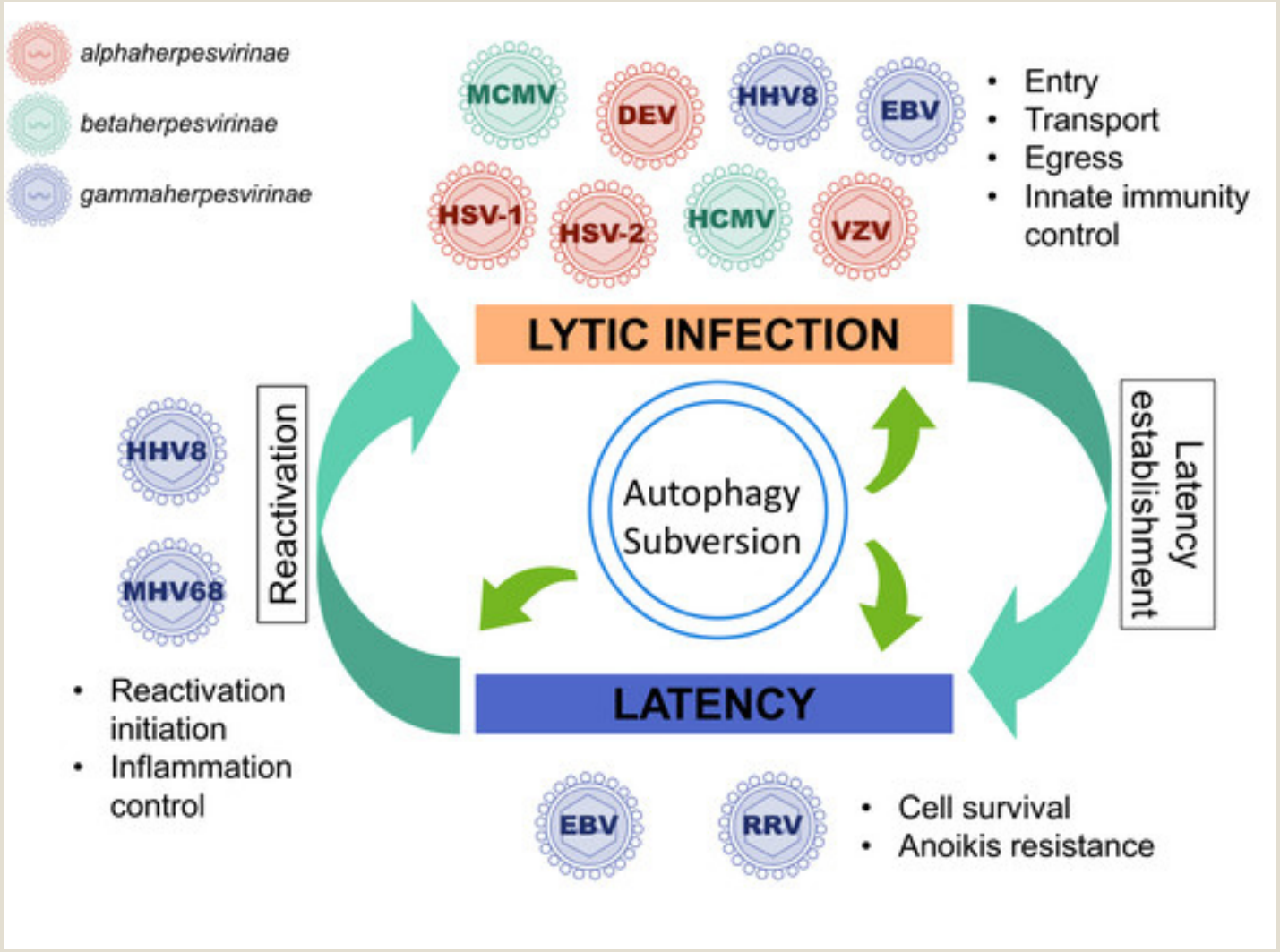
- The term Virus comes from the Latin word Toxin and its heavily debated whether viruses should be considered micro-organisms or toxins since they have no cell structures of their own and need host cells to replicate.
- Viruses are continuously ever-changing, either gradually acquiring minor mutations (**Drift**) or suddenly following major recombination of their genome (**Shift**).
- They are generally divided into:
  1. RNA viruses: Unstable undergoing immense drift and shift usually causing systemic disease
  2. DNA viruses: More stable, undergoing inoculation directly into the skin and replicate in epidermal cells

