

# **DRUG ERUPTIONS AND SKIN TREATMENT**

# INTRODUCTION

## Drug eruptions :-

are adverse cutaneous reactions caused by ingestion, parenteral use, or local application of a drug.

- Cutaneous reactions to most drugs occur at very low rate (about **1/1000** exposure).
- **Penicillins** and **Co-trimoxazole** are commonest drugs causing cutaneous eruptions (**30-50/1000** exposure).
- Almost any drug can cause a drug eruption.
- Incidence of drug eruptions to certain medications may increase in certain diseases e.g. **AIDS & IMN**.

# **PATHOGENESIS OF DRUG ERUPTIONS**

## **1. Non-Immunological (Non-Allergic) Reactions**

- Often predictable**
- Affect most patients taking the drug at a sufficient dose for a sufficient time**

## **2. Immunological (Allergic) Reactions**

- Less predictable**
- Occur in minority of individuals**
- Can occur even with low doses**
- Chemically-related drugs may cross-react**

# NON-IMMUNOLOGICAL MECHANISMS

	MECHANISM	EXAMPLE
1	Unwarranted pharmacological effect	Striae due to Corticosteroids Mouth ulcers due to MTX
2	Drug overdosage or failure to metabolise or excrete drug	Morphine rashes in patients with liver dis Vancomycin Red-man Syndrome
3	Drug interaction	Warfarine toxicity when coadministered with aspirin or phenylbutazone
4	Phototoxic reaction	Chlorpromazine-induced light Rx.
5	Altered skin ecology	Tetracyclines causing vaginal candidiasis
6	Cumulative effects	<b>Argyria:</b> Silver preparations (long periods) cause a slate-grey pigmentation Lichenoid reaction to Gold

# NON-IMMUNOLOGICAL MECHANISMS

	MECHANISM	EXAMPLE
7	Metabolic alteration	Oral Retinoids increasing plasma lipid levels may cause xanthomas
8	Exacerbation of pre-existing skin dermatosis	Lithium or Beta-blockers worsening of psoriasis Griseofulvin exacerbates SLE Iodide or Bromide exacerbates acne
9	Idiosyncratic reaction (An odd .Rx. peculiar to an individual)	Drug-induced variegate porphyria (may be genetically-determined)
10	Intolerance (severe effect within the spectrum of the drug action)	Methaemoglobinaemia due to Dapsone

# IMMUNOLOGICAL MECHANISMS

## 1. IMMEDIATE REACTION

- TYPE-I HSR
- It is IgE-mediated reaction
- The effector cell is mast cell
- The onset is 15-20 minutes of drug administration
- Example: **Penicillin-induced urticaria**

## 2. CYTOTOXIC REACTION

- TYPE-II HSR
- The effector cells are Cytotoxic T-lymphocytes
- The onset is 8-10 hours after drug intake.
- Rarely responsible for drug eruption.

# IMMUNOLOGICAL MECHANISMS

## 3. IMMUNE COMPLEX REACTION

### □ TYPE III-HSR

- The complement system, chemotactic factors and hydrolytic enzymes are involved.
- The onset is usually 8-10 hours of drug administration

### EXAMPLES

- ✓ Serum sickness due to Penicillin or animal anti-sera.
- ✓ Drug-induced vasculitis or erythema multiforme.

# IMMUNOLOGICAL MECHANISMS

- 4. **CELL-MEDIATED REACTION**
- **TYPE IV-HSR (DELAYED HSR)**
- **The effector cells are T-lymphocytes**
- **The onset is 48-72 hours of drug exposure**

## EXAMPLES

- ✓ **Allergic contact dermatitis: Neomycin, Local Anaesthetics.**
- ✓ **Drug-induced Photo-allergic reactions.**



**There are two methods of studying the clinical patterns of drug eruptions:**

- 1. Morphological patterns and their causative drugs**  
e.g. Toxic erythema, Urticaria, Purpura ....
- 2. Drug or group of drugs and their eruptions** e.g.  
Anticonvulsants      Hypersensitivity      Syndrome  
Sulphonamide's      Hypersensitivity      Syndrome      or  
Allopurinol Hypersensitivity Syndrome ...

# TOXIC EPIDERMAL NECROLYSIS (TEN)

## Lyell's disease

Scalded Skin Appearance in adults

Histologically: Subepidermal split with epidermal necrosis

## CAUSES OF TEN

1. **Drug-induced** (commonest)
2. **Unexplained** (Idiopathic)

More than **100** medications may cause TEN.

## Causative Drugs

1. **Barbiturates**
2. **Phenytoin**
3. **Phenylbutazone**
4. **Oxyphenbutazone**
5. **Sulphonamide**
6. **Penicillins**
7. **Tetracycline**
8. **Carbamazepine**
9. **Allopurinol**
10. **NSAIDS**

**TEN**



**DRUG-INDUCED TEN**



**TEN**

**TEN**

**DRUG-INDUCED TEN (HYDANTOIN)**

- ✓ Usually affects adults
- ✓ **Onset:** fever and painful erythema starting near body flexure and spreads to other parts.
- ✓ **Later:** huge blisters with subsequent epidermal shedding leaving exposed dermis (denuded skin).
- ✓ **Nikolsky's sign** is positive
- ✓ One of skin emergencies
- ✓ **Mortality rate** is high (30%)
- Loss of fluids & electrolytes
- Sepsis



**DRUG-INDUCED TEN**

# **Treatment:-**

- In all cases, treatment includes discontinuing the drug that caused your reaction.

