Tail flick apparatus

principle

The tail-flick test is a test of acute nociception in which a high-intensity thermal stimulus is directed to the tail of a mouse or a rat.

The time from onset of stimulation to a rapid flick/withdrawal of the tail from heat source is recorded.

procedure

Weigh and mark the animals. Allow the animals to acclimatize. Hold the animal, gently cover with a glove to restrain.

Perform the experiment when the animal is calm and without movement of tail. Ensure that the animals have no previous damage in the tail at the time of experiment.

Hold the test animal under heat source and press the start button. Heat will be applied not more than 3 cm from the tip. After applying heat, the animal will withdraw its tail with sudden flick.

Set a timer at the start of application of heat and note down the time of withdrawal of tail. The withdrawal of tail from the heat source is referred to as tail flick latency.

Check the basal reaction time of animals and note down. When the reaction time reaches 10 sec, will be considered maximum analgesia to avoid damage.

Start the experiment 30 min after drug treatment.[2] Reaction time after 15, 30, 45 and 60 min of drug treatment will be noted.

Calculate the percentage of increase in reaction time or index of analgesia at above time interval.

-احمد محمد عبد المنعم علي -عبدالماجد سيد - عادل عاشور - محمد عبدالمنعم العطار
-احمد وليد محمد رفعت - محمد خالد -عبدالرحمن عامر
-مصطفي كمال عبدالرحيم - مصطفي محمود عبدالعزيز -محمد السيد انور -احمد محمد صديق

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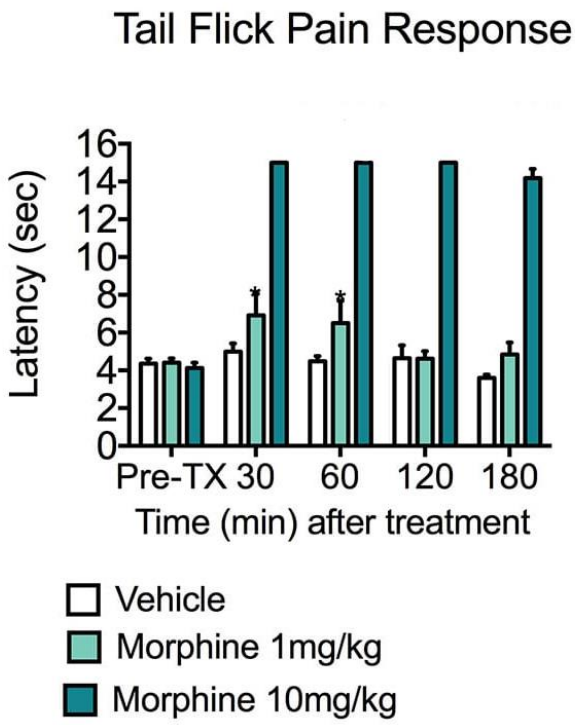
perform statistical analysis and calculate the means and standard errors for data presentation (Data generated using the tail-flick test are often expressed as the percent maximal possible effect: %MPE = (post injection latency – baseline latency)/[cutoff(10 sec) – baseline latency]. To determine an ED50 value (dose that produces 50% effect)

results

Morphine Activity in a Rat Tail Flick Test. Thirty minutes prior to drug administration, rats are held on a pre-heated tail flick apparatus. Once a tail flick response is observed, latency (seconds) to pain response was recorded.

After recording pre-treatment (Pre-TX) data, rats were dosed with vehicle, and two concentrations of morphine (1mg/kg or 10mg/kg) and tested at various time points. Rats dosed with 10 mg/kg morphine had significantly longer pain latency responses compared to vehicle.



-احمد محمد عبد المنعم علي
-احمد وليد محمد رفعت
-مصطفي كمال عبدالرحيم
-عبدالماجد سيد
- محمد خالد
- مصطفي محمود عبدالعزيز
- عادل عاشور
-عبدالرحمن عامر
-محمد السيد انور
- محمد عبدالمنعم العطار
-احمد محمد صديق

