

Poster presentation

Cerebellum and sexual behavior

Mukul Manna*

Address: Department of Physiology, City College, Kolkata, India

* Corresponding author

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Background

In some earlier studies, cerebellar ataxia causing hypogonadism was noted in human subjects [1]. Again massive destruction of cerebellum in rats was found to be consistent with the performance of lordosis (a mark of identifying female sexual behavior) by estrous rats. The results of my preliminary studies indicate that discrete lesions of the postero-cerebellar vermis disrupt reproductive behavior, delay onset of puberty, inhibit feeding behavior in female rats [2]. In the present studies. Selective lesions in the cerebellar vermis were produced in adult female rats to explore the possible role of cerebellum on sexual behavior.

Materials and methods

Animals

Holtzman derived virgin female rats ($n = 38$), weighing between 170–190 g, exhibiting 4-day normal estrous cycle and sexual receptivity (determined by manual stimulation test) were used.

Surgery

The discrete cerebellar lesions were produced by suction technique. The anterior cerebellar vermis (from lobule III-V), posterior vermis (from lobule VIII-X) and nodular (lobule X) region were removed. In sham operation, the dura was pierced but not sucked. All the aseptic measures were taken. Body weight and vaginal smear record were obtained daily.

Test for lordosis

Six weeks after cerebellar lesions (CBX), all the animals including the sham operated ones were subjected to bilateral ovariectomy.

Then after two weeks the animals were injected with standard dose of estradiol benzoate and progesterone and

on the 3rd day they were individually subjected to mating test with a stud male. Lordosis quality (Q) was measured on a "0" to "5" scale [3]. The presence or absence of lordosis was noted and expressed as lordosis quotient ($LQ = \text{no. of lordosis} \times 100/\text{no. of mounts}$).

After sacrificing the animals, from the serial sections of the brains, the extent of lesions in different animals were mapped and grouped as per the lesion.

Results

There was no appreciable change in movement disorder in the CBX animals when the tests for lordosis were conducted. Lordosis triggered by male mounting was significantly inhibited in postero-vermal lesioned animals, particularly affecting lobules VIII-X and caudal region of fastigial nucleus. Attenuation of lordosis responses in these animals was associated with persisted diestrus and a fall in circulating GTH but increase in prolactin levels.

Discussion

These findings support the view that the posterior part of the cerebellar vermis exert some tonic influences on the pathways responsible for the expression of female sexual behavior. CBX possibly destroys specific neural sites of hormone action, particularly, the estrogen and progesterone receptor sites in the specific regions of the cerebellum. Moreover, the observed impairments resulted from the destruction of specific neural loci involved in the integration of sensory inputs and/or motor components of lordotic reflex. Present results further confirm the regional differences of cerebellar motor functions [4].

References

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