Studying the effect of bacterial infections on immune state of pneumonia patients at Babylon province

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Abstract: Pneumonia is a common disease that responsible for the mortality and morbidity rate among the world. Immunological parameters potently stimulates both innate and adaptive immune system.In Babylon province there is a little study dealing with the association between bacterial pneumonia and immune state at humoral and cellular levels. The present study aimsto determine the bacterial causative agents of pneumonia in patientswith measurement of some systemic humoral and cellular immune response aspect.

Methods : This study involved 118 patients suffering from pneumonia.Sputum specimens were collected aseptically, then stained with acid fast stain and gram stain to detect the bacterial isolates. Thespecimens were cultured on specific culture media. Antibiotic susceptibility test was done for bacterial isolates according to CLSI and we measured the growth inhibition zones in millimeters.

The patients were classified into nine groups according to the types of bacterial isolates, then blood samples were collected from them to measure the concentrations of IgG, IgA, IgM, C3 and C4 using single radial immunodiffusion assaywith performed the Capillary Migration Inhibition test. In addition to assay the concentrations of IL-6 using ELISA kit.

Results : The results showed the sputum gram stain revealed the presence of neutrophils in 63 specimens from a total of 118 specimens (53.4%) while Ziehl-neelsen stain revealed *Mycobacterium tuberculosis* in 4 specimens with (3.4%). The common bacterial isolate were *Streptococcus pneumoniae* with rate (33.30 %), followed by *Staphylococcus aureus* with rate (14.30%), 8 cases (12.70%) for each one of *Klebsiella pneumonia* and *Burkholderiacepacia*, and 5 cases (7.90%) for each one of *Escherichia coli* and *Streptococcus pyogenes*, 3 cases (4.80%) for *Acinetobacter spp.* and 2 cases (3.20%) for each one of *Pseudomonas aeruginosa* and *Haemophillusinfluenzae*. The occurrence of pneumonia increased in patients aged between 47-62 years about 27 cases (42.9%), also it was increased in male rather than female 36 cases (57%). G^+ and G^- organisms showed susceptibility and resistant to different types of antibiotic that used in this study. The immunological parameters showed a significant increased ($p \leq 0.05$) in the concentrations of IgG, IgA, IgM, C3 and C4 with LIF and IL-6 at systemic humoral and cellular levels respectively compared with healthy control groups.

Conclusions: We can conclude that *Streptococcus pneumoniae*was the most dominantbacterial isolates in causing pneumonia and the best antibiotic that used for treating the infections were Imipenem and Trimethoprim-Sulfamethoxazole with significant increased ($p \leq 0.05$) in all immunological parameters that used in this study.

Key words : Pneumonia; Streptococcus pneumoniae; Antibiotic susceptibility; Immune state.