Pulmonary Function Tests and Granulocytes Functional Activity in Certain Obstructive and Restrictive Lung Diseases.

A Thesis

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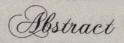Degree of Master of Science in Biology
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Abstract

In this work, an attempt has been made to show the probable interaction between the respiratory disorders and granulocytes functional activity in two groups; hazardous exposed subjects in the factories (in a number of 380 males and 44 females) and non-exposed group (69 males and 69 females). Each group is then subdivided into three subgroups; asthmatics, healthy smokers and healthy non-smokers. The main pulmonary function tests were applied to each subgroups as an indicator to the respiratory disorders, while whole blood luminol dependent chemiluminescence technique was used to measure the granulocytes functional activity. Estimated lung age and the prevalence of the two main types of respiratory diseases were also determined.

There are significant differences between the exposed and the non-exposed groups in the granulocytes functional activity (9.85 ± 0.42 Vs 8.20 ± 0.34), between asthmatics and healthy smokers, (15.15 ± 2.1 Vs. 8.47 ± 0.52), and between asthmatic and healthy non-smokers (15.15 ± 2.1 Vs. 9.4 ± 0.59), in the exposed group. That is the PMNs were activated in asthmatics and had more ability to produce reactive oxygen species than healthy subjects. But this difference is not significant in the non-exposed group.

The significant differences in the pulmonary function tests between the exposed group and the non-exposed group, were seen in the $FEV_1\%$ (90.13 ± 0.40 Vs. 87.29 ± 90), the PEF (Lit/min) (399.6 ± 6.28 Vs 359.8 ± 1.00) and the MEF (Lit/min.) (3.82 ± 0.06 Vs 3.50 ± 0.12).

⅏ The prevalence of the restrictive lung diseases was higher than the prevalence of obstructive lung diseases. This difference is more pronounced in the exposed group (40.8% Vs. 2.6%) than in the non-exposed group (28.26% Vs. 7.97%).

⅏ Estimated lung age demonstrated more deterioration among the patients with obstructive lung diseases than among the patients with restrictive lung diseases (95.45± 7.03 Vs 61.66 ±1.192), (90.91 ± 6.20Vs 55.30 ± 3.02) in the exposed group and the non-exposed group respectively.

There are no correlations between granulocytes functional activity and each of the pulmonary function tests studied in all subgroups. It has, been concluded, that hazardous exposure in the factories employed in this study deteriorates lung function significantly and that determination of granulocytes functional activity may be used as a supplementary tool to highlight the severity of this deterioration.