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Dermatology Review for PGMEE

HIGHLIGHTS

- Comprehensive and updated review of dermatology.
- Image-based questions and charts.
- Covered high yielding areas which may be asked in future exams.
- Facts and concepts from latest editions of Rook's Textbook of Dermatology, IADVL Textbook, Fitzpatrick's Dermatology in General Medicine.
- Prepared by academic dermatologists
- AIPGMEE, AIIMS (Uptill May 2016), PGI, DNB, state entrance 2005-2016 covered.



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CHAPTER

3

Viral Infections

Questions

1. **Which disease is caused by Herpes viridae?**
   a. Variola
   b. Vaccinia
   c. Orf
   d. Roseola infantum
2. **Which viral exanthem shows Herman's spot on tonsils?**
   a. Scarlet fever
   b. Measles
   c. Rubella
   d. Erythema infectiosum
3. **Which is the largest DNA virus that causes skin infection?**
   a. Poxviridae
   b. Togaviridae
   c. Parvoviridae
   d. Paramyxoviridae
4. **Which is the most common virus causing Gianotti-Crosti syndrome?**
   a. Epstein-Barr virus
   b. Parvovirus
   c. Cytomegalovirus
   d. HIV
5. **Which is the commonest cause of Kaposi's varicelliform eruption?**
   a. HSV type-1
   b. Coxsackie A16
   c. Vaccinia
   d. Varicella
6. **Which virus is associated with all types of Kaposi's sarcoma?**
   a. Coxsackie A16
   b. Hepatitis C
   c. Herpes virus-8
   d. HSV-1
7. **What is isotopic response?**
   a. Development of similar lesions of the site of trauma
   b. Disappearance of skin disease following skin trauma
   c. Unusual development of inflammatory lesions within the affected dermatome following herpes zoster
   d. None of the above
8. **All viral infections produce congenital deformities except:**
   a. Varicella infection
   b. Rubella
   c. Cytomegalovirus infection
   d. Epstein-Barr virus infection
9. **Which viral infections produce 'blue berry muffin baby?**
   a. Cytomegalovirus infection
   b. Rubella
   c. Exanthem subitum
   d. None of the above

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10. Which is the most commonly involved dermatome in herpes zoster?
a. Lumbosacral
b. Cervical
c. Trigeminal
d. Thoracic

11. Which viral hemorrhagic fever produces melasma-like and freckle-like pigmentation?
a. Dengue
b. Ebola
c. Chikungunya
d. HHV 6, 7

12. Koilocytes are seen in:
a. Molluscum contagiosum
b. Verruca vulgaris
c. Cytomegalovirus infection
d. Kawasaki disease

13. Human papilloma virus (HPV-2) is the major causative agent in:
a. Verruca vulgaris
b. Plane wart
c. Anogenital wart
d. Respiratory papillomatosis

14. Which are the high-risk HPVs?
a. 6, 11
b. 16, 18
c. 3, 10
d. 1, 2

15. Which type of HPV is mainly seen in Epidermodysplasia verruciformis-associated malignancies?
a. HPV 1, 2
b. HPV 6, 11
c. HPV 16, 18
d. HPV 5, 8

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Answers and Explanations

1. Ans. (d) Roseola infantum *(Ref: Rook's Textbook of Dermatology, 8/e p33.2)*

a, b & c are caused by poxviruses. Pox viridae are the largest of DNA viruses causing skin infection. Variola (smallpox) is now eliminated from the world. Last case reported in 1977 was from Somalia.

Vaccinia: Vaccinia does not occur naturally, postulated to have arisen as a mutant from cowpox. Antigenically it is closely related to variola and is invaluable for vaccination against smallpox. **Cowpox is an infection of cattle by orthopoxvirus.**

Orf (ecthyma contagiosum) is caused by parapox virus. Humans acquire infection from sheep and goats. Spontaneous recovery within 3–6 weeks. Another **parapox infection is milker's nodule (pseudocowpox), which occurs on the teats of cow.**

Roseola infantum (exanthem subitum)

The most common exanthematous fever under 2 years of age. It is caused by **HHV-6, and HHV-7**. When fever subsides, maculopapular rash appears. Rash subsides after 2 days.

