Expression of the c-Kit receptor in germ cells of the seminiferous epithelium in rats with hormonal imbalance

Kamila Misiakiewicz, Agnieszka Kolasa, Anna Kondarewicz, Mariola Marchlewicz, Barbara Wiszniewska

Abstract

The aim of the study was to investigate the effects of pharmacologically induced hormonal imbalance in adult male rats treated with letrozole and rats exposed to soya isoflavones on the testicular morphology and c-Kit receptor (c-Kit-R) expression in germ cells. The study was conducted during all developmental periods: prenatal period, lactation, youth, and sexual maturity. Morphological and morphometrical analyses were performed on testicular section, and c-Kit-R was identified using immunohistochemistry. In addition, concentration of circulating steroids was measured in mature rats exposed to soya isoflavones. A significant reduction in testosterone level in rats exposed to soya isoflavones, and the sloughing of the premature germ cells into the lumen of the seminiferous tubules in the testes of both groups of rats were observed. Immunohistochemistry showed a decrease in c-Kit-R expression in germ cells of both experimental groups. Morphometric analysis indicated a decreased thickness of the layers occupied by c-Kit-R-positive spermatogonia, and a decreased diameter of the seminiferous tubules in the testes of both experimental groups of animals. In conclusion, the pharmacologically induced reduction of the estradiol level in adult rats and the diminished level of testosterone in rats exposed to soya isoflavones during the prenatal period, lactation and up to maturity caused similar morphological and functional changes associated with the decreased c-Kit-R expression in germ cells in the seminiferous epithelium. These findings demonstrate the importance of the estrogen/androgen balance for normal testicular morphology and spermatogenesis.

Keywords

Seminiferous epithelium; c-Kit receptor; Hormonal imbalance; Letrozole; Soya isoflavones