



PRECLINICAL SCREENING OF ANTI ALLERGIC DRUGS



CONTENTS

- ❖ Introduction
- ❖ Hypersensitivity reactions
 - Type I, Type II, Type III, Type IV
- ❖ Classifications of anti allergics
- ❖ Screening models
 - In vivo methods

INTRODUCTION

- ❖ A condition in which the immune system reacts abnormally to a foreign substance known as allergy.
- ❖ It can be Drug allergy, Food allergy or Contact dermatitis.
- ❖ Symptoms vary and may include swelling, rash, itching, fever etc.

Hypersensitivity:-

- ❖ A hypersensitivity reaction is an over reaction of your immune system to something that would not usually cause an immune response. This leads to allergy symptoms.

TYPES OF HYPERSENSITIVITY REACTIONS

- ❖ **Type I** : Reaction mediated by IgE antibodies.
- ❖ **Type II** : Cytotoxic reaction mediated by IgG or IgM antibodies.
- ❖ **Type III** : Reaction mediated by immune complexes.
- ❖ **Type IV** : Delayed reaction mediated by cellular response.

ANTI ALLERGIC DRUGS

❖ For the treatment of immediate type reaction:-

- H1 histamine blockers:- Dimedrole, Diprazin, Loratidine.
- Decrease tissue alteration:- Corticosteroids, NSAIDs.

❖ For the treatment of delayed type reaction:-

- Immunosuppressant:- Cyclosporine, Azathioprine.
- Decrease tissue alteration:- Corticosteroids, NSAIDs.

PRECLINICAL SCREENING OF ANTI ALLERGICS

❖ IN VIVO MODEL

- Acute systemic anaphylaxis in rats.
- Arthus type immediate hypersensitivity.
- Delayed type hypersensitivity.
- Anti anaphylactic activity in guinea pigs.
- Passive cutaneous anaphylaxis in rats.

Acute Systemic Anaphylaxis In Rats

PURPOSE AND RATIONALE:

- ❖ Rats are sensitized by ovalbumin and bordetella pertusis.
- ❖ After 11 days they are challenged by I.V. ovalbumin leading to shock.
- ❖ It is counteracted by corticosteroids and I.V. disodium cromoglycate.

PROCEDURE

Female sprague dawley rats (120-150gm.)



Injected I.M. with 10mg/kg of ovalbumin with bordetella pertusis suspension I.P.



IgE Ab migrates to surface of mast cells & basophilic granulocytes.



After 11 days I.V. injection of 25mg/kg ovalbumin given.



18 hours before given with dexamethasone 10mg/kg and disodium cromoglycate.

EVALUATION

- ❖ Symptoms of shock scored and mortality recorded.
- ❖ Compared with untreated animals.

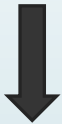
ARTHUS TYPE IMMEDIATE HYPERSENSITIVITY

Procedure:-

Wistar or Sprague-Dawley rats weighing 220-280 gm can be used.



Seven days prior to start of the experiments rats are sensitized by I.M. administration of 0.5 ml of the ovalbumin suspension.



24 hrs to induction of the arthus reaction, test compounds are administered. (*std. drug-10mg/kg prednisolone*)



Then the rats are challenged by injection of 0.1 ml of 0.04% soln of highly purified ovalbumin in the left hind paw.



Swelling of the paw occurs which reaches a maximum after a few hrs.



EVALUATION

- ❖ Footpad thickness is measured and compared with control group.
- ❖ The change in footpad thickness is expressed as the % change from the control group.

DELAYED TYPE HYPERSENSITIVITY

❖ PURPOSE AND RATIONALE:-

- ❖ It is a reaction of cell mediated immunity and becomes visible only after 16-24 hrs. The same method has for testing immediate type hypersensitivity can be used.

Procedure:-

Rats are sensitized by I.M. ovalbumin suspension 0.5 ml 7 days prior to the experiment.



They are challenged by injection of 0.1 ml of 0.04% soln of highly purified ovalbumin in the left hind paw.



10 mg/kg Prednisolone used for the std. drug



Footpad thickness is measured immediately and after 24 hrs of ovalbumin administration.

❖ **EVALUATION:-**

- ❖ Footpad thickness is measured and compared with control group.
- ❖ The change in footpad thickness is expressed as the % change from the control group.