

The Regulation of Gonadotrophin Secretion in Immature Ethanol-Treated Male Rats

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Exposure of immature male rats to 5% (w/v) ethanol as the sole drinking fluid from weaning age (21 days of age) resulted in a delay in balanopreputial separation (41.3 ± 1.4 days versus 37.6 ± 2.0 days in controls reared on tap water, $P < 0.02$). The purpose of this study was to determine whether this delay was associated with changes in the regulation of gonadotrophins in the prepubertal period. Three tests of gonadotrophin response were used: 1) the measurement of FSH and LH levels during the first 48 hours after castration performed at 28 days of age; 2) the sensitivity of the castration response to replacement therapy with testosterone propionate (TP) or estradiol benzoate (EB); and 3) the response of 25, 28, or 32-day-old males to doses of GnRH ranging from 2 to 200 ng/100 g body weight. Basal FSH levels were elevated in ethanol-treated rats but LH values were normal. Both FSH and LH concentrations rose more rapidly in the first 48 hours after castration in 28-day-old ethanol-treated animals than in controls. When replacement therapy with TP was initiated just prior to castration, ethanol-treated rats were slightly less sensitive to the suppressive effects of TP as indicated by the rate of rise of both FSH and LH levels during the first 48 hours after surgery. Castrated ethanol-treated rats were also slightly less sensitive to the suppressive effect of 0.5 μ g estradiol benzoate (EB). The ability of EB to suppress basal levels of LH in intact males at 28 days of age was similar in the two groups, but a significant decrease in FSH levels occurred in intact ethanol-treated rats. The pituitary response to GnRH decreased in both control and ethanol-treated rats from 25 to 32 days of age. At all ages tested, the FSH response was less in ethanol-treated animals than in controls. The LH response was lower in 25 and 32-day-old ethanol-treated rats than in controls. There was no difference between the LH responses in the control and the experimental groups at 28 days of age. It is concluded that the pubertal delay initiated by ethanol is associated with abnormalities in gonadotrophin, and especially FSH, regulation during the prepubertal period in the male rat.

Key words: ethanol, puberty, gonadotrophin regulation, FSH, LH

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