Testing Bromocriptine Dose Necessary For Suppression of Lactation in Rats: Morphological Study

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الخلاصة:

الهدف : تم احتساب اقل جرعة من عقار البروموكريتين ، اللازمة لاخماد الرضاعة، في الجرذ.

المنهجية : استخدم خمسون جرذ مرضع لهذه الدراسة. وقد استخدم مؤشرين (الفحص السريري و الفحص النسجي) للتأكد من اخماد الرضاعة.

النتائج : بينت النتائج بأن اقل جرعة من البروموكريتين القادرة على اخماد الرضاعة هي ٤ ملغم من البروموكريتين / كغم وزن الجسم / يوم. من المهم جدا معرفة الجرعة المضبوطة التي لها القابلية على اخماد الرضاعة في الجرذ لان هذا الحيوان المختبري غالبا ما يستخدم لمثل هذا الغرض.

Abstract:

Objectives: The lowest dose of bromocriptine, necessary for suppression of lactation in rats, was estimated in this investigation.

Methodology: Fifty healthy lactating rats were treated with different doses of bromocriptine. Cessation of lactation was assessed clinically and histologically.

Results: Revealed that the lowest dose capable of lactation suppression is 4 mg bromocriptine / kg body wt. / day.

It is very important to know the exact dose, which can suppress lactation in rats because these laboratory animals are commonly employed in experiments concerning this topic.

Key words: Bromociptine, Cessation of Lactation

Introduction

Bromocriptine is an ergot derivative with dopamine agonest properties [(1)]. It inhibits pituitary prolactin secretion via the stimulation of the release of prolactin-inhibiting factor from hypothalamus [(1,2,3,4)].

Bromocriptine is available as 2.5 mg parlodel tablets (bromocriptine mesylate – Sandoz).

It is well known that, of all hormones necessary for lactation, non is more important than prolactin hormone [(4,5,6,7)]. Therefore bromocriptine is commonly used to suppress lactation [(1)].

Bromocriptine dose ranges is 1.25 – 40 mg / day, depending upon indication [(8)]. However, to suppress lactation in human bromocriptine is given 2.5 mg daily for 2-3 days, then 2.5 mg twice daily for 14 days [(9)].

In rat, bromocriptine dose, necessary for suppression of lactation is not calculated previously. Therefore, the aim of this study was to perform a dose – testing experiment to achieve the lowest dose of bromocriptine required for lactation suppression.

Methodology

A total of fifty healthy lactating rats (Rattus rattus albinus norvigcus) were used in this study. They were isolated in a relatively controlled environment at a temperature of about 25 º C, in the "Animal Breeding Center" of the College of Medicine, University of Baghdad. They were given free access to tap water and food. Rats were divided into five groups (ten each). They were given different doses of bromocriptine (Table – 1).

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Parlodel tablets were crushed in a coffee grinder. The resultant powder was dissolved in distilled water (2.5mg bromocriptine powder / 4 ml distilled water). Then given twice daily, via oro – gastric tube, to a two-day lactating rat, for 14 days. Litters were not separated from their treated mothers during the whole period of the experiment (i.e. mothers continued the act of lactation during the treatment course).

Table (1) Animal grouping for bromocriptine dose – testing experiment

Group	No. of rats	Dose of bromocriptine (mg / kg body wt. / day)
I	10	2.5
II	10	3
III	10	3.5
IV	10	4
V	10	4.5

Doses were given to two-day lactating rats.

Two parameters were used to assess suppression of lactation in this experiment; the clinical milk cessation (squeezing the mammary gland did not yield any milk) and mammary gland morphology (Quick haematoxylin and eosin stained sections showed an involuted mammary gland).

Results:

Morphological parameter is listed in figure (1) and (2).

Dose – testing experiment revealed that, the lowest dose of bromocriptine necessary for cessation of lactation is 4 mg / kg body weight / day.

Discussion

Bromocriptine is a dopaminergic agonest. It inhibits pituitary release of prolactin. Therefore, it is used in the treatment of galactorrhoea, infertility associated with hyperprolactinaemia and in suppression of lactation. It is also used to reduce growth hormone levels in some patients with acromgaly and in the treatment of parkinsonism [(9)]. Accordingly, its dose has a very high range (1.25 – 40 mg / day). Although its dose (for suppression of lactation) is known in human, yet it is not worked out previously in rats.

This study showed that 4 mg bromocriptine / kg body weight / day is the lowest dose that is able to suppress lactation. This dose seems to be lower than that used in human (8.33 mg bromocriptine / kg body weight / day). However, it almost parallels the initial dose given to human in the first few days (4.16 mg bromocriptine / kg body weight / day).

In this investigation, lactating mothers were not separated from their litters during the whole course of treatment because suckling the nipple play a great role in galactopoiesis in the mother's mammary gland [(10)].

Lastly, rats are commonly used laboratory animals. Therefore, it is very useful to fix the exact dose of bromocriptine required to suppress their lactation to be used in future studies concerning this respect.

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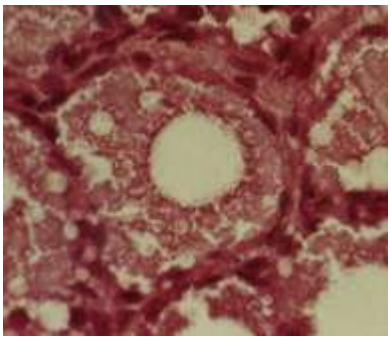

figure (1) Two days lactating mammary gland section, stained by haematoxylin and eosin stain. Note acinus is widely dilated and filled with milk secretion. (X 400)

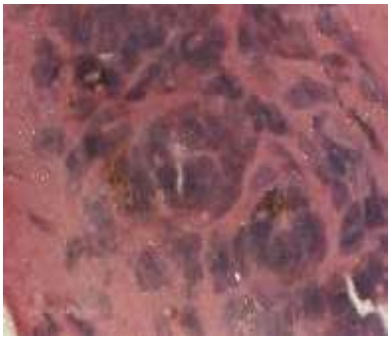

Figure (2) Haematoxylin and eosin stained section of a collapsed involuted mammary gland. Note the shrinked collapsed acinus. (X 400)