



Mortality and morbidity patterns among HIV patients with prognostic markers in a tertiary care hospital in southern India

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RESEARCH

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Abstract

Background

Opportunistic infections are an important cause of morbidity and mortality in persons infected with HIV. In recent years, antiretroviral treatment (ART) and prophylaxis against various other opportunistic infections have contributed to a decrease in AIDS-related mortality. We conducted a study of HIV infected inpatients in our centre to study the various factors contributing to mortality in HIV/AIDS patients and to study the role of antiretroviral drugs in increasing longevity.

Method

We retrospectively reviewed the medical records of HIV/AIDS patients who were admitted to a tertiary care hospital from 1 January 2005 to 28 February 2006. Socio demographic information, CD4 lymphocyte counts (wherever available); diagnoses at discharge, incidence of opportunistic infections in patients and final outcome of the patients were collected.

Results

There was no difference in mean age between the patients

who died and those who are surviving. Body weight was comparatively lower for the patients who died than the survivors. Albumin levels were significantly lower among those who died (0.56 ± 1.29 versus 2.73 ± 1.13). CD4 counts did not predict a worse prognosis. History of fever (76.7% versus 53.17%) and weight loss (56.7% versus 33.33%) predictably pointed to a bad prognosis.

On the brighter side, administration of specific therapy which included Lamivudine was associated with a better outcome (OR - 0.07, $p = 0.004$) than any other combination of ART.

Conclusion

The above findings could be a rough guide for evaluating the status of HIV/AIDS patients who cannot afford frequent medical investigations in developing countries. Moreover as in our study, it was found that CD4 count was not a very reliable marker for the prognosis in such patients. A broader study could be a clue to a more cost-effective and cheaper alternative mode of assessment for HIV/AIDS patients in developing countries where medical facilities are not just unaffordable but also scanty.

Key Words

HIV, Antiretroviral therapy, Survival, Prognostic markers, AIDS

Background

The HIV epidemic is currently in its fourth decade with no sign of abating.¹ Opportunistic infections are an important cause of morbidity and mortality in persons infected with HIV.² In recent years, ART and prophylaxis against various other opportunistic infections have contributed to a decrease in AIDS-related mortality.³ The inpatient admission rate has fallen in our centre with increasing use of ART among HIV positive individuals (Table 1). However, the crude mortality of inpatients has not changed much possibly underlining the importance of the extraneous factors such as opportunistic infections and malignancies.⁴ We conducted a study of HIV infected inpatients in our centre to study the various factors contributing to mortality in HIV/AIDS patients and to study the role of antiretroviral drugs in increasing longevity.



Table 1: Admissions and deaths due to HIV and related causes in our institution during various years

Year	1998	1999	2000	2001
Admissions	68	120	150	195
Deaths	8	7	15	23
Year	2002	2003	2004	2005
Admissions	378	400	247	209
Deaths	35	36	26	28

Method

Ethics committee approval was obtained from the Institutional Ethics Committee, Kasturba Medical College, Mangalore (India) before embarking on the study. We retrospectively reviewed the medical records of HIV/AIDS patients who were admitted to a tertiary care teaching hospital in South India from 1 January 2005 to 28 February 2006. This study duration was randomly selected to avoid any selection bias. The case files of all the patients admitted during this duration in the medical HIV unit were included in the study. We had to restrict the sample size to whatever cases available for the study duration. Sociodemographic information, CD4 lymphocyte counts (wherever available); diagnoses at discharge, incidence of opportunistic infections in patients and final outcome of the patients were collected.⁵ Case dairies of patients were collected (n = 157) until 30 fatal events were available so that meaningful statistical analysis could be conducted between the surviving and dead patients. It has to be commented here that CD4 counts were not available in the case dairies of several patients as the cost of the test was high during that time and many patients could not afford the same.

The patients were classified for analysis purposes as those who were on ART or no ART and further those on ART with Lamivudine and those without. A databank was created in SPSS version 15.0 for windows. A descriptive analysis of the sample was done. The continuous variables were summarised as means and standard deviations. The differences between two groups were subjected to test of hypothesis using student's T-test. Categorical variables were subjected to frequency tabulation and further chi-squared test was carried out to find statistical significance wherever necessary. Odds ratios were calculated to find the association between various factors and death in various groups. Univariate survival analysis using the Kaplan-Meier method was applied to find the differences in survival rates between those on ART and those specifically on Lamivudine containing ART. The value of $p < 0.05$ was defined as the limit for statistical significance.

Results

A total of 157 case files were included in the study. Out of these 40 were female and 117 were males. There were 30 deaths recorded out of the cases during the study duration. Average age of the subjects was 36.28 years and their average weight was 49.47 kg.

