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Title: Inflammatory biomarkers as outcome predictors of acute respiratory failure on top of chronic obstructive pulmonary diseases (COPD)

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Body: The aim of the work is to assess the value of interleukin-6 (IL-6), interleukin-8 (IL-8) and C-reactive protein (CRP) in predicting the outcome of acute respiratory failure (ARF) on top of COPD. Methods: Serum samples were collected from 33 patients with COPD presented with ARF for IL-6, IL-8, and CRP analysis on admission and after 72 hours. Sputum samples were taken for microbiological evaluation. Results: Twenty-five patients (75.8%) survived and 8 patients (24.2%) died during the study. Causative microorganism was detected in 66%. Gram-negative and atypical bacteria were the most common pathogen (31% and 28% resp; single or co-pathogen.) without statistically significant association with the outcome (p= 0.262). The IL-6 on admission was significantly higher (p= 0.03) among the non-survivors (257.1 ± 269.1 pg/ml) vs. the survivors (17.9 ± 25.8 pg/ml). The IL-6 level after 72 hours showed statistical significance (p= 0.03) in predicting the outcome as the highest value was among the non-survivors (24.2%) (IL-6= 98.3±153.6 pg/ml), followed by those discharged on oxygen therapy/continuous positive airway pressure (43%) (IL-6= 39.6±88.1 pg/ml) then those discharged on room air (33%) (IL-6=2.2±8.2 pg/ml). Both the CRP and IL-8 were higher among the non-survivors than survivors without significant difference (p >0.05). The CRP level >2.3 mg/L on admission had the best sensitivity of predicting in-hospital mortality (85.7%) and the IL-6 level > 46.1 pg/ml had the best specificity (83%).Conclusions: High IL-6 is associated with in-hospital mortality. Both CRP and IL-6 levels when are used together, they become good in-hospital mortality predictors.