# Effect of 5α-androstan-17β-ol-3-one (DHT) and 5α-androstan-3α,17β-diol (3α-diol) on ether-induced prolactin secretion

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*Summary.* The effect of 5α-androstan-17β-ol-3-one (DHT) and of 5α-androstan-3α,17β-diol (3α-diol) on stress-induced prolactin hypersecretion has been investigated in castrated female rats. A 6-day treatment with 2 mg of these steroids does not inhibit the ether-induced increase in prolactin serum levels.

Data obtained in this and other laboratories indicate that testosterone is converted in the brain (mainly in the hypothalamus) and in the anterior pituitary into a series of 5α-reduced metabolites. Among these the most prominent ones appear to be 5α-androstan-17β-ol-3-one (dihydrotestosterone, DHT), 5α-androstan-3α,17β-diol (3α-diol) and 5α-androstan-3β,17β-diol (3β-diol)[1]. Very little information is available on the effects of these metabolites of testosterone on prolactin secretion[2-5]. In previous work it has been shown that DHT and 3α-diol (but not 3β-diol) when given for 6 days at the doses of 2 mg/rat/day may inhibit prolactin secretion in long-term castrated female rats in resting conditions[6]. This effect appears to be at variance with that of testosterone. This steroid has been reported by several authors either to stimulate or not to affect prolactin release[2,7-12]. It has been repeatedly reported that a variety of stresses enhance prolactin secretion in the rat[13-15]. The present experiments have been performed in order to analyze whether DHT and 3α-diol might counteract the stimulatory effect of stress on prolactin secretion. Adult female Sprague-Dawley rats (Nossan, Italy) were castrated under light ether anesthesia 5 weeks before starting the experiment.

The experimental groups were pretreated for 6 days with 2 mg/day of DHT or 3α-diol (Sigma, St. Louis). The steroids were injected s.c. in 0.2 ml of peanut oil. The same amount of oil was injected in 2 of the 4 control groups (oil controls non-stressed and oil controls ether-stressed). Since the 2 remaining groups of controls (controls non-stressed, controls ether-stressed) did not receive any treatment, they were handled each day for a few minutes. Stress consisted of the exposition to ether vapor for 2 min. After the application of stress, the animals were individually caged, in a silent room, and killed with a guillotine within 30 sec after removal from the cage. The same care to avoid handling and noise stresses was given to the control non-stressed animals. Blood was collected 14, 30 and 45 min after the end of ether application. Prolactin levels were determined by a specific RIA method[16]. RIA calculations were performed utilizing a Digital-Minc-11 computer connected on line with the counters. The logit-log transformation was used for the interrelation on the standard curve[17]. The data were analyzed by the 1-way analysis of variance. To determine the levels of significance of the responses, the t-values were compared to the values of Dunnett's table for multiple comparison[18]. It is clear from the table that treatment with the vehicle does not affect serum levels of prolactin. Ether stress significantly increases serum levels of prolactin at 15 min; this effect fades out at 30 and 45 min. The effect of stress at the 15-min interval does not appear to be influenced by the previous administration of either DHT or 3α-diol. The small increase of serum prolactin levels observed in DHT and 3α-diol-treated animals at 30 min is not statistically significant. The present data indicate that DHT and 3α-diol, 2 steroids which are able to decrease serum prolactin levels in animals not submitted to specific stresses, do not counteract the effect of ether stress on prolactin release. These results suggest that the inhibitory activity of these steroids on prolactin secretion is rather weak.

Effect of DHT and 3α-diol (2 mg/rat s.c. for 6 days) on serum prolactin levels in long term castrated female rats exposed for 2 min to ether vapors. Blood was collected 15, 30, 45 min after the end of stress

| | ng/ml RP-2 |
|---|---|
| Non stressed | 11.9±0.4 (8) |
| Non stressed + oil | 10.5±1.3 (7) |
| Stress 15 min | 17.5±2.2 (10)* |
| Stress 15 min + oil | 18.9±2.3 (9)** |
| Stress 15 min + DHT | 19.1±3.2 (9) |
| Stress 15 min + 3α-diol | 18.4±3.1 (9) |
| Stress 30 min | 13.4±1.1 (8) |
| Stress 30 min + oil | 13.2±2.0 (7) |
| Stress 30 min + DHT | 21.6±9.2 (6) |
| Stress 30 min + 3α-diol | 20.6±3.0 (8) |
| Stress 45 min | 12.1±0.8 (9) |
| Stress 45 min + oil | 15.4±2.6 (7) |
| Stress 45 min + DHT | 11.2±1.6 (7) |
| Stress 45 min + 3α-diol | 13.7±3.4 (7) |

Values are means±SEM. Number of animals in parenthesis. * Significant $p<0.05$ vs non-stressed; ** Significant $p<0.05$ vs non-stresses + oil.

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