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Title: Fire smoke inhalation and bronchial hyperresponsiveness

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Body: Background: Fire smoke affects direct or indirect injury on airway because it has many harmful dusts to humans. Clinically, it is very similar to bronchial asthma. It is well known that airway reactivity increased in the early phase of smoke inhalation, however, it remains relationship between smoke inhalation and bronchial hyperresponsiveness. Methods; Smoke inhalation injury was diagnosed by initial arterial carboxyhemoglobin (COHb) more than 5% or by bronchoscopy. The grade of inhalation injury was classified as follows; normal, mild, moderate and severe. Its lung parenchymal involvement was assessed by high resolution computer tomography (HRCT). We performed mannitol challenge test (AridolTM) to identify bronchial hyperresponsiveness and considered positive as FEV1 decreased more than 15% of basal FEV1 or more than 10% than previous FEV1, during the test. Results: 15 patients (male 5, female 10) were enrolled consecutively. Initial COHb concentrations and PaO2/FiO2 ratio were 14.8±18.49% and 425.7±123.68, respectively. Bronchoscopic grades for inhalation injury as follows: normal, 3; mild, 9; moderate, 3; severe, none. Of 7 who performed HRCT, 4 showed abnormal radiographic opacities. Post-bronchodilator FVC, FEV1, FEV1/FVC, FEF25-75% and Dlco were 76.00±24.27%, 79.80±27.42%, 80.05±10.01%, 76.40±36.70% and 92.44±22.64%, of predicted values, respectively. Aridol test was performed on 4th day (median; 2-20 days) since the onset of fire and showed all negative results. Conclusions; Fire smoke seems not to cause bronchial hyperresponsiveness in the early phase of smoke inhalation, however, it is required large scaled study to verify its relationship.