2. Ans. (b) Measles *(Ref: IADVL Textbook of Dermatology, 4/e p625)*

Scarlet fever is caused by streptococcus pyogens. After an episode of pharyngitis, patients develop erythematous papules **(sandpaper-like)** on trunk and extremities. A linear petechial eruption **(pastia's lines**) occurs in flexural areas. **White strawberry tongue** (white coating on tongue with hypertrophied papillae) seen.

Measles are caused by paramyxovirus. Rash appears initially behind ears, rapidly progresses to neck, trunk and extremities. On the tonsils, they develop as blue-grey pinpoint papules **– Herman's spot** and on buccal mucosae, **Koplik's spots** against second molar. On biopsy, syncitial giant cells are seen in epidermis and **Warthin-Finkeldey giant cells** in lymph nodes.

Rubella: It is traditionally known as third disease caused by single-stranded RNA virus—Togavirus. **Pinpoint petechiae** are seen on soft palate and uvula – **Forchheimer spot.**

Erythema infectiosum, known as fifth disease is caused by **Parvovirus B_{19}.** Disease mainly occurs between 4 and 10 years. Typical skin rash is **"slapped cheek appearance"** with perioral pallor. If pregnant ladies develop parvovirus infection, it leads to vertical transmission (33%), results in self-limited aplastic anemia, fetal hydrops, spontaneous abortion (1st trimester), miscarriage and stillbirth. Viral tropism is medicated through 'erythrocyte p' antigen. So, persistent infection leads to severe chronic anemia.

1st disease	-	Measles
2nd disease	-	Scarlet fever
3rd disease	-	Rubella
4th disease	-	Dukes' (not now)
5th disease	-	Erythema infectiosum
6th disease	-	Roseola infantum
Fever and rash	-	**Day of onset of rash after fever**
Very	-	Varicella (1st day)

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Sick	-	Scarlet fever (2nd day)
Person	-	Smallpox (3rd day)
Must	-	Measles (4th day)
Take	-	Typhus (5th day)
Double	-	Dengue (6th day)
Tea	-	Typhoid (7th day)

3. Ans. (a) Poxviridae *(Ref: Rook's Textbook of Dermatology, 8/e p33.2-33.3)*

Poxviruses are the largest animal viruses.

They are double-stranded DNA viruses that multiply in the cytoplasm of the affected cell and produce **eosinophilic inclusion (Guarnieri bodies)** in the cytoplasm. Main infections caused by poxviridae include variola (smallpox), vaccinia, cowpox (orthopox), orf (parapoxvirus), Milker's nodule/pseudocowpox (teats of cow) and molluscum contagiosum. The most common type of Molluscum contagiosum viral type in children is Type 1 and in HIV, it is MCV-2.

Togaviridae: They are single-stranded small RNA viruses. Common diseases produced by these viruses are rubella and chikungunya.

Parvovirus: Smallest virus. It is a single-stranded DNA virus causing erythema infectiosum and aplastic crisis.

Paramyxoviridae are largest RNA viruses. This cause measles, mumps.

4. Ans. (a) Epstein-Barr virus *(Ref: IADVL Textbook of Dermatology, 4/e p637-638)*

EBV is the most common cause, others are infrequently reported causes.

5. Ans. (a) HSV type-1 *(Ref: Rook's Textbook of Dermatology, 8/e p33.35)*

HSV type 1 is the commonest cause.

Coxsackie A16 and vaccinia also can cause this disease

Varicella won't cause Kaposiv's Varicelliform eruption

Kaposi's varicelliform eruption is a widespread cutaneous infection with a virus, which normally causes localized or mild vesicular lesions. Predisposing causes are atopic dermatitis, exfoliative dermatitis, Darier's disease, Hailey-Hailey disease, etc. Synonyms are eczema herpeticum/eczema vaccinatum/eczema coxsackium.

6. Ans. (c) Herpes virus-8 *(Ref: Andrews' Diseases of the Skin, 12/e p596)*

Coxsackie virus A16 produces Hand Foot Mouth Disease.

In hepatitis C infection, only 1/3rd patients are symptomatic. Remaining will have chronic infection and may be associated with various skin disorders like different patterns of vasculitis including PAN, porphyria cutanea tarda (PCT), mucosal lichen planus and **necrolytic acral erythema**.

Kaposi's sarcoma is an idiopathic vascular tumour of skin. HHV-8 has been involved in the pathogenesis of both classic and HIV-associated KS. HIV-associated KS is mainly seen in homosexual men with CD4 count <500/mm^3.

