Discussion

The acute phase protein, CRP, when elevated, provides good evidence of an active tissue-damaging process. Thus; its measurement provides a simple screening test for active organic disease. Increased CRP production is a very early and sensitive response to most forms of bacterial infection [(11)]. Studies have shown that it can be a useful indicator in differentiating between bacterial meningitis and viral meningitis [(13)], CRP levels also have been previously found to be of value in discriminating between bacterial and viral pneumonia [(30)].

In one study by Nel et al [(31)] showed a significantly increased level of CRP during infective exacerbations in emphysema. However, there has not been any assessment of the value of CRP in exacerbations of COPD, which is one of the commonest causes of hospital admissions. In this context, routine bacteriological analysis of sputum is often unreliable and slow. It is well established that the respiratory tract may be asymptomatically colonized; for example *Haemophilus influenzae* in chronic bronchitis [(32,33)]. Thus it may be difficult to distinguish active infection from colonization on the basis of sputum culture. In this situation, serial CRP assays which are cheap, sensitive and rapid to perform provide a useful quantitative measure of exacerbation in COPD.

There have been few studies to assess the value of measuring CRP in clinical exacerbations of COPD. Our study results were compatible with the study by Dev et al [(34)] in whom two group of patients have exacerbation of COPD, one with proven bacterial infection (by sputum culture – group I) and the other in which there is no bacterial cause of infection (group II). The results of our study showed that in both of these groups who had exacerbations of COPD; there was an elevated CRP at the time of admission to the hospital. In group II, clinical improvement occurs following treatment during their hospital stay with an associated dramatic fall in their CRP levels. This is attributed to the following reasons:

1. Inadequate improper sputum sampling
2. Problems with the analysis of sputum
3. Unusual behavior of the strain
4. viral infection could be responsible pathogen in patients in whom sputum was negative for bacterial pathogens

On the other hand, some patients may be chronically colonized with potential bacterial pathogens. Therefore, microbial examination of sputum may not always be useful indicator of active infectious state.

Consequently, since both groups of patients with clinical exacerbations have their CRP levels elevated initially show clinical improvement with lowering of CRP levels after treatment, there is strong probability that CRP is a marker of an exacerbation of COPD, but not necessarily a marker of bacterial infection.

The fall in CRP level after treatment with the clinical improvement could be due to:

1. The antibiotics used to treat the bacterial infection
2. Several other factors such as steroid treatment, O_2 therapy, bronchodilator and other treatments used in the treatment of COPD exacerbations

However, twelve of patients from the culture-negative group did not show a rise in CRP levels despite the evidence of acute exacerbations (group III). These patients may have viral infection that does not cause a rise in CRP or several other physiological defects interfering with CRP response.

Since patients with acute exacerbations of COPD had their CRP levels elevated initially and had clinical improvement with lowering