Horizons
Refining the response to HIV/AIDS through global operations research

Adherence to Antiretroviral Therapy and its Principal Determinants in HIV-infected Adults in India

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CONCLUSIONS

- Overall adherence among this group of patients was high.
  Severe depression and obtaining free antiretrovirals (ARVs) were the main predictors of lower adherence.
- Designing interventions to support clients at risk for non-adherence because of depression needs special focus.
- Not paying for ARVs was significantly associated with lower adherence, even after controlling for socioeconomic status.
- Lower adherence among clients in the public sector may be explained by stockouts or a lack of value placed on the medications because they are free. Studies with more patients receiving free ARVs within the national ARV program are required. Provision of free ARVs without adequate adherence support may compromise the success of antiretroviral therapy (ART) scale-up programs.

BACKGROUND

High levels of adherence are required for ART to be effective. There is very little published information on adherence to ART in India among clients of private-sector and public-sector health facilities. A cross sectional study was undertaken in Pune and Delhi to explore existing levels of adherence to therapy among HIV+ persons currently on ART.

METHODOLOGY

310 HIV+ patients currently on ART at one private-sector (mostly paying out-of-pocket) and three public-sector (free ARV medications) hospitals were interviewed between May and August 2004. A semi-structured questionnaire adapted from ACTG adherence instruments was used for data collection. Although formal adherence counseling was not provided at any site, physicians did discuss adherence with patients.

Key themes of analysis

- Adherence to ART.
- Reasons for missed doses.
- Factors influencing adherence, including gender, paying vs. non-paying for medications, SES, and HIV- and ART-related variables.

Adherence was measured using self-report.

- Mean 4-day adherence rate: Calculated by dividing the number of pills actually taken by the number of pills prescribed for 4 days X 100.
- Higher adherence was mean 4-day adherence rate > 90% and lower adherence was < 90%.
- Other measures of adherence included:
  - Missed doses over last week (7 days).
  - Last time missed full day of medication.
  - Number of times treatment was stopped for > 1 week.
  - Frequency of following the medication schedule.

KEY FINDINGS

261 men and 49 women were interviewed. Mean age 37 years (23-70).

Overall, adherence was high in this population. Self-reported mean 4-day adherence for all respondents was 94%. 84% of respondents reported higher adherence (> 90%). Table 1 describes the results for other measures of adherence. There were no significant differences between males and females.

Table 1 Adherence (self-reported) by sex

	Males (n = 261) %	Females (n = 49) %
Missed doses over last week (7 days)*		
No doses missed	80.1	77.6
1 to 2 doses missed	12.3	16.3
3 or more doses missed	7.7	6.1
Last time missed a full day's medication*		
Never	66.3	67.3
In the last 4 weeks	13.4	10.2
Between 1 to 3 months	8.4	12.2
More than 3 months back	11.9	10.2
Number of times treatment stopped for more than 1 week*		
Never	83.1	85.7
Once	10.7	8.2
2 or more times	6.1	6.1
How closely did respondent follow ARV medication schedule*		
Always	73.2	71.4
Most of the time	16.5	4.1
Some of the time	4.6	4.1
Never	5.7	20.4

*Kruskal Wallis Test (non-parametric). No significant differences observed.

Reasons for missed doses over past 7 days

Commonly cited reasons for missing doses over past 7 days included being busy with other things and purely forgetting (38%), being away from home (34%), and running out of pills–including dispensary stockouts (26%).

Not having money to purchase medications, not understanding instructions, and feeling ill were mentioned by a few (3 to 5%).

A high pill burden, side effects, or feeling depressed were cited as reasons by less than 2% of respondents.

"Sometimes I forget, I think the children will bring it and they think that mummy has taken it."
40-year-old female patient

"If medicines are not there they tell us to come back. Once or twice [they] have done so for a week."
32-year-old female patient

"A few days back I had gone to my village place and forgotten the name of medicine so I could not purchase them."
30-year-old male patient

Severe depression and obtaining free ARVs were the main predictors of lower adherence.

On bivariate analysis, less than university education, being unemployed, obtaining free ARV treatment, severe depression, baseline CD4 count > 200/mm3, hospitalization > 2 times, and taking 4 or more medicines were associated with lower adherence. Gender, time since HIV diagnosis, time on ART, knowledge of medication, social support from family, side effects, and SES were not associated with lower adherence.

On multivariate analysis, only obtaining free treatment and severe depression were associated with lower adherence (Table 2). Among patients receiving free ARVs lower adherence was observed on all measures of adherence.

Table 2 Factors influencing adherence

	Unadjusted odds	95% CI	Sig p-value	Adjusted odds	95%CI	Sig p-value
Education						
University ® (n = 115)						
6 – 12 yrs school (n = 165)	2.834	1.296 – 6.195	0.009*	1.918	0.802 – 4.588	0.143
< 5 yrs school (n = 30)	4.282	1.488 – 12.327	0.007*	0.342	0.067 – 1.742	0.196
Employment						
Employed ® (n = 255)						
Unemployed (n = 55)	2.347	1.217 – 4.882	0.012*	2.146	.913 – 5.043	0.080
Coverage						
Paid out of pocket ® (n = 252)						
Obtained free (n = 58)	5.712	2.939 – 11.101	0.000*	3.904	1.485 – 10.261*	0.006*
Depression						
Minimal ® (n = 145)						
Mild (n = 44)	2.536	0.954 – 6.742	0.062	2.179	0.726 – 6.544	0.165
Moderate (n = 54)	2.472	0.963 – 6.350	0.060	1.900	0.659 – 50477	0.235
Severe (n = 61)	6.490	2.887 – 14.592*	0.000*	4.333	1.699 – 11.046*	0.002*
Baseline CD4 (starting ART)						
<100 cells/mm^3 ® (n = 133)						
101 – 200cells/mm^3 (n = 114)	1.388	0.645 – 2.984	0.401	1.260	0.531 – 2.987	0.600
> 200 cells/mm^3 (n = 59)	4.037	1.855 – 8.788*	0.000*	2.467	0.861 – 7.073	0.093
Number of hospitalizations						
Never ® (n = 230)						
Once (n = 58)	0.243	0.329 – 1.868	0.583	0.667	0.245 – 1.819	0.429
> 2 times (n = 16)	1.386	1.427 – 11.210*	0.008*	3.382	0.868 – 13.186	0.079
Medication burden						
1 medication ® (n = 116)						
2 – 3 medications (n = 132)	1.051	0.494 – 2.236	0.897	0.915	0.387 – 2.164	0.839
> 4 medications (n = 56)	3.207	1.444 – 7.120*	0.004*	2.541	0.965 – 6.692	0.059

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Ruby Hall Clinic

Population Council