PNEUMOCYSTIS PNEUMONIA AMONG HIV PATIENTS IN MALAYSIA

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Abstract. Pneumocystis pneumonia (PCP) has become the most common opportunistic infection in HIV/AIDS patients with a CD4 count ≤200. The incidence of PCP has declined as a result of prophylaxis and better highly active antiretroviral therapy (HAART). The objective of this study was to review the demographic data of HIV patients diagnosed clinically as having PCP at the Hospital Raja Perempuan Zainab II (HRPZ II) in Malaysia. This was a prospective study. All HIV patients admitted to HRPZ II with respiratory symptoms were enrolled in this study after giving informed consent. Their demographic data were collected. The total number of HIV patients reviewed in this study was 107. Nearly 60% of patients were clinically diagnosed as having pneumocystis pneumonia based on their signs, symptoms and chest x-ray findings. A CD4 count was available in 83 out of 107 patients. The fifty-three percent of patients(44) had a CD4<200 and were clinically diagnosed as having pneumocystis pneumonia. Thirty percent had a CD4<200 but did not have clinical pneumocystis pneumonia. Sixteen point nine percent had a CD4>200 and had clinical pneumocystis pneumonia, three of whom had received HAART, four patients had received prophylaxis. Overall, 94 patients (87.8%) received prophylaxis for pneumocystis pneumonia. Thirty-three patients (30.8%) received HAART. The occurrence of pneumocystis pneumonia was common before full implementation of HAART. Pneumocystis pneumonia can occur in patients with a CD4 >200.

INTRODUCTION

Pneumocystis carinii, now called *Pneumocystis jeroveci* (Stringer *et al*, 2002) is an opportunistic fungus known to cause pneumonia (pneumocystis pneumonia) mainly in HIV/AIDS patients and other immunocompromised patients (Wakefield, 2002). In HIV/AIDS patients *Pneumocystis jeroveci* has become the most common opportunistic infection in those patients with a CD4<200 (Ruffini and Madhi, 2002). The prevalence among HIV patients is about 5 to 20%. The incidence of pneumocystis pneumonia has declined in developed countries due to prophylaxis and HAART, but in developing countries, such as Malaysia, the disease is still a problem. Pneumocystis pneumonia is currently diagnosed by the clinical condition of the patient, chest x-ray findings and oxygen saturation. *P. jeroveci* is

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an extracellular organism usually found in the alveolar spaces of the lungs and rarely in extrapulmonary sites.

Diagnosis is difficult because the organism is nonculturable. Microscopy requires an expert and the results depend on the quality of the samples. Pneumocystis pneumonia may cause only subtle clinical signs and symptoms making the diagnosis difficult (Curtis *et al*, 1995). The incidence of pneumocystis pneumonia has declined since the introduction of HAART (Barry and Johnson, 2001). However, opportunistic infection still occurs in some patients on HAART (Kirk *et al*, 2000; Maschke *et al*, 2000). The objective of this study was to review the demographic data of HIV patients in Malaysia with suspected pneumocystic pneumonia before full implementation of HAART in Malaysia.

MATERIALS AND METHODS

This prospective study evaluated 107 HIV patients admitted to the adult ward of Hospital Raja Perempuan Zainab II (HRPZ II), Malaysia. The hospital serves as referral center for the treatment of AIDS in East Coast Malaysia. Inclusion criteria included adult HIV positive patients older than age 18 years with or without respiratory symptoms. Exclusion criteria include children under age 18 and non-HIV patients.

A clinical diagnosis of pneumocystis pneumonia was made by an infectious disease physician based on the criteria of HIV positivity with fever and cough with or without dyspnea and typical radiological chest x-ray findings. Patients were asked whether they had received antiviral therapy, medication for pneumocystis pneumonia prophylaxis (Bactrim or Pentamidine nebulizer), or had any previous admissions for chest infection. CD4 counts were recorded.

RESULTS

Demographic data of the patients are shown in Table 1. The total number of HIV patients reviewed in this study was 107. Nearly 60% of patients were clinically diagnosed as having pneumocystis pneumonia based on their signs, symptoms, and chest x-ray findings. CD4 counts were available for 83 of 107 patients. Of these 53.0% (44) had a CD4<200 and were diagnosed as having pneumocystis pneumonitis. Thirty-six percent (25) had a CD4<200, but did not have clinical pneumocystis pneumonitis. Sixteen point nine percent (14) had a CD4>200 but were diagnosed clinically as having pneumocystis pneumonia. Three of these had received HAART and four patients had not received HAART but did receive prophylaxis. In total, 74 patients (87.8%) received prophylaxis against pneumocystis pneumonia. Twelve point two percent of patients did not receive prophylaxis. Thirty-three patients (30.8%) received HAART; the remainder did not receive any medication. Seven patients with a CD4 <200 were diagnosed as having pneumocystis pneumonia.