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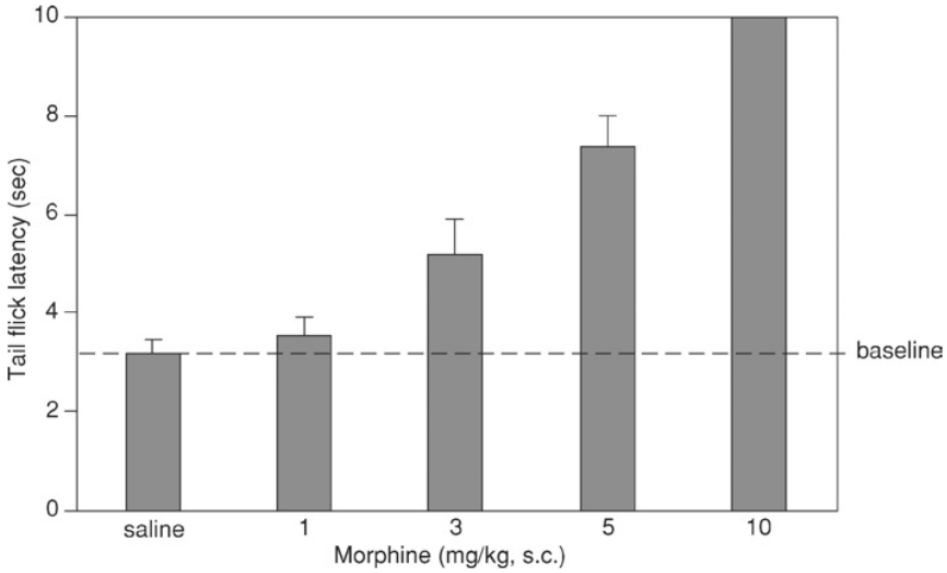
Effect of morphine in the tail flick test in mice. The mice were injected subcutaneously (s.c.) 30 min before the tail-flick test. n=5 to 8 animals per dose.



Drug	Basal reaction time(sec)	Reaction after 30 min of drug inj
control	1.5	0.12
TEST(A) 500mg/kg	1.3	3.8
Asprin 500mg/kg	1.4	3
Morphin5mg/kg	1.6	7

-احمد محمد عبد المنعم علي -عبدالماجد سيد - عادل عاشور - محمد عبدالمنعم العطار
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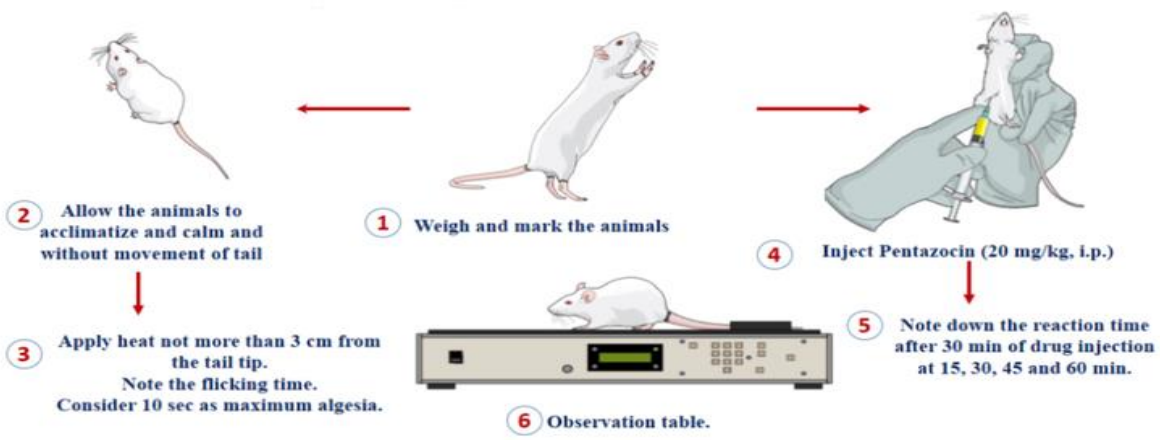

troubleshooting

Tail-flick test		
No response is observed before cutoff in untreated animals	Too low a stimulus intensity and/or handling/restraint effects	Increase stimulus intensity Acclimate animals to test before experiment
Large variability in response is observed	Possibly too high or low a stimulus intensity and/or handling/restraint effects	Adjust stimulus intensity Acclimate animals Make several determinations of tail-flick latency and calculate mean latency
No effect is observed for reference agent	Too high a stimulus intensity	Reduce stimulus intensity

CONCLUSION

Prolonged latency time ensures relief of pain. From this experiment it can be concluded that the tested drug has analgesic activity.

-احمد محمد عبد المنعم علي -عبدالماجد سيد - عادل عاشور - محمد عبدالمنعم العطار
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-مصطفي كمال عبدالرحيم - مصطفي محمود عبدالعزيز -محمد السيد انور -احمد محمد صديق