HSV-2 produces mainly genital herpes. Neonatal herpes is mainly due to HSV-2.

7. Ans. (c) Unusual development of inflammatory lesions within the affected dermatome following herpes zoster. *(Ref: Andrews' Diseases of the Skin, 12/e p376)*

Koebner phenomenon: Development of similar lesions at the site of trauma.

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It can be true Koebner or pseudoKoebner. True koebner is due to increased production of TNF and IL-6 at the site of injury. PseudoKoebner is due to extension of infective lesion due to trauma.

For example: Verruca vulgaris, Molluscum contagiosum.

Disappearance of skin lesions at the site of trauma is known as reverse Koebner, for exqample, Granuloma annulare.

Development of inflammatory lesions, like lichen planus, sarcoidosis, granuloma annulare, lichen sclerosis, Kaposi's sarcoma at the site of healed herpes zoster is known as isotopic response.

8. Ans. (d) Epstein-Barr virus infection*(Ref: Andrews' Diseases of the Skin, 12/e p377-378)*

Congenital varicella (CV) syndrome occurs if mother is having varicella during first and second trimesters. Incidence is 0.4% if maternal infection occurs before 12 weeks of pregnancy and 2% if maternal infection occurs between 13 and 20 weeks. CV syndrome is characterized by a series of anomalies like unilateral limb hypoplasia, cutaneous scars, ocular and CNS defects.

If primary rubella infection occurs during the first 11 weeks of intrauterine life, overall risk of fetal damage is about 85%. Heart and eye damage is the most frequent involvement if infection occurs within 6 weeks. If primary infection is between 12 and 16 weeks of pregnancy, transmission is 35% and is mainly deafness. Mental deficiency occurs in all if infection occurs within 16 weeks of pregnancy. After 16 weeks of pregnancy, infection does not produce any fetal damage. Maternal re-infection has considerably low risks for fetus but should be followed up for malformation of fetus.

CMV infection: Primary infection in the first and second trimesters of pregnancy produces multiple defects in fetus. They are hepatosplenomegaly, jaundice, cerebral calcifications, chorioretinitis, microcephaly, mental retardation and deafness. It is a condition that produces blueberry muffin baby. Most infants die within 2 months and survivors usually have severe neurological damage.

EBV infection: This infection has no vertical transmission. This virus produces different types of diseases, like **infectious mononucleosis (glandular fever), oral hairy leukoplakia in immunosuppressed** individuals, Gianotti-Crosti Syndrome (papular acrodermatitis), Lipshutz ulcer (painful genital ulcer in adolescent females without venereal infection) and **papular-purpuric glove and stocking syndrome,** etc.

9. Ans. (a) Cytomegalovirus infection and (b) Rubella

(Ref: Andrews' Diseases of the Skin, 12/e p379 and 394)

Originally described with congenital Rubella but is associated with many disorders that produce extramedullary erythropoiesis, from erythopoietic tissue in the dermis derived from undifferentiated dermal mesenchyme. Clinically red papules or nodules which last for 4–6 weeks are seen. Etiologic factors are congenital infections, like toxoplasmosis, rubella, cytomegalovirus and blood dyscrasias.

10. Ans. (d) Thoracic *(Ref: Rook's Textbook of Dermatology, 8/e p33.25)*

Thoracic is the most common (53%) dermatome involved in all ages but relative frequency of ophthalmic zoster increases in old age. In trigeminal zoster, when

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vesicles are seen on the side of nose, there may be eye involvement also. It is due to the involvement of nasociliary nerve **(Hutchinson's sign**). Another Hutchinson's sign is seen in malignant melanoma, i.e. melanoma on the nailbed produce pigmentation in proximal nailfold.

11. Ans. (c) Chikungunya *(Ref: IADVL Textbook of Dermatology, 4/e p607-611; Andrews' Diseases of the Skin, 12/e p392-393)*

Dengue is caused by dengue viruses 1, 2, 3 and 4 transmitted by female Aedes aegypti. Skin lesions are maculopapular eruption (islands in sea of red) purpura, ecchymoses.

