Effects of Precocious Pinealectomy and Hemicastration on Pituitary and Plasma LH Levels in Immature Male Rats

A. Hus-Citharel, S. Roseau, and W. Zurburg

Equipe de Neuroendocrinologie du CNRS, Collège de France, Paris, France

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Summary

In the immature male rat (7 to 28 days of age) precocious hemicastration provokes a marked compensatory testicular hypertrophy accompanied by a significant increase in pituitary LH content, and a non-significant increase in plasma LH level.

In pinealectomized and sham-pinealectomized animals, hemicastration had the same effect with some exceptions at certain ages.

Pinealectomy alone causes less evident changes in pituitary LH content than hemicastration. Only a transient effect was found, which was more evident in the hemastrated rats. Plasma LH was only increased in the pinealectomized hematicstrated rats at days 16 and 18.

It is concluded that pinealectomy in immature male rats seems to have only a transient stimulatory effect on pituitary and plasma LH levels, which is more striking in hematicstrated rats. So, hemicastration seems to sensitize the animals to the effect of pinealectomy.

Key words: Pinealectomy, hemicastration, compensatory testicular hypertrophy, pituitary LH, plasma LH, immature male rat.

Introduction

Precocious hemicastration in rats at the day of birth induces compensatory testicular hypertrophy (CTH) after 3 days (Yaginuma et al., 1969). When hemicastration is performed later after birth, a significant CTH is always observed after a delay of 3 days or more.
(Yaginuma et al., 1969; Jacobsohn and Norgren, 1965; Passouant-Fontaine and Flandre, 1968; Lombard-Des Gouttes and Scemama, 1967). When the animals are operated after about the age of 24 days, testicular hypertrophy no longer occurs (Vunder and Lapshina, 1974; Shellabarger, 1963).

In the immature male rat, effects of hemicastration on plasma and pituitary LH levels are not well known. Ojeda and Ramirez (1972) found that hemicastration at day 10 after birth was followed by a rapid increase in plasma gonadotropins which was significant for FSH, but not for LH.

In normal conditions, the effects of pinealectomy on gonadal function are not easily demonstrated. In seasonal breeders one observes an evident stimulation of gonadotropic function after pinealectomy in special conditions: Hoffman and Reiter (1965) found that pinealectomy counteracts the inhibitory action of darkness on sexual development of male hamsters. Reiter (1973) showed that hamsters of both sexes remained reproductively competent during the winter months, contrary to sham-operated animals.

In rats, Moszkowska and Scemama (1968 a, b) showed that pinealectomy partially compensated the inhibitory effects of darkness on reproductive organ development when the animals were kept in constant darkness and showed a decreased gonadotropic pituitary function due to postnatal treatment with testosterone according to Kordon and Hoffman (1967). However, rats with an intact pineal gland presented a striking testicular atrophy in these conditions.

In the present investigation we studied the effects of precocious hemicastration and pinealectomy on testicular growth and on pituitary and plasma LH levels under normal experimental conditions. The effects of pinealectomy in immature male rats sensitized by hemicastration are also presented.

**Materials and Methods**

**Animals**

Male Wistar rats, aged one day, with nursing mothers were purchased from the firm Janvier (Le Genest, France). The animals were hemicastrated, pinealectomized or sham-operated at the second day of age, and kept in a light (14 L: 10 D) controlled room. Autopsy was carried out beginning at day 7 until day 28 of age at intervals of one or two days.

At each day of age studied, the following experimental groups were used, each consisting of about 20 animals (10 experimental and 10 control ones).