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COMPARISON OF ACUTE SMOKE INHALATION IN NON-FIREMEN AND IN FIREMEN. L.J. Faling, and E.B. Weiss. Boston Veterans Administration Medical Center and Tufts University School of Medicine, Boston, MA. and St. Vincent's Hospital, Worcester, MA.

Little information exists comparing acute smoke inhalation (ASI) in non-firemen (NF) and firemen (F). We reviewed data in 51 NF and 46 F without significant cutaneous burns admitted to the Boston City Hospital over a 7 year period. Except for 6 NF, all patients were males; NF were significantly older ( $50.8 \pm 17.5$  vs  $40.3 \pm 9.9$  years;  $p < 0.01$ ) and had a higher incidence of underlying chronic productive cough (45% vs 14%;  $p < 0.01$ ). Smoke exposure occurred within an enclosed space in all but 5 patients and was considered to be longer in NF with 85% requiring rescue and 49% unconscious at the fire scene as compared to a need for rescue in 29% of F ( $p < 0.001$ ) and unconsciousness in 19% ( $p < 0.01$ ). Nevertheless, admission carbon monoxide levels were similar in the 20 NF and 13 F in whom measurements were made ( $14.4 \pm 14.9\%$  saturation vs  $16.4 \pm 16.9$ ;  $p > 0.1$ ). NF were noted on admission to have a more rapid respiratory rate ( $23.5 \pm 8.0$  per minute vs  $19.6 \pm 3.9$ ;  $p < 0.01$ ) as well as more frequent abnormalities on chest auscultation ( $p < 0.05$ ), infiltrates on chest film ( $p < 0.01$ ) and both arrhythmias ( $p < 0.05$ ) and ST-T wave changes ( $p < 0.01$ ) on EKG. Admission arterial blood gases showed pH values  $< 7.35$  in 14 of 48 NF but in only 1 of 46 F ( $p < 0.001$ ); the acidemia in the 1 F and in 10 of the 14 NF was associated with  $HCO_3$  values  $< 20$  mEq/L. Mean  $PaO_2$  breathing air was  $66.0 \pm 17.0$  mmHg in 39 NF and was  $75.7 \pm 11.5$  in 38 F ( $p < 0.01$ ). Severe hypoxemia ( $paO_2 < 50$  mmHg) during hospitalization was seen only in 14 NF. In contrast to an uneventful clinical course in all F, 8 NF required intubation and mechanical ventilation for respiratory failure ( $p < 0.05$ ) and 22 developed acute bronchitis or pneumonia requiring antibiotics ( $p < 0.001$ ). Our only death was a NF. Mean duration of hospitalization was  $7.5 \pm 9.2$  days for NF and  $1.3 \pm 0.7$  days for F ( $p < 0.01$ ). We conclude that ASI in our NF was frequently more severe and associated with greater short-term sequelae than in F. This, in part, may be explained by the longer exposure period and a higher incidence of underlying lung disease in the NF group.

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ACUTE SMOKE INHALATION: CLINICAL AND BLOOD GAS PROFILE

By L. J. Faling, M.D. (Research Associate, Lung Station (Tufts), Boston City Hospital, 818 Harrison Avenue, Boston, Massachusetts) and E. B. Weiss, M.D. (Director, Pulmonary Unit, St. Vincents Hospital, Worcester, Massachusetts)

Forty-eight hospitalized non-firemen were evaluated following acute smoke inhalation. 90% were males, 79% were smokers and chronic obstructive lung disease (C.O.L.D.) was implicated in 48% of the cases. Hospitalization averaged 7 days and mortality was 2%.

Important epidemiologic factors included duration and type of exposure. Major presenting symptoms were dyspnea, cough, sputum, chest pain and upper respiratory tract complaints. Delayed symptoms occurred in only two patients, although clinical deterioration during hospitalization developed in additional cases. Initial physical findings revealed minimal skin burns (21%), eye and/or upper respiratory tract injury (44%), chest auscultatory abnormalities (88%) and unconsciousness (35%).

Laboratory findings included initial leukocytosis ( $>10,000$ ) in 42%, hypokalemia ( $K < 4$  meq/L) in 54% and serum SGOT and/or LDH elevation in 62%. Mean carbon monoxide (16 cases) was 12.6%. Acute EKG abnormalities (arrhythmias, ST-T wave changes) were present in 56%, and reverted to normal in most instances. Chest radiographs demonstrated acute changes in 33% of the cases.

Arterial gases were obtained in all patients with serial studies in 69%. Two groups were defined as follows. Group I, consisting of 33 patients breathing 21%  $O_2$ , had a mean  $paO_2$  of 68.9 mm. Hg, mean  $paCO_2$  of 36.6 mm. Hg, mean  $pH_a$  of 7.41 and mean  $HCO_3^-$  of 22 meq/L. Acidosis ( $pH < 7.35$ ) was present in six patients (18%) - 3 metabolic, 2 respiratory and 1 mixed respiratory and metabolic. Group II, consisting of 11 patients breathing  $> 21\% O_2$ , had a mean  $paO_2$  of 119 mm. Hg, mean  $paCO_2$  of 34.7 mm. Hg, mean  $pH$  7.27 and mean  $HCO_3^-$  of 16.4 meq/L. Acidosis ( $pH < 7.35$ ) was present in seven patients (64%); metabolic acidosis in six and mixed respiratory-metabolic in one. For both groups, respiratory acidosis was associated with C.O.L.D. while metabolic acidosis correlated best with unconsciousness. Further changes of arterial gases in both groups will be detailed and their course illustrated. (Initial Presentation)

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