Herpes Virus

- Herpesviridae is the name of a family of enveloped, double-stranded DNA viruses with relatively large complex genomes, also known as herpesviruses.
- Many types;
  - Herpes Simplex
  - Varicella Zoster

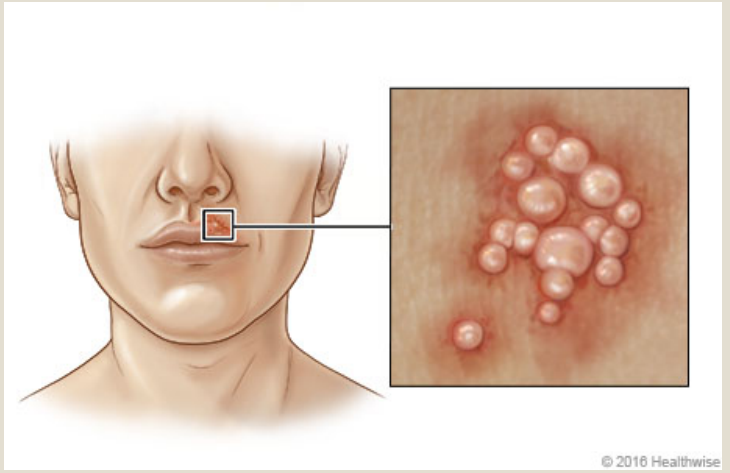


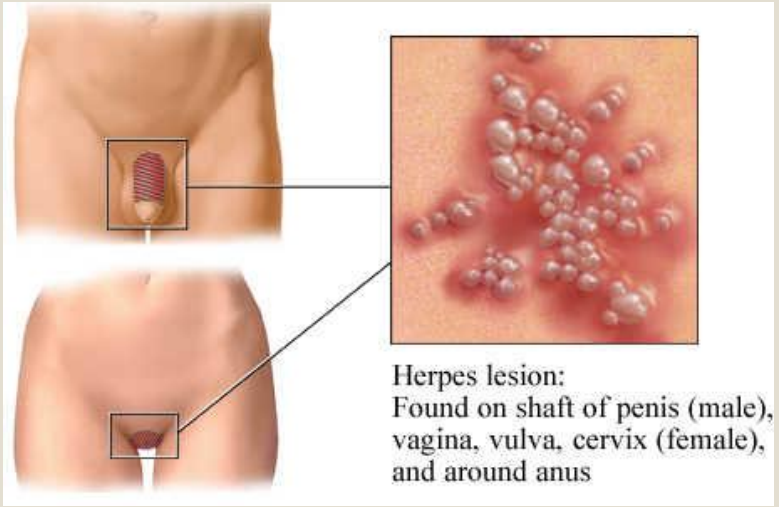
HSV remains within the host for life, remaining latent in the sensory nerve ganglia, leading to recurrent activation



Herpes Simplex

- HSV is spread by **direct contact** – 'shedding' from one host to another.
- Two viral subtypes exist:
- type I is associated mainly with **facial** lesions, although the fingers and genitals may be affected.
- Type II is associated almost entirely with **genital** infections.