There was no difference in mean age between the patients who died (35.13 ± 8.5 years) and those who are surviving (36.56 ± 10.2 years). There were more females (28.57%) among survivors than the deceased (13.3%) though this finding was not statistically significant. Body weight was comparatively lower for the patients who died ($44.89 \text{ kg} \pm 11.09$) than the survivors ($50.56 \text{ kg} \pm 8.34$) in spite of more females being part of the survivors. Serum albumin levels were significantly lower among those who died (0.56 ± 1.29 versus 2.73 ± 1.13) (Table 2)

Table 2: Characteristics of the subjects enrolled in the study

	Died (N=30)	SD	Alive (N=127)	SD	P
Age	35.1	8.50	36.55	10.20	.48
Weight	44.8	11.0	50.56	8.34	.06
CD4	79.5	61.4	138.64	219.3	.29
Albumin	.556	1.28	2.72	1.12	.00
Hb%	10.0	3.40	10.29	1.98	.64

Based on the Student's T Test, haemoglobin ($p = 0.29$) and CD4 counts (wherever available, $p = 0.64$) could not predict a worse prognosis. However it is added that CD4 counts were available for a very limited number of patients and hence analysis associated with them may not be significant. History of fever (76.7% versus 53.17%) and weight loss (56.7% versus 33.33%) predictably pointed to a bad prognosis in terms of mortality (based on the chi square test). Dyspnoea (36.7%) and dysphagia (23.3%) were more common among those who died. Symptoms such as headache (36.7% versus 4.28%) and altered sensorium (16.7% versus 6.1%) indicated a worse prognosis in terms of mortality. Presence of candidiasis (60.0% versus 6.7%) and PCP pneumonia (20% versus 5.56%) called for more vigilance as the patients had a relatively bad prognosis if these diseases were present. On the brighter side, administration of specific therapy which included Lamivudine (Fig.1) was associated with a better outcome (Odds Ratio (OR) - 0.07, $p = 0.004$) than any other combination of ART. As predicted by history, treatment with Amphotericin (OR 6.3, $p = 0.03$) and corticosteroids (OR - 4, $p = 0.006$) pointed towards a bad outcome. (Table 3)

Survival of patients on Lamivudine

compared to those not on Lamivudine

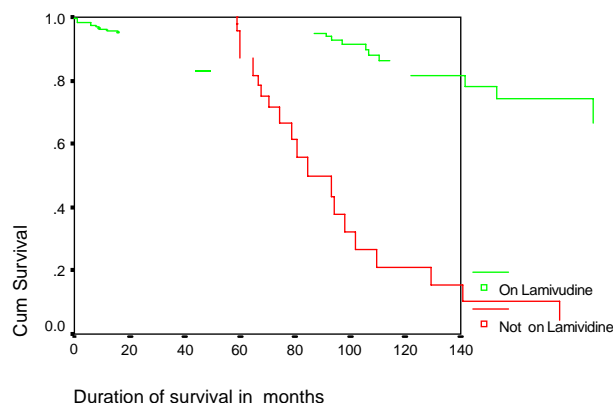


Figure 1: Survival curve of patients on Lamivudine compared to those not on Lamivudine.



The number of patients who died was 30. Causes of death among our patients were AIDS associated infections (n=8), other bacterial infections (n=2), other causes like respiratory failure, encephalopathy etc. (n=5) (Figure 2). Cancers, cardiovascular causes, liver failure and an instance of suicide were other indirect causes. Tuberculosis alone was not a predictor for death as such, although, there were a good number of patients (N=5) who died of tuberculosis complications. Another equally significant finding obtained was the duration of the disease. Eight among 30 deceased were diagnosed less than six months ago.

Table 3. Clinical characteristics of the subjects enrolled in the study

	Died (N=30)	%	Alive (N=127)	%	Odds Ratio	P
Females	4	13.3	36	28.57	0.39	0.14
Anaemia	17	56.7	34	26.98	1.18	0.89
Fever	23	76.7	67	53.17	2.82	0.03
Weight loss	17	56.7	42	33.33	2.62	0.03
Dysphagia	7	23.3	12	9.52	2.89	0.07
Dyspnoea	11	36.7	23	18.25	2.59	0.05
Headache	11	36.7	15	11.90	4.28	0.002
Altered sensorium	5	16.7	4	3.17	6.1	0.0015
Candidiasis	18	60.0	23	18.25	6.71	<0.0001
PCP	6	20.0	7	5.56	4.25	0.03
ART	11	36.7	61	48.41	0.062	0.34
Lamivudine	1	3.3	39	30.95	0.07	0.004
Amphotericin	4	13.3	3	2.38	6.3	0.03
Corticosteroids	10	33.3	14	11.11	4	0.006

Eight pregnant women also were part of the study. Five of them were on Zidovudine prophylaxis and one was given Nevirapine.

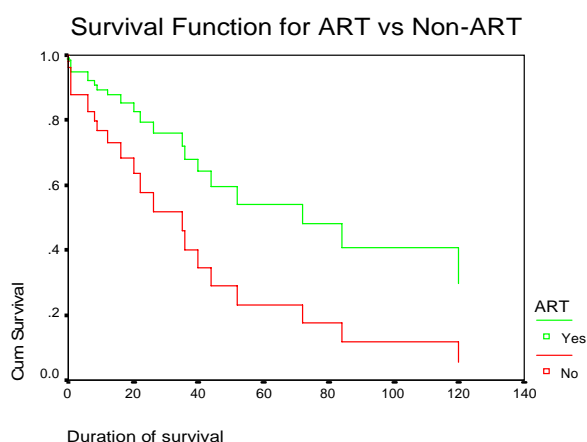


Figure 2: Survival curve of patients on ART versus patients not on ART

Discussion

As there was no difference in mean age between the patients who died and those who are surviving, we tend to conclude that age probably does not have a very strong correlation as far as severity of the disease is concerned.