**Hospitalization.** Everyone with TEN needs to be cared for in a burn unit.

**Ointments and bandages.** Proper wound care will prevent further skin damage and protect the raw skin from fluid loss and infection.

**Intravenous (IV) fluid and electrolytes.**

**Isolation.**

- Medications used to treat TEN include:

**Antibiotics.**

**Intravenous immunoglobulin G (IVIG).**

Immunoglobulins are antibodies that help your immune system.

**TNF alpha inhibitor etanercept and immunosuppressant cyclosporine.** These are promising treatments .

# FIXED DRUG ERUPTION (FDE)

- ❑ **Definition:** the occurrence of a round, erythematous or purple and sometimes bullous plaques which subsides leaving a distinctive round post-inflammatory area of hyperpigmentation and then **recurs** in the same site each time the drug is ingested.
- ❑ **Distribution:** anywhere but especially **face, back of hands, genitalia, limbs or within the mouth.**
- ❑ The condition may become quite extensive.
- ❑ However **stopping the drug** does resolve the problem.

# **FIXED DRUG ERUPTION**

## **(FDE)**

### **CAUSATIVE DRUGS**

- 1. Sulphonamide\***
- 2. Phenolphthalein\* (in laxatives & purgatives)**
- 3. Barbiturates**
- 4. Tetracyclines**
- 5. Erythromycin**
- 6. Trimethoprim**
- 7. Quinine**
- 8. Griseofulvin**
- 9. NSAIDs (e.g. Naproxen and Mefenamic acid)**



## **Treatment Options:-**

- 1) Stop offending agent.**
- 2) Potent topical steroids.**
- 3) Antihistamines.**
- 4) Oral corticosteroids.**



**FDE ON THE FACE  
(SOLITARY LESION)**



**FDE ON THE DORSUM  
OF THE HAND**



**FDE (Phenolphthalein)**



**A unique characteristic pigmentation usually persists between attacks**

## Treatment of drug eruption:

- ◉ *Withdrawal of the suspected drug as much as possible.*
- ◉ *In urticaria :- antihistamines, or sometimes systemic steroids. Calamine or topical steroids are used sometimes.*
- ◉ *For anaphylactic reaction:*
  - 1-Ensure opened airways*
  - 2-Subcutaneous adrenaline (1:1000) 0.3-0.5 mL*
  - 3-Intravenous hydrocortisone (100mg)*

# Treatment in dermatology

# Therapeutic options in dermatology

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Drugs

Topical

Systemic

Physical

Surgical

excision

curettage

Intralesional injection

Electrodessication

Cryotherapy

Radiotherapy

Phototherapy

Laser therapy

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## Topical treatment:

- **Topical medicament is composed of an (active ingredient) and a (vehicle).**
- **Vehicle aids in absorption of the active ingredient and preservation.**
- **Examples of active ingredients: corticosteroids, antibiotics, antifungal and antiviral agents, and many others.**
- **Examples of vehicles: Most vehicles are a mixture of powders, water and greases (usually obtained from petroleum).**

*The penetration of a drug through the skin depends on the following factors:*

*1) Its concentration;*

*2) The vehicle;*

*3) The thickness of stratum corneum;*

*4) The state, including hydration, of stratum corneum;*

*5) Temperature.*



## Systemic therapy

**Systemic treatment is needed if:**

- 1. A skin condition is associated with systemic disease.**
- 2. The medicament of choice is inactive topically.**
- 3. The topical treatment failed to treat the disease.**
- 4. The disease is severe or extensive.**

## **Physical treatment:**

- **Surgery:** It is indicated for biopsy, skin tumors, and many other conditions.
- **Intralesional injection** is indicated in many conditions like:
  1. Intralesional steroid injection for alopecia areata or keloid.
  2. Intralesional sodium stibogluconate injection for cutaneous leishmaniasis.

- **Electrodesiccation is dehydration of tissue by the use of a high frequency electric current. It is usually combined with curetage and needs local anesthesia. Indications include warts, xanthelasma, etc...**
- **Cryotherapy is the treatment of disease by use of cold. Freezing is achieved by liquid nitrogen. Indications e.g wart, molluscum, actinic keratosis .**
- **Radiotherapy is the treatment of disease by ionizing radiation. It can be used to treat skin cancers in patients older than 70 years of age, or in those who can not tolerate surgery.**

- **Phototherapy** which is the treatment of disease by exposure to light, e.g. PUVA, when methoxypsoralen (topical or systemic) is combined with ultraviolet radiation. It is indicated in diseases like vitiligo and psoriasis.
- **Laser therapy**: Examples of indications: Tatoo removal, removal of excess hair, resurfacing (i.e. treatment of scars and wrinkles) , etc....

*Thank You*