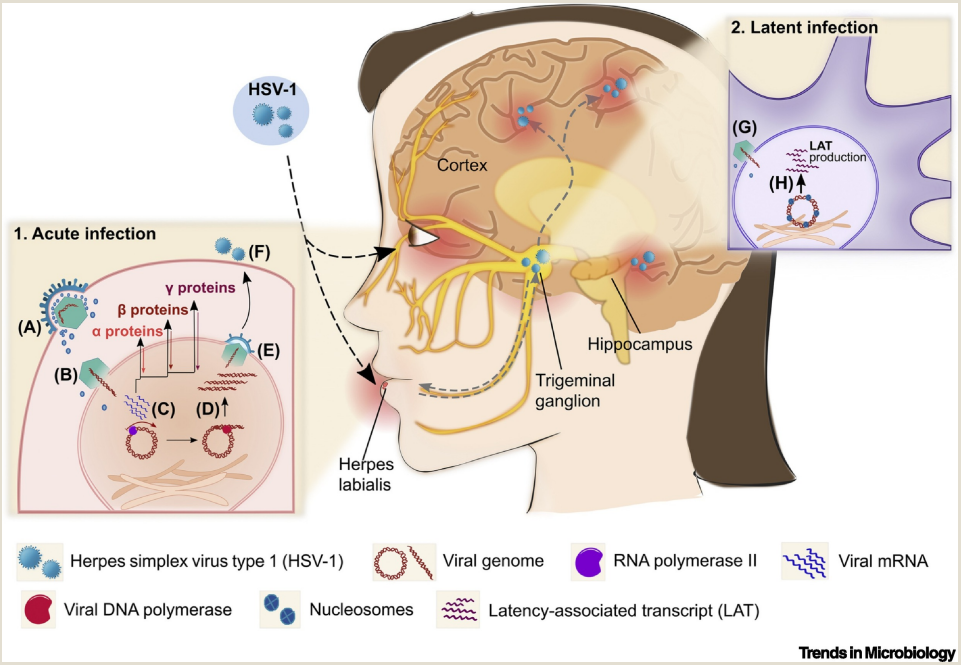
Herpes Simplex 1

- Worldwide, an estimated 66 percent of the population has (HSV-1) infection.
- Transmitted from **person to person** via infected oral secretions during close contact
- Usually occurs in or **around the mouth/ nose**, with variable involvement of the face.
- Lesions consist of **small vesicles** which crust over and are associated with regional lymphadenopathy.

Perioral lesions ("cold sores")

Figure 14.2 Herpes 'cold sore'.

- Episodes of reactivation of HSV may be triggered by the cold (‘cold sore’), bright sunlight, trauma, immunosuppression or intercurrent illnesses.
- There is frequently a prodrome of tingling or itching before the appearance of the vesicles, which occur in the distribution of a sensory nerve.
- Recurrent HSV-1 infections of the lips and perioral area are estimated to occur in 20 to 40 percent of the infected population.



Herpetic whitlow

- HSV infection of the finger, known as herpetic whitlow, can occur by inoculation of the virus through a break in the skin barrier.
- Untreated, these infections gradually heal over two to three weeks, but similar to oral HSV-1 infection, they can recur.
- Herpetic whitlow is often misdiagnosed as a bacterial infection. The distinction is important, since **antibiotics and drainage are not necessary**.
- In children, herpetic whitlow can occur at the time of primary oral infection through autoinoculation. Occupational hazard among dental workers and others whose hands are exposed to infected oral secretions.

Herpetic whitlow

Grouped vesicles on an intensely erythematous base are characteristic of herpes simplex infection. The lesion is usually monolateral and is more often painful than pruritic.

Herpes Simplex 2

- **sexually transmitted infection that causes genital herpes (an STD).**
- HSV type II infects the external genitalia; the initial vesicle or vesicles rapidly break down into painful ulcers.
- Genital vesicles may not be visualized as they rapidly ulcerate.
- Genital herpes in pregnancy carries a risk of **ophthalmic infection of the infant**. Caesarean section may be indicated.

Management:

- Various strategies may be employed in the management of patients with reactivation disease. These include:

  - Topical aciclovir/penciclovir/idoxuridine cream can be used to treat mild labial herpes.
  - Severe infections should be treated with oral acyclovir
  - Secondary prophylaxis (suppressive therapy) for frequent reactivation can be given

Genital HSV in HIV Patients

Brisk inflammatory responses to genital HSV can be seen in patients with HIV whose immune system is reconstituting once they start their HAART (highly active antiretroviral therapy) – the so called *immune reconstitution inflammatory syndrome* (IRIS).

