

Germinated brown rice and its bioactives modulate the activity of uterine cells in oophorectomised rats as evidenced by gross cytohistological and immunohistochemical changes

ABSTRACT

BACKGROUND: Germinated brown rice (GBR) is gaining momentum in the area of biomedical research due to its increased use as a nutraceutical for the management of diseases. The effect of GBR on the reproductive organs of oophorectomised rats was studied using the gross, cytological, histological and immunohistochemical changes, with the aim of reducing atrophy and dryness of the genital organs in menopause. **METHODS:** Experimental rats were divided into eight groups of six rats per group. Groups 1, 2 and 3 (sham-operated (SH), oophorectomised without treatment (OVX) and oophorectomised treated with 0.2 mg/kg oestrogen, respectively) served as the controls. The groups 4,5,6,7 and 8 were treated with 20 mg/kg Remifemin, 200 mg/kg of GBR, ASG, oryzanol and GABA, respectively. All treatments were administered orally, once daily for 8 weeks. Vaginal smear cytology was done at the 7th week on all the rats. The weight and dimensions of the uterus and vagina were determined after sacrifice of the rats. Uterine and vaginal tissues were taken for histology and Immunohistochemical examinations. **RESULTS:** GBR and its bioactives treated groups significantly increased the weight and length of both the uterus and the vagina when compared to Oophorectomised non-treated group (OVX-non-treated) ($p < 0.05$). Significant changes were observed in the ratio of cornified epithelial cells and number of leucocytes in the vaginal cytology between the oophorectomised non-treated and treated groups. There was also an increase in the luminal and glandular epithelial cells activity in the treated compared with the untreated groups histologically. Immunohistochemical staining showed specific proliferating cell nuclear antigen (PCNA) in the luminal and glandular epithelium of the treated groups, which was absent in the OVX-non-treated group. GBR improved the length and weight of the uterus and also increased the number of glandular and luminal cells epithelia of the vagina. **CONCLUSION:** GBR and its bioactives could be a potential alternative in improving reproductive system atrophy, dryness and discomfort during menopause.

Keyword: Germinated brown rice; Menopause; Uterine atrophy; Vagina dryness; Cytology; Histology; Immunohistochemistry