Abstract

Background: Bleomycin (B) is an antineoplastic drug that has pulmonary fibrosis as a side effect. There are few experimental studies about the effects of physical therapy treatment in this case. Objective: The objective was to study rat lungs treated with B and precocious intervention by transcutaneous electrical diaphragmatic stimulation (TEDS).

Method: Wistar rats were divided into 4 groups (n=5): a control group (C); a stimulated group (TEDS); a group treated with a single dose of B (intratracheally, 2.5 mg/kg) (B); and a group treated with B and electric stimulation (B + TEDS). After the B instillation, the electrical stimulation was applied for 7 days, for a duration of 20 minutes. Lung fragments were histologically processed with hematoxylin and eosin (HE) and 8-isoprostane-PGF2 (8-iso-PGF2). The density of the alveolar area was determined by planimetry, the inflammatory profile was defined by the number of cells, and the level of oxidative stress in the pulmonary tissue was evaluated by 8-iso-PGF2. For statistical analysis of the data, the Shapiro-Wilk test was used, followed by a one-way ANOVA with the post-hoc Bonferroni test (p<0.05).

Results: The B group exhibited a significant reduction in the area density, and the acute treatment with B + TEDS prevented this reduction. There were increased numbers of fibroblasts, leukocytes, and macrophages in the B group, as well as increased lipid peroxidation, which was observed only in this group. Conclusion: B promoted a reduction in the alveolar density area, thereby inducing the inflammatory process and increasing the production of free radicals. These effects were minimized by the application of TEDS at the initial treatment stage.

Keywords
Physical therapy, electric stimulation, diaphragm, bleomycin, pulmonary fibrosis.