

Lab. 7



To demonstrate the anti-inflammatory property of drug against carrageenan induced paw edema

Presented by:

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Inflammatory Activity

Object- To study the anti-inflammatory property of indomethacin against carrageenan induced paw oedema in rats.

Terminology used in object

Inflammation- Swelling along with pus formation.

Anti-inflammatory- Agent (Drug) used to restore the inflamed tissue.

Indomethacin- An example of anti-inflammatory drug.

Carrageenan- Stimulus or agent which cause inflammation, it is sulphated polysaccharide obtained from sea weed.

Oedema- Pus with inflamed tissue.



Normal tissue



Inflamed tissue

PRINCIPLE:

Inflammation is a pathophysiological response of living tissue to injury that leads to local accumulation of plasmatic fluid and blood cells. Although it is a defense mechanism that helps body to protect itself against infection, burns, toxic chemicals, allergens or other noxious stimuli. The carrageenan-induced paw edema model in rats is known to be sensitive to cyclooxygenase inhibitors and has been used to evaluate the effect of non-steroidal antiinflammatory agents, which primarily inhibit the cyclooxygenase involved in prostaglandin synthesis. Amongst the different methods applied for measuring inflammation, there have been estimates of the volume of edema by measuring the dorso-ventral diameter of rat hind paw pads or comparing the weights of excised limbs. Inserting the inflamed paw in a tube of fluid elevates the fluid level, and test and control levels can be compared. It is a rapid as well as reproducible method.

In the experiment, it measures the volume of the rat paw in the presence and absence of irritant and after the treatment of anti-inflammatory drug.

Materials and Methods

Materials

Animal/species : Rat/Wistar

Sex/body weight : Male/ 150-250 g

Syringe/needle : 1 ml/ preferably 26G

Drug : Indomethacin (8 mg/kg , po), carrageenan (0.1 ml of 1% sol, s.c)

Instrument : Plethysmograph

Equipment- Plethysmometer. It is a simple apparatus having two tube out of which one tube is having mercury on it, an the other tube shows the movement or expansion of mercury after placing the fixed length of rat paw. When paw is placed the level of mercury increased due to displacement pressure applied by rat paw. This is minimum before inflammation which increase after inflammation an then again reduce when drug is given.

Precautions before Experimentation

- Animals should be marked properly, to avoid mixing in two groups
- Clean the paw with wet cotton
- Mark the paw (the insertion part must be the same every time).

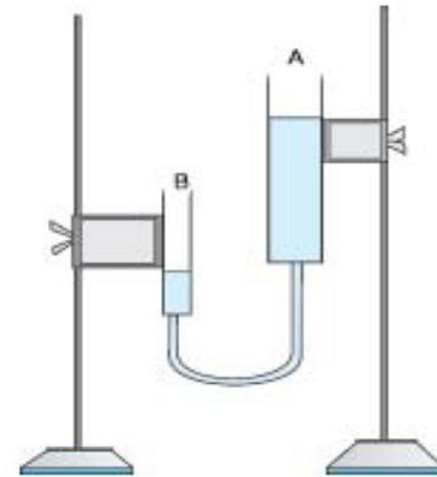


Fig. 22.1: Plethysmograph; Rat paw is immersed into the tube 'A' and the reading is checked through the tube 'B' (some set-up have digital display attached to it)

PROCEDURE:

- Weigh the animal and number them.
- Make a mark on both the hind paws (right and left) just beyond tibio-tarsal junction, so that every time the paws is dipped in the mercury (Hg) column up to fixed mark to ensure constant paw volume. Note the initial paw volume for both right and left legs of each rat by Hg displacement methods.
- Divide the animals in to two groups each comprising at least four rats.
- **Control group:** Inject saline
- **Test group (Indomethacin treated group):** Inject indomethacin subcutaneously.

- After 30 minutes inject 0.1 mL of 1% (w/v) carrageenan in to the plantar region of the left paw of control as well as indomethacin treated groups. The right paw will serve as reference non inflamed paw for comparisons.
- Not the paw volume of both legs of control and indomethacin treated rats at 15, 30, 60 and 120 minutes after carrageenan challenges.
- Calculate the % difference in the right and left paw volume of each rat of control and indomethacin treated group.
- Compare the mean % change in paw volume in control and indomethacin treated rat and express as % oedema inhibition by the indomethacin.

