

Histopathologic Effects of Sulfur Dioxide in Mouse Liver Following the Chronic and Acute Exposure

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Abstract: The present study examined the histopathologic effects of this gas on the mouse liver in acute and chronic exposure. Twenty eight male mice were divided into 4 groups. Group 1 (G1) as control (not exposed to gas), group 2 (G2) were exposed to high dose of (100 ppm) and group 3 (G3) and group 4 (G4) were exposed to low dose of sulfur dioxide for 5 min for 1 and 3 weeks (20 ppm). Finally the mice were sacrificed and liver were assessed macroscopically and then the biopsy of the liver were assessed microscopically. The data were analyzed statistically. The results showed that the mean number of kupffer cells in G2, G3 and G4 significantly increased (9 ± 1.0 , 10 ± 1.0 , 11 ± 1.2 vs 7 ± 1.4 and $p<0.0001$). Qualitative observations also showed significantly increase in the rate of liver cell necrosis and deformation of hepatic cords and sinusoids with an increase of inflammatory reactions in experimental mice. Present study was indicated that the liver can be damaged by the chronic and acute exposure of sulfur dioxide.

Key words: Sulfur dioxide, mouse, liver

INTRODUCTION

Rapid growth and development of cities created various bio-environmental problems for inhabitants. One of the most important problems of living in big cities in present and future for small cities is pollution.

Air pollution is a permanent and serious threat for cities and leads to dangerous effects on health and society health and cause considerable economic suffers (Zhang *et al.*, 2007).

Given the statics and data use of fossil fuel had an ascending growth in transport and to the same extant is the growth of the various pollutant in the air.

In 2000 transport section played important great role in pollution and had spread to 60.2% Azot oxides, 22% Sulfur dioxide, 98.3% Carbon mono oxide, 90% Hydrocarbons and 75% dust.

Sulfur dioxide (SO₂) is one of pollutant of the city air that in low density in city air and in high density in industrial environments was found (Qin and Meng, 2006; Bai and Meng, 2005; Meng and Liu, 2007).

In 1992 international cancer research agency classified SO₂ to be one of carcinogen materials (Pesatori *et al.*, 2006).

Pollution produced by fossil fuel rich with sulfur increase the death rate especially death of inspiratory and cardiovascular disease (Hedley *et al.*, 2002).

Exposure to high amount of SO₂ is dangerous. Exposure to gas with the density of 100 ppm threat the health. Exposure to air pollutant may cause irreversible changes in activity of inspiratory system and dose effected with asthma are more in danger (Islam and Oberbarnsheidt, 1994).

Apart from cases above, effect of other synthetics of SO₂ like sulfite and sulfate on hypo cay neurons has been studied and results revealed that SO₂ synthetics cause increase of irritability of theses neurons (Du and Meng, 2004).

Exposure to SO₂ cause chronic disorder and change of activity of lungs. Although air pollutant enter the body by inspiratory system and the major effect of them is on lungs but other organs harm, too. Disease of cardiovascular (Pope *et al.*, 2003), lung cancer (Zhang *et al.*, 2007; Matsumoto *et al.*, 2007) especially in women (Hwang *et al.*, 2007; Soll-Johanning *et al.*, 1998), kidney and bladder pharynx and larynx (Soll-Johanning *et al.*, 1998), gaster and prostate (Berndt, 1977), skin and rectum even in some cases liver (Soll-Johanning *et al.*, 1998), decrease of body abilities,