Clinically, this is seen as deteriorating signs and symptoms of HSV disease and may look like a hyperkeratotic nodule (pseudoepithelial hyperplasia) and may warrant aggressive treatment of the HSV with oral high–dose valaciclovir (with additional imiquimod 5% cream) and occasionally a reduction in the HAART medication.

Varicella Zoster Virus

- VZV is a herpes virus that causes chicken pox (the primary illness), which is characterized by a prodromal illness for about 2 days followed by crops of papular-vesicular lesions that eventually crust over and heal.
- Subsequently shingles (reactivation) may occur as the virus remains latent in the sensory nerve ganglia. The thoracic nerves are most commonly affected.

Figure 14.5 Varicella zoster virus chicken pox infection in an adult.

- In shingles, pain, fever and malaise may precede the rash which is characterized usually by its **dermatomal** distribution.
- Erythematous papules usually precede vesicles which develop over several days, crusting as they resolve, often with secondary bacterial colonization.

- Trigeminal shingles may affect:

➢the ophthalmic nerve (causing severe conjunctivitis).

➢the maxillary nerve (causing vesicles on the uvula or tonsils).

➢the mandibular nerve (causing vesicles on the floor of the mouth and on the tongue).

• Shingles affecting the facial nerve presents with lesions in the external auditory canal (Ramsay Hunt syndrome).

Management

- Patients ideally should receive **high-dose aciclovir** for 7 days within 72 hrs of the onset of the eruption.
- If the eye is affected or there is nerve compression, then intravenous aciclovir should be considered and patients may require systemic steroids to prevent nerve paralysis in severe cases.
- **Greasy emollient** should be applied to the affected skin regularly to prevent cracking and reduce pain as lesions heal.
- Occasionally, peripheral motor neuropathy can result and a proportion of patients develop severe chronic **post-herpetic neuralgia**. Rx by **gabapentin or carbamazepine.**

Pityriasis rosea (PR)

- Pityriasis rosea (PR) has been thought recently to be triggered by an upper respiratory tract infection with human herpes virus type 6 or 7.
- PR classically presents with an initial single annular erythematous patch with a collarette of scale – the **herald patch**.
  - The rest of the rash consists of multiple smaller scaly patches on the trunk, upper arms and thighs (**old-fashioned bathing suit distribution**).
  - On the back, the lesions may follow the angle of the ribs in a '**Christmas tree pattern**'.
  - The rash **settles spontaneously** over about 4–6 weeks, but a mild topical steroid and emollient can be given if the rash is pruritic or inflammatory.

Poxviruses

- Pox viruses are large DNA viruses, with a predilection for the epidermis.
- Variola (smallpox), once a disease with high mortality, has been eliminated (last reported case of smallpox occurred in Somalia in 1977).
- Molluscum Contagiosum and Orf are also pox viruses.

Molluscum Contagiosum

- Caused by Molluscum Contagiosum virus.
- The commonest poxvirus skin infection is usually acquired in **childhood**. It is highly contagious and is spread by direct contact often within families or schools.
- The incubation period is variable between 14 days and 6 months.
- Flesh-coloured, umbilicated papules are characteristic. Large solitary lesions (giant molluscus) and infected lesions may look atypical.
- Resolving lesions may be surrounded by a small patch of inflammation.

Orf

- Orf is usually recognized in rural areas. It is seen mainly in early spring as a result of **contact with infected lambs**.
- A single papule or group of lesions develops on the **fingers** or hands with purple papules developing into bullae. These rupture to leave annular lesions 1–3 cm in diameter with a necrotic centre and surrounding inflammation.
- The incubation period is a few days and the lesions last 2–3 weeks.

Management

➢Molluscum Contagiosum:

- Most lesions will **resolve spontaneously**, leaving no marks on the skin. Therefore, painful and scarring treatments should be avoided if possible.
- Topical hydrogen peroxide (Crystacide) and **cryotherapy** can be used to cause local inflammation and speed up resolution in non-cosmetically vulnerable sites.