But since the sample size is small and this was a very short study, we cannot categorically comment upon the same. A higher number of females among survivors indicates that women are relatively healthier and respond better to the antiviral drugs. In our study population it was found that, generally, women had less risk factors and the majority of the women got infected from their HIV-positive husbands. Due to the same reason these women presented to the hospital earlier along with their spouses when the partners developed full blown AIDS (or presented with symptoms), and hence the women were checked for HIV and detected at an earlier stage. Lower body weight of the patients who died compared to the survivors was probably due to cachexia of the disease. Lower serum albumin levels in the deceased also point towards cachexia and decreased liver function. It was interesting to note that haemoglobin and CD4 counts could not predict a worse prognosis and were similar in both the survivors and the deceased. However since CD4 counts were available for a very limited number of patients owing to the high cost of the investigation, no statistical tests could be done based on the same. Fever and weight loss predicted a bad prognosis both due to cachexia as well as opportunistic infections. Higher occurrence of dyspnoea and dysphagia among those who died is indicative of a fungal infection of the lungs and oesophagus. Headache and altered sensorium indicated a worse prognosis, if present in the patient during hospitalisation, probably pointing towards meningitis which had a bad outcome.

ARTs containing Lamivudine were associated with a significantly better outcome than any other combination of ART indicating that perhaps the HIV strains present in this region are more susceptible to this drug (Univariate survival analysis using the Kaplan-Meier method to find the differences in survival rates between those on ART and those specifically on Lamivudine containing ART, Figure 1). Various antiretroviral regimens were in use during that time and all of them were pre Highly Active Anti Retro Viral Therapy (HAART). The purpose of this analysis was to see if any particular medication had significant benefit so that we could propose an affordable HAART (Highly Economical ART or HEART) treatment with Amphotericin and corticosteroids pointed towards a bad outcome not due to the adverse effects of the drugs but due to the conditions they were used to be treated for, like fungal infections etc.

Eight among 30 deceased were diagnosed less than six months ago. It is probably they had approached their physician at such a late stage that ART could not be initiated.

Conclusion

An early diagnosis and timely intervention with ART will give the patient a chance to live longer. Further improvements in availability and access to efficacious and cost-effective therapy of the disease are necessary to improve the patient outcomes.⁶ In addition, prevention strategies, in particular chemoprophylaxis need to be further evaluated while the outcome of initiatives to make ART more widely available is being awaited.



References

1. Crum NF, Riffenburgh RH, Wegner S, Agan BK, Tasker SA, Spooner KM, Armstrong AW, Fraser S, Wallace MR; Triservice AIDS Clinical Consortium. Comparisons of causes of death and mortality rates among HIV-infected persons: analysis of the pre-, early, and late HAART (highly active antiretroviral therapy) eras. *J Acquir Immune Defic Syndr*. 2006;41(2):194-200.
2. Dankner WM, Lindsey JC, Levin MJ. Correlates of opportunistic infections in children infected with the human immunodeficiency virus managed before highly active antiretroviral therapy. *Pediatr Infect Dis J*. 2001;20:40-8.
3. Murphy EL, Collier AC, Kalish LA, Assmann SF, Para MF, Flanigan TP, Kumar PN, Mintz L, Wallach FR, Nemo GJ; Viral Activation Transfusion Study Investigators. Highly active antiretroviral therapy decreases mortality and morbidity in patients with advanced HIV disease. *Ann Intern Med*. 2001;135(1):17-26..
4. Lumbiganon P, Kariminia A, Aurlibul L, Hansudewechakul R, Puthanakit T, Kurniati N, Kumarasamy N, Chokephaibulkit K, Nik Yusoff NK, Vonthanak S, Moy FS, Razali KA, Nallusamy R, Sohn AH; TREAT Asia Pediatric HIV Observational Database (TAPHOD). Survival of HIV-infected children: a cohort study from the Asia-Pacific region. *J Acquir Immune Defic Syndr*. 2011;56(4):365-71.
5. Anekthananon T, Ratanasuwan W, Techasathit W,

Rongrungruang Y, Suwanagool S. HIV infection/acquired immunodeficiency syndrome at Siriraj Hospital, 2002: time for secondary prevention. *J Med Assoc Thai*. 2004;87(2):173-9.

6. French N, Gray K, Watera C, Nakiyingi J, Lugada E, Moore M, Lalloo D, Whitworth JA, Gilks CF. Cryptococcal infection in a cohort of HIV-1-infected Ugandan adults. *AIDS*. 2002;16(7):1031-8.

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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ETHICS COMMITTEE APPROVAL

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