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PROTECTIVE EFFECT OF GREEN TEA CATECHINS ON SURGICAL MENOPAUSE INDUCED OVERACTIVE BLADDER IN A RAT MODEL

Hypothesis / aims of study

A rat model of ovariectomy-induced voiding dysfunction has been established which mimicked the urge incontinence in menopausal women. Green tea was widely consumed throughout the world. Previous studies have identified strong anti-inflammatory/antioxidant properties of green tea and its associated polyphenols. The aim of this study was to evaluate whether green tea extract, epigallocatechin 3-gallate (EGCG), could prevent ovariectomy induced overactive bladder.

Study design, materials and methods

The study included 48 female Sprague-Dawley rats, and the rats were divided into four groups. After bilateral ovariectomy, during 6 months period, twelve rats received intraperitoneal (IP) saline injection, twelve rats received EGCG 1uM/kg/day IP injection, and the other twelve rats received EGCG 10 uM/kg/day IP injection. Twelve rats were taken as sham group without ovariectomy surgery. The rats were sacrificed after 6 months, and isovolumetric cystometrograms were performed in all groups before and after the study. Immunofluorescence study included TUNEL assay and neurofilament stains to evaluate cell apoptosis and nerve damages. Western immunoblots were done to determine inflammatory markers, such as transforming growth factor (TGF- β) and fibronectin, as well as oxidative stress markers, nitrotyrosine and protein carbonylation levels.

Results

Long term ovariectomy significantly increased non-voiding contractions and treatment with EGCG, both 1 uM and 10 uM, significantly attenuated the frequency of non-voiding contractions. Ovariectomy significantly increased both mucosa and muscle layers apoptosis cells but decrease the number of neurofilament stains. Oxidative stress markers, nitrotyrosine and protein carbonylation levels significantly increased in ovariectomy group. EGCG can reverse these oxidative stress damages and has strong anti-inflammatory effects with a dose dependent fashion.

Interpretation of results

EGCG has strong anti-apoptotic and anti-inflammatory effect to decrease and protect bladder dysfunction induced by long term ovary hormone deficiency. EGCG also shows strong neuroprotective effect on decreasing intramural nerve damages.

Concluding message

This study confirmed that estrogen deficiency state was prone to develop overactive bladder and increased oxidative stress damages. EGCG could prevent ovariectomy induced bladder dysfunction through antioxidant and neuroprotective effects with a dose dependent fashion.

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What were the subjects in the study?	ANIMAL
Were guidelines for care and use of laboratory animals followed or ethical committee approval obtained?	Yes
Name of ethics committee	the Animal Care and Treatment Committee of Kaohsiung Medical University