Abstract

INTRODUCTION:

The aim of this study was to evaluate the possible beneficial effect of raloxifene on cytokine production and ultrastructure of the spinal cord after spinal cord injury (SCI) in an animal model.

METHODS:

Forty-eight male, adult Wistar Albino rats were divided into 4 groups for this study: A (only laminectomy), B (trauma; laminectomy + spinal trauma), C (raloxifene group; laminectomy + spinal trauma + raloxifene treated) and D (vehicle group; laminectomy + spinal trauma + vehicle treated). SCI was achieved by compression of the spinal cord horizontally and extradurally for 1 minute with an aneurysm clip (Sugita no: 07-934-11, closing pressure of 1.37-1.72 N). Spinal cords were extirpated at T7-T12 level, and tissue samples of the spinal cord samples were gathered for tumor necrosis factor α (TNF-α)/protein and interleukin (IL)-1β/protein measurements at first and sixth hours. Spinal cords harvested at sixth hour were evaluated for ultrastructural changes.

RESULTS:

Both TNF-α/protein and IL-1β/protein levels in the samples harvested 6 hours after surgery in the group B (62.70 ± 6.67 pg/mg and 11.25 ± 1.37 pg/mg, respectively) were higher than those taken from group A (P = 0.002 and P = 0.041, respectively). Furthermore, TNF-α/protein and IL-1β/protein levels in the samples of animals treated with raloxifene (23.27 ± 5.27 pg/mg and 6.09 ± 0.77 pg/mg, respectively) were significantly lower than those taken from group B (P = 0.002 and P = 0.002, respectively). In the trauma group, electron microscopic examinations revealed deformities inside the cells and severe edema in neuropil. Raloxifene seemed to attenuate these ultrastructural changes at sixth hour after SCI.

CONCLUSION:

A single dose of 3.0 mg/kg of raloxifene intraperitoneally given 30 minutes after the induction of SCI reduced the production of TNF-α and IL-1β 6 hours after SCI and attenuated ultrastructural changes in a rat model.