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## VALUE OF THE PCP STAIN ADDING TO THE CHEST X-RAY FOR THE DIAGNOSIS OF PNEUMOCYSTIS CARINII PNEUMONIA IN HIV SEROPOSITIVE PATIENTS

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### ABSTRACT

Since the PCP is mainly diagnosed based on the clinical history and symptoms, therefore, there is a need to develop the accurate diagnostic test. Indeed, the most accurate test for PCP is the finding of the organism in the lung biopsy or bronchoalveolar lavage but these two methods are invasive. In this study, we tried to assess the value of the sputum PCP stain in the diagnosis of the disease. The stain can be done together with the sputum AFB test. Since the PCP stain is not invasive and may be a new diagnostic test, therefore, we have performed this study. Of the total 20 HIV seropositive patients (13 males and 7 females) in this study, all showed the pattern of interstitial pneumonia without any sputum AFB positive specimen. The result of special stain (Giemsa) of their sputum for PCP in all cases were also negative. According to our study, the chest X ray combining with sputum positive for AFB can provide predictable rate of 100% while the sputum PCP stain provide predictable rate equal to 0%. So the addition of sputum PCP stain to the Chest X ray with sputum AFB stain did not increase any predictive value to the diagnosis.

### INTRODUCTION

Pneumocystis carinii is a poorly understood organism capable of infecting many mammalian species including man and several laboratory animals. Clinical disease is generally restricted to immunocompromised hosts, in which a potentially lethal pneumonia may occur.<sup>1</sup> This infection becomes a common opportunistic infection among the HIV infected patients.<sup>2</sup> Although knowledge about the biology of *P. carinii* has increased in the last ten years, the epidemiology and physiopathology of *P. carinii* pneumonia remain poorly understood.

Due the increase of HIV infected patients, laboratories are receiving increasing numbers of requests for the diagnosis of *P. carinii*. Up to 60% of HIV infected patients with respiratory

complaints are believed to have this infection.<sup>2</sup> A proper diagnosis of this infection is important because the successful use of specific chemotherapy is available. Since this organism cannot be cultivated in vitro, and reliable serological tests are not available,<sup>3-4</sup> the final diagnosis of infection can be established only by demonstration of the organism in bronchoalveolar lavage (BAL) or pulmonary tissue.<sup>5</sup> Various staining methods have been developed to serve this purpose.<sup>6-8</sup>

However, the BAL fluid is difficult to be collected. The easier method to collect respiratory tract specimen is sputum. Here, we perform a study to assess the possibility of the sputum stain for PCP as a diagnostic tool.

## MATERIALS AND METHODS

This study was performed by retrospective study of the patients' record. We reviewed the laboratory results of 20 HIV seropositive patients who visited the out patient clinic of King Chulalongkorn Memorial Hospital with the final diagnosis of pneumocystis carinii pneumonia (PCP), which is made by the clinical improvement by specific drug treatment for PCP (better respiratory symptom and clearer chest X - ray).

## RESULTS

Of the total 20 HIV seropositive patients (13 males and 7 females) in this study, all showed the pattern of interstitial pneumonia without the finding of any sputum AFB positive specimen. The result of special stain (Giemsa) of their sputum for PCP in all cases were negative. All cases were treated with the cotrimoxazole regimen and were improved.

According to our study, the chest X ray combining with negative sputum AFB stain can provide predictable rate up to 100% while the sputum PCP stain provide predictable rate equal to 0%. The additional predictive rate of after the addition of sputum PCP stain to the Chest X ray with sputum AFB staining is 0%.

## DISCUSSION

Since the PCP is mainly diagnosed based on the clinical history and symptoms,<sup>2-4</sup> therefore, there is a need to develop the accurate diagnostic test. Indeed, the most accurate test for PCP is the finding of the organism in the lung biopsy or bronchoalveolar lavage<sup>5</sup> but these two methods are invasive. In this study, we tried to assess the value of the sputum PCP stain in the diagnosis of the disease. The stain can be done altogether with the sputum AFB test. Since the PCP staining of the collected sputum is not

invasive and may prove to be a new diagnostic test, therefore, we performed this study.

According to the study, the Chest X ray with the sputum AFB test can provide a favorable diagnostic value. The necessity of the sputum AFB test in case of the interstitial pneumonia pattern in chest X - ray in the HIV seropositive is confirmed. However, the very bad diagnostic value of the sputum with PCP staining was detected in this study. The possible explanation for this finding is that 1) the staining of the PCP require an expert and the slide interpretation of the PCP require an expert as well, 2) the low detection rate was according to the few subjects in our study and 3) the staining of the sputum is totally useless since the PCP mainly embeds in the alveolar membranes.

Therefore, the staining of the sputum of the PCP patient is not recommended as an additional test. The clinical diagnostic combining with the sputum AFB test to rule out the tuberculosis is still the favorable diagnostic test for PCP in the HIV seropositive patients.

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