Prolactin and prolactin receptor expression on the adrenal of hyperprolactinemic mice treated with estrogen and progesterone

Objective: To evaluate the effects of metoclopramide-induced hyperprolactinemia on prolactin and prolactin receptor expression by Immunohistochemistry. Methods: A total of 12 animals with intact ovaries were allocated to two groups: G1 (saline solution) and G2 (metoclopramide). A total of 30 oophorectomized animals was randomized to five subgroups: G3 (saline solution), G4 (metoclopramide), G5 (metoclopramide+17β-estradiol), G6 (metoclopramide+micronized progesterone), and G7 (metoclopramide+17β-estradiol+micronized progesterone). The drugs and the vehicle were administered subcutaneously using a volume of 100µL per solution. After 50 days, semi-quantitative immunohistochemical analysis of the adrenal gland was performed using the expression index (EI) calculation method. Results: All groups expressed prolactin and prolactin receptor; however, both the intensity and the frequency of labeled cells were heterogeneous. With respect to prolactin receptor, the area fraction of labeled cells varied from 1 (0%-10%) to 3 (> 50%). Based on the mean immunostaining intensity, G2 and G4 showed strong expression; G6 and G7 presented a mild reaction; and G1, G3, and G5 exhibited a weak reaction. Concerning prolactin, the area fraction of labeled cells varied from 1 (0%-10%) to 3 (> 50%), and groups G6 and G7 showed a strong reaction; G2, G4, and G5 showed a mild reaction; and G1 and G3 exhibited a weak reaction. Conclusion: Our data suggest that metoclopramide-induced hyperprolactinemia may increase prolactin receptor expression in the adrenal gland of mice. Furthermore, hyperprolactinemic animals treated with progesterone alone or in association with estrogen may have an increased prolactin expression.