Pattern of AIDS-defining illness and mortality in the era of highly active antiretroviral therapy

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Background

Worldwide, HIV/AIDS morbidity and mortality declined shortly after the advent of highly active antiretroviral therapy (HAART). Similar improvement in the prognosis of HIV/AIDS patients in Hong Kong has been reported. We studied if the impact of HAART was sustained locally since its availability in 1997.

Methods

The outcomes of patients under care at the government HIV clinic are tracked by a clinical information system (CIS). Data on AIDS-defining illnesses (ADI) and death were extracted from the CIS. The study period was from 1999 to 2003.

Results

As shown in Table 1, the number of active patients under follow up at end of year were: 368 (1999), 423 (2000), 495 (2001), 605 (2002) and 698 (2003). Annual occurrence of ADI (episodes per 100 active patients) was: 8.7, 9.5, 7.7, 9.3 and 7.6. Fifty to eight-four percent of which were primary ADI.

Table 2 shows that *Pneumocystis jirovechi* (26-55%) pneumonia and tuberculosis (29-56%) were the commonest primary ADIs each year. A majority of the first AIDS events occurred at a low CD4, with 30-80% less than 50/ul and some 75-95% less than 100/ul. Fungal infections (penicilliosis, cryptococcosis and candidiasis) and cytomegalovirus diseases were the commonest subsequent ADI.

Table 3 shows the mortality pattern observed in the cohort. There were 5-10 deaths per year, giving a ratio of 0.83-2.02% against number of active patients. Some 29-57% of the deaths occurred in non-AIDS patients.

Table 1. Prevalence of AIDS-defining illnesses and time lag of first events from HIV diagnoses.

	1999	2000	2001	2002	2003
No. active patients	368	423	495	605	698
No. (%) of patients with ADI	29 (7.9)	32 (7.6)	36 (7.3)	49 (8.1)	44 (6.3)
Episodes of ADI	32	40	38	56	44
Episodes of ADI/100 patients	8.7	9.5	7.7	9.3	7.6
HIV-AIDS interval - No. (%)					
<=3 months	11 (45.8)	17 (63.0)	14 (56.0)	25 (64.1)	19 (52.8)
>3-6 months	4 (16.7)	1 (4.0)	1 (4.0)	2 (5.1)	4 (11.1)
>6 months	9 (37.5)	9 (33.3)	10 (40.0)	12 (30.8)	13 (36.1)

Table 2. Clinical and immunologic characteristics of primary AIDS-defining illnesses (ADI)

	1999	2000	2001	2002	2003
Primary ADI, No. (% all ADI)	27 (84%)	21 (52.5%)	29 (76.3%)	37 (66.1%)	33 (75%)
Distribution – No. (%)					
• *Pneumocystis jirovechi* pneumonia	7(25.9)	10 (47.6)	16 (55.2)	16 (43.2)	9 (27.3)
• *Mycobacterium tuberculosis*	15 (55.6)	6 (28.6)	10 (34.5)	16 (43.2)	14 (42.4)
• Penicilliosis	1 (3.7)	0	1 (3.4)	2 (5.4)	1 (3.0)
• Other fungal infections	0	1 (4.8)	1 (3.4)	2 (5.4)	4 (12.1)
• Cytomegalovirus diseases	0	1 (4.8)	0	0	1 (3.0)
• Non-TB Mycobacterial infections	0	1 (4.8)	0	0	2 (6.1)
• Kaposi's sarcoma	1 (3.7)	1 (4.8)	0	0	0
• Others	3 (11.1)	1 (4.8)	1 (3.4)	1 (3.4)	2 (6.1)
CD4 (% of cases)					
<50/ul	29	63	81	63	34
50-100/ul	33	11	15	20	31
101-200/ul	21	26	4	17	25

Table 3. Mortality pattern

	1999	2000	2001	2002	2003
No. active patients	368	423	495	605	698
No. of deaths	7	7	10	5	9
AIDS patients - No. (%)	5 (71.4)	3 (42.9)	7 (70)	3 (60)	6 (66.7)
Non-AIDS patients - No. (%)	2 (28.6)	4 (57.1)	3 (30)	2 (40)	3 (33.3)
Mortality ratio - death/active patients	1.90%	2%	2.02%	0.83%	1.29%

Discussions

Occurrence of AIDS-defining illnesses among our patients was uncommon. Dependent on a variety of factors including stage at HIV presentation and compliance with care and treatment, annually less than 10% of active patients at end of a year first progressed to AIDS or developed subsequent ADI. Similarly, there were below 10 episodes of any ADI per 100 patients.

Pneumocystis jirovechi pneumonia and *Mycobacterium tuberculosis* were two equally important primary ADI observed in our clinic, which was in accordance with the territory-wide profile. As expected, most of the patients developed ADI at a low CD4, either because of natural disease progression or treatment failure. In contrast, fungal and cytomegalovirus diseases were the commonest subsequent ADI in our patient population. Death of patients was rare. Notably some deaths occurred in non-AIDS patients, signifying that mortality is not necessarily caused by HIV disease progression in face of effective treatment.

In summary, morbidity and mortality in HIV/AIDS patients still occurred but at low levels six years into the HAART era in Hong Kong, no obvious trend of worsening with time. A sizable proportion of the deaths was in non-AIDS patients. Continual tracking of changes in HIV/AIDS morbidity and mortality is indicated.