Ebola viral infection occurs in human through female bat blood (animal reservoir) and body fluids of infected humans. It is, highly contagious disease with high fatality. Disease starts as fever and headache (phase I). During phase II, acute gastroenteritis develops. 50% patients develop measles-like rash with livid erythema initially on extremities and then extend centripetally (reverse of measles). In phase III, there is multiorgan failure. Skin lesions occur in phase II.

Chikungunya: Chikungunya virus is transmitted byAedes aegypti and Aedes albopictus (Asian tiger mosquito) in Asia. Clinical symptoms are fever and incapacitating polyarthralgia. Skin lesions are maculopapular rash melasma like and freckle like and rarely flagellate (typical flagellate pigmentation produced by bleomycin). Rarely vesicles and aphthae occur in both oral and genital mucosae.

$HHV_{6,7}$ causes Roseola infantum, pityriasis rosea. HHV_6 is considered as a trigger for drug-induced hypersensitivity syndrome (DIHS, DRESS).

12. Ans. (b) Verruca vulgaris *(Ref: IADVL Textbook of Dermatology, 4/e p597)*

Molluscum contagiosum shows large intracytoplasmic inclusion bodies in the epidermal cells known as Henderson-Patterson bodies.

Koilocyte is the vacuolated keratinocyte which is the characteristic finding of papilloma viral infection.

In CMV, infected cells are enlarged and they also show intranuclear inclusion bodies. In viral culture, the inclusions appear as 'owl-eye'.

Kawasaki disease causes vasculitis.

13. Ans. (a) Verruca vulgaris *(Rook's Textbook of Dermatology, 8/e p33.42)*

Mainly caused by HPV-2

Other warts produced by **HPV-2** are superficial plantar warts **(mosaic warts)**. But deep plantar warts **'myrmecia'** by **HPV-1**.

Butcher's wart: Warts on hands of meat, poultry and fish handlers are produced by **HPV-7.**

Plane wart—mainly due to 3,10.

Anogenital wart (condyloma acuminatum)

HPV-6 causes 75% of genital wart, remainder by HPV-11. **Buschke-Lowenstein tumor** (Giant condyloma acuminatum) is a rare aggressive wart-like lesion which is a verrucous carcinoma. Unlike other HPV-induced genital carcinomas it is caused by HPV-6 and 11. Treatment is complete surgical excision.

Respiratory papillomatosis is caused mainly by HPV-11 and also by HPV-6.

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14. Ans. (b) 16, 18 *(Ref: Andrews' Diseases of the Skin, 12/e p403-404)*

Cervical Ca and cervical intraepithelial neoplasia are associated with high-risk persistent HPV infection in the genitalia. Other reported malignancies associated with these viruses are laryngeal Ca, penile and vulvar Ca. Oncogenic potential of these viruses is due to the expression of early protein like E_6—which inactivates the tumor-suppressor protein P53 and E7 that inhibit RB protein from its normal function.

Treatment of wart

Topical: Salicylic acid 12–20%

20% podophyllin, **Imquimod 5% (Immunomodulator)**—3 times a week, Cidofovir 1%

Electrocautery

Cryotherapy good for all warts but anogenital wart responds better.

- Cryogens: **Liquid Nitrogen** (–196°C), nitrous oxide (– 89°C), CO_2 (– 79°C)

Two HPV vaccines are available Gardasil and Cervarix. Gardasil is quadrivalent (HPV 16, 18, 6, 11) and Cervarix is bivalent (HPV 6, 11). Recommended for females aged 13–26 years and males 9–26 years.

15. Ans. (d) HPV 5, 8 *(Ref: IADVL Textbook of Dermatology, 4/e p606)*

HPV vaccines

Epidermodyoplasia verruciformis (EDV) is an inherited disease characterized by widespread HPV infection and malignancies. EDV patients are infected with multiple HPV types. **HPV 5, 8** are seen in more than 90% of EDV-associated malignancies. The disease starts in childhood. In 20–30% patients, squamous cell carcinoma develop by an average age of 24 years. Sun exposure augmenta the development of skin cancer. Patients with EDV have a defective cell-mediated immunity to HPV infection.

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Salient Features

- Included all the areas covered in previous entrance exams and also latest questions of 2015 and 2016
- Quick and in depth coverage for scoring in exams conducted by institutes
- Concepts made clear in a nutshell
- Charts and image-based questions included
- Chapters on HIV and cosmetology
- Authored by experienced academicians in dermatology.

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