Correlation of CRP and Serum Level of Fibrinogen with Severity of Disease in Chronic Obstructive Pulmonary Disease Patients

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Background and objectives: Data of a previously published study have shown that Chronic Obstructive Pulmonary Disease (COPD) patients have increased serum levels of CRP and fibrinogen. The aim of this work is to investigate if there was any correlation between inflammation factors and severity of COPD. Design and settings: A case control study conducted on 43 COPD patients and 40 healthy controls. Patients and methods: COPD were selected according to GOLD criteria. Exclusion criteria were acute exacerbation of disease in the past 4 weeks, usage of oral corticosteroids and presence of any comorbidity which could raise level of inflammatory proteins. Control group were healthy individuals. Serum levels of CRP and fibrinogen were measured. Results: The mean serum level of CRP in COPD patients was significantly higher than that of controls (p=0.03). No significant difference was found in the mean serum level of fibrinogen between cases and controls. Also, there were no significant correlation between the serum level of CRP or fibrinogen and severity of the disease and arterial O2 saturation. Conclusion: According to our study results, COPD, per se, can increase serum CRP level. Attenuation of systemic inflammation may offer new perspectives in the management of COPD and its comorbidities. Keywords: CRP, FEV1, fibrinogen.

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3. RESULTS

In this study, 43 COPD patients and 40 healthy controls were evaluated. The mean age of COPD patients was 61.8 (10.1) years (range 32-85 yrs). There were 17 female (39.5%) and 26 male (60.5%). Severity of disease according to the GOLD criteria was mild in 14 cases (32.6%), moderate in 14 cases (32.6%), severe in 12 cases (27.9%) and very severe in 3 patients (7%). Average pack/year was 28.2(14.51); one pts was nonsmoker, 37 current smokers and 7 ex-smokers. Mean concentration of CRP was 23.72 (33.92) mg/L and the mean concentration of fibrinogen was 6.03(2.29) mg/dl (Figure 1, 2). The mean serum level of CRP was 6.31(5.89) mg/L and mean concentration of fibrinogen was 4.14(1.63) mg/dl. Average number of pack/year was 5.94 (9.85) (27 pts were nonsmokers). The mean serum level of CRP in COPD patients was significantly higher than that of healthy controls (p=0.03). However, no significant difference was found in the serum level of fibrinogen between patients and controls (p=0.72).

4. DISCUSSION

According to our study results, the mean serum level of CRP was significantly higher in COPD patients compared to controls which were in accord with previously reported studies (8), but there were no difference among these groups in serum fibrinogen level, despite all studies which confirms correlation between FEVI and increased level of fibrinogen. Therefore, further comparative studies with larger sample sizes are required in this regard. Previous studies have reported that COPD patients have higher systemic fibrinogen levels than healthy control group, regardless smoking (9). These findings fit with a shift of the hemostatic balance to favor the activation of coagulation in COPD. Different studies have suggested this prothrombotic condition to exist in COPD (10). Markers of the hypercoagulation thrombin-antithrombin III complex, fibrinopeptide A, and plasminogen activator inhibitor-1 have been shown to be significantly higher in COPD patients. This shift in the hemostatic balance can be further distorted during acute exacerbations due to increased rate of platelet aggregability as a consequence of acute disturbances in gas exchange (9).

However, elevated serum levels of CRP and fibrinogen were found in GOLD III and IV stadium, which could points that higher airflow obstruction increases these inflammatory markers.

5. CONCLUSION

Our study has shown that serum level of CRP is increased in COPD patients. It is well known that this inflammatory marker cause a systemic inflammatory process and increase the chance of cardiovascular and cerebrovascular accidents, cachexia and osteoporosis.

Therefore, it is recommended to measure the serum level of CRP in COPD patients during their routine clinical visits. These patients should be considered for a more aggressive treatment.

Attenuation of systemic inflammation may offer new perspectives in the management of COPD and its comorbidities.

Conflict of interest: none declared.

REFERENCES