DISCUSSION

Patients with HIV/AIDS are at risk of developing many complications. Pneumocystis pneumonia is an important complication (opportunistic infection) in AIDS patients. Hanvanich *et al* (2001)studied the prevalence of opportunistic infections in 155 patients in Thailand and found pneumocystis pneumonia was the second most common complication after tuberculosis with a prevalence of 30%. A study during the preHAART era found 36.3% of patients had pneumocystis pneumonia (Armand *et al*, 2001; cited in Wolff and O'Donnell, 2001). In our study pneumocystis pneumonia was found in nearly 60% of the

Table 1
Characteristics of 107 pneumocystis pneumonia patients

Variables	Pneumocystis pneumonia		Total	χ^2	*p*-value
	Yes, *n* (%)	No, *n* (%)	*n*, (%)		
Gender					
Female	15 (68.2)	7 (31.8)	22 (20.6)	0.807	[a]0.369
Male	49 (57.6)	36 (42.4)	85 (79.4)		
Race					
Malay	58 (60.4)	38 (39.6)	96 (89.7)		[b]0.753
Non-Malay	6 (54.5)	5 (45.5)	11 (10.3)		
CD4					
<200	44 (53.0)	25 (36.2)	69 (83.1)	0.931	[a]0.335
>200	7 (50.0)	7 (50.0)	14 (16.9)		
Medication					
No	43 (58.1)	31 (41.9)	74 (75.5)	0.290	[a]0.590
Yes	21 (63.6)	12 (36.4)	24 (24.5)		

[a] Chi-square test; [b] Fisher's exact test

study population.

Our demographic data showed the majority of patients were male and belonged to the Malay race (Table 1). This is because in Malaysia, the most common HIV cases are in intravenous drug users and Malays were the population with the highest incidence of drug abuse. They contributed to 73.8% of cases (Ministry of Health Malaysia, 2004). The majority of women acquired HIV infection through their husbands (many couples, especially in rural areas, did not practice safe sex).

The majority of patients with pneumocystis pneumonia had pneumocystis pneumonia prophylaxis instituted before hospital admission. However, 12.2% did not receive it. Patients coming to the hospital during late stages, who have poor compliance with medication and those on HAART are common reasons why many did not receive prophylaxis. Breakthrough pneumocystis pneumonia infection in this group may be explained by irregularities in taking medication for prophylaxis.

CD4 count is a strong predictor of pneumocystis pneumonia. The majority of patient (53.0%) diagnosed with pneumocystis pneumonia had a CD4 <200 (Table 1). However, there were 3 patients with a CD4>200 already on HAART. Their pneumocystis pneumonia could not be due to immune reconstitution syndromes (IRS). In this syndrome, patients responding to HAART have a recrudescence of diseases that have become dormant or develop new inflammatory types disease (Foudraine *et al*, 1999; Kunimoto *et al*, 1999; DeSimone *et al*, 2000). This contributes to about 2.8% of the total patients diagnosed as having clinical pneumocystis pneumonia.

HAART is the best approach to prevent opportunistic infections and should be considered for all HIV patients who qualify for such therapy (CDC, 2006). HAART therapy was introduced in Malaysia in 1998. The cost

of HAART is subsidized by the government. HAART therapy was not given to all HIV patients even though they fulfilled the criteria, mainly due to economic factors. Government servants, pregnant mothers and children get the therapy for free, whereas others had to pay for one drug and the other two drugs were free. This is the reason why percent of patients receiving HAART was low. Other reasons were the problems of poor compliance, inadequate economic support to maintain the cost of the drugs and severity of the opportunistic infection.

There were limitations in our study. Some of our data were incomplete because the patient presented during a critical stage of their illness and we were not able to obtain full data from them. Verification of clinical diagnosis was limited. We could not determine the relationship between pneumocystis pneumonia and HAART because most of our population was not on full HAART treatment.

In conclusion, pneumocystis pneumonia is the most important opportunistic infection in HIV patients. HAART can reduce the incidence of pneumocystis pneumonia. Patients should be educated to come to the hospital early and obtain proper treatment. The government should provide free medication to each HIV patient (especially poor patients).

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