➢Orf:

- In immunocompetent patients, **treatment is not necessary** since the infection spontaneously resolves within several weeks. Topical antiseptics can be used to minimize risk for secondary bacterial infections.
- Reports describe successful treatment with **cryotherapy**, electrocautery and curettage.

Wart Viruses

- More than 100 different subtypes of HPV have currently been identified. HPV subtypes 6 and 11 are responsible for the majority of genital warts and subtypes 16/18 with the development of cervical/anal/vulval/vaginal/oral carcinomas.

- Warts are classified as:
  1. ano–genital/mucosal
  2. non–genital cutaneous
  3. Epidermodysplasia verruciformis (EV)

Epidermodysplasia verruciformis (EV)
a.k.a Tree man syndrome

Mucosal warts

Wart Viruses

- HPV only infects humans and is spread by direct contact, usually through a small break in the skin/mucous membrane. Viral warts can have a varied clinical appearance from filiform to hyperkeratotic periungual.
- HPV can remain viable in the environment at low temperatures for prolonged periods and therefore be contracted from contact with inanimate objects (changing room floors).
- The basal keratinocytes become infected, causing epidermal hyperplasia seen clinically as an exophytic warty lesion. Plantar warts (verruca) form painful plaques (mosaic) containing black ‘dots’ that represent thrombosed capillaries.

Filiform HPV wart.

Periungual hyperkeratotic HPV warts.

Plantar warts (verrucas).

Wart Viruses

Cutaneous HPV lesions can undergo malignant transformation, particularly in individuals who are immunosuppressed by HIV or medication. If skin lesions suddenly increase in size or are painful, then transformation to squamous cell carcinoma should be suspected. Acitretin is given to some transplant recipients to try to reduce the rate of cutaneous malignant transformation.

Viral Diseases with Rashes

- Measles
- Rubella
- Infectious mononucleosis
- Erythema infectiosum
- Roseola infantum
- Gianotti–Crosti syndrome
- Hand, foot, and mouth disease (Coxsackievirus A16 and Enterovirus 71)
- Primary HIV infection

Measles

- Measles usually affects children under the age of five years and is highly contagious. The incubation period is 7–14 days. Initially, Koplik's spots (white spots with surrounding erythema) appear on the oral mucosa and then within two days a macular rash appears, initially behind the ears and on the face and trunk, and then on the limbs. Papules form and combine and may be haemorrhagic or vesicular, which fade to leave brown patches. No specific treatment.

Koplick's spots in measles.

Rubella

- The incubation period is 14–21 days. First signs of the disease include erythema of the soft palate and lymphadenopathy. Later, pink macules appear on the face, spreading to trunk and limbs over one to two days. The rash clears over one to two days (occasionally no rash develops). Infection during pregnancy can cause congenital defects. Prevention through immunisation of school–aged girls is highly effective.

Erythema infectiosum

- Erythema infectiosum (fifth disease) is caused by parvovirus B19, which mainly affects children aged 2–10 years. The incubation period is 5–20 days. The disease manifests as a prodrome of mild fever before the onset of a hot erythematous eruption on the cheeks – hence the ‘slapped cheek syndrome’. Over two to four days a maculopapular eruption develops on the limbs and trunk, which can extend to the hands, feet and mucous membranes, and then fades over one to two weeks.

Hand, foot, and mouth disease

- Hand, foot, and mouth disease (HFMD), as the name suggests, is an infection causing lesions on the hands/feet and in the mouth. It is most commonly associated with Coxsackievirus A16 and Enterovirus 71 (the later can be associated with severe illness, flaccid paralysis) and affects mainly children. The virus is highly contagious with a short incubation period of three to six days. Young children in particular present with fever, headache, and malaise alongside the rash. The characteristic rash consists of intense erythema surrounding yellow–grey vesicles 1–1.5 mm in diameter on palms/soles and lips. Treatment is supportive care. The rash and symptoms usually settle rapidly over four to six days

THANK YOU

Resources:

- ABC of Dermatology.
- UpToDate.