THE EFFECT OF L-ARGININE ON BLADDER DYSFUNCTION FOLLOWING OVARIECTOMY IN A RABBIT MODEL

Hypothesis / aims of study
The present study was designed to investigate the effect of nitric oxide (NO) precursor, L-arginine, on bladder dysfunction following short term ovariectomy surgery.

Study design, materials and methods
Twenty-eight New Zealand white female rabbits were separated into seven groups. Groups 1 to 6 underwent ovariectomy surgery. Among them, groups 1 and 2 received ovariectomy without treating with L-arginine. Groups 3, 4, 5 and 6 were given high L-arginine diet and were sacrificed 1, 3, 7 and 14 days after ovariectomy, respectively. Group 7 was served as the control group. The effects of L-arginine on the contractile of bladder tissues were determined in response to various stimulations. In addition, L-arginine effects on the expression of smooth muscle contractile regulatory proteins (Rho-kinase (ROK), protein kinase C potentiated inhibitor (CPI-17)) and actin associated proteins, (caldesmon (CaD) and calponin (CaP)) were studied by immunoblotting.

Results
Ovariectomy significantly decreases contractile response to all forms of stimulation. Feeding rabbits L-arginine significantly increases contractile response at 1 day following ovariectomy but the response decreases to control level by 14 days. Ovariectomy increases both isoforms of CaD, CaP and CPI-17 expressions, L-arginine treatment induces ROK underexpression while CaP was overexpressed in the early few days of ovariectomy but returns to control level at 2 weeks ovariectomy.

Interpretation of results
Our results imply that L-arginine has potential benefits to stimulate additional production of NO after ovariectomy. Feeding rabbits with L-arginine prevents both CaD and CPI-17 over-expression after ovariectomy, showing the protective effect of NO on smooth muscle from ovariectomy-induced cytoskeletal remodeling.

Concluding message
Ovariectomy appreciably induced bladder dysfunction, and treatment with L-arginine have potential in the reversal of ovariectomy-induced bladder dysfunction, especially in the early few days following ovariectomy.

Specify source of funding or grant
This research is supported in part by the Office of Research and Development Medical Research Service, Department of Veteran’s Affairs; in part by NIH grant RO-1-DK 067114.

Is this a clinical trial?
No

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 Institutional Animal Care and Use Committee of the Stratton Veterans Affairs Medical Center