

# Abstract

Nutrition. 2011 Jul-Aug;27(7-8):809-15.

## Glutamine supplementation prevents collagen expression damage in healthy urinary bladder caused by radiotherapy.

Rocha BR, Gombar FM, Barcellos LM, Costa WS, Barcellos Sampaio FJ, Ramos CF.

Urogenital Research Unit, State University of Rio de Janeiro, Rio de Janeiro, Rio de Janeiro, Brazil.

**OBJECTIVE:** Patients who have had pelvic radiotherapy as part of their cancer therapy may develop subsequent urinary bladder effects such as hyperactive bladder, incontinence, and dysuria. Therefore, the goal of this study was to evaluate whether glutamine supplementation could prevent collagen expression damage in healthy urinary bladder caused by radiotherapy.

**METHODS:** Fifteen adult Wistar rats were separated into a control group that received food and water ad libitum (C group), an irradiated group that received a single pelvic radiation dose of 1164 cGy (I group), and an irradiated group supplemented with L-glutamine every day during the entire experimental period (0.65 g/kg of body weight; I + G group). All animals were sacrificed 15 d after irradiation. The extracellular matrix and muscle were quantified by a morphometric method. Picro Sirius Red was used to visualize the different collagen types. Reverse transcription-polymerase chain reaction and immunohistochemistry were used to determine collagen type I and III expressions.

**RESULTS:** The extracellular matrix (C group  $36.84 \pm 4.37$ , I group  $31.64 \pm 5.00$ , I + G group  $35.53 \pm 2.60$ ,  $P = 0.0001$ ), muscle (C group  $36.43 \pm 6.15$ , I group  $29.39 \pm 7.08$ , I + G group  $31.38 \pm 3.14$ ,  $P = 0.0001$ ), and gene expressions of collagen type I (C group  $1.067 \pm 0.31$ , I group  $0.579 \pm 0.17$ , I + G group  $1.816 \pm 0.66$ ,  $P = 0.0009$ ) and type III (C group  $0.99 \pm 0.28$ , I group  $0.54 \pm 0.13$ , I + G group  $1.07 \pm 0.28$ ,  $P = 0.0080$ ) were decreased in the I group. Apart from muscle, glutamine supplementation prevented these alterations. Immunohistochemistry and Picro Sirius Red showed similar results.

**CONCLUSION:** Supplementation with L-glutamine seems to prevent bladder wall damage in relation to extracellular matrix volumetric density and collagen expression. These results suggest that glutamine supplementation could be efficient in protecting healthy tissues from the adverse effects of radiotherapy.

PMID: 21167680