

Original Paper

## Effect of doxorubicin on Bcl2 and Bax expression in Rat heart

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### Abstract

**Background and Objective:** The anthracyclin drug doxorubicin (Adriamycin) is one of the most effective antineoplastic agents, and widely used to treat a number of malignancies. However, its use has been restricted due to the dose-dependent cardiotoxicity. The mechanisms of Doxorubicin - induced cardiotoxicity is not entirely clear. This study investigates the effect of Doxorubicin on Bcl2 and Bax genes expression as key molecules that involve in intrinsic pathway of apoptosis in rat heart.

**Materials and Methods:** In this experimental study Doxorubicin administration, male Wistar rats were exposed to intraperitoneal injections (2.5 mg/kg, six times for 2 weeks, n=20). Animals were randomly assigned to the healthy untreated control (n=10) and to the Doxorubicin treatment groups (n=10). Three weeks after completion of treatment myocardial fibrosis, Bcl2 and Bax genes expression were investigated by Masson's trichrome staining and Real Time- PCR analysis respectively. Statistical analysis was performed using the SPSS-16 and independent samples t-test, Mann-Whitney and Kaplan-Meyer method.

**Results:** Masson's trichrome staining showed that Doxorubicin increased fibrosis in the cardiac muscle ( $16.4 \pm 1$ ) in compare to control group ( $1 \pm 0.79$ ). Real Time- PCR analysis showed that Doxorubicin decreased Bcl2 expression levels ( $0.1 \pm 0.07$ ) and increased Bax expression levels ( $2.1 \pm 0.1$ ) in the myocardium in compare to control group ( $P < 0.01$ ).

**Conclusion:** This study showed that administration of Doxorubicin increase interstitial fibrosis of myocardium and Bax expression levels and decrease Bcl2 expression that are the key genes of mitochondria-dependent apoptotic pathway.

**Keywords:** Doxorubicin, Cardiotoxicity, Myocardium, Fibrosis, Apoptosis, Bcl2, Bax

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