Research Article

# Study of changes in clinical profile of diatric HIV patients after institution of HAART

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## Abstract

**Introduction:** The clinical manifestations of HIV-infection in children are different from those in adults. Even the pattern of opportunistic infections in children is different from those in adults. Children tend to suffer from primary infection while adults are more likely to suffer from reactivation of infection as their immunity wanes in response to advanced HIV infection. **Aims and Objectives:** to study Effect of institution of HAART on clinical profile of children with HIV. Material and Methods: children with HIV attending ART Centre and paediatric ward of Government Medical College, Latur were observed for changes in clinical profile for one year after instituting HAART. WHO clinical staging criteria for classifying HIV patients was used in the present study.**Results:** Majority of children's i.e.71.81% were in WHO clinical Stage 3 and 4 at start of study. Significant improvement was observed in the health of children after one year of HAART. The incidence of adverse reaction was also very less in the present study. And the compliance for the treatment was good. 73.63% children showed improvement in the health status. Whereas only 17.27% children showed decoration in the health status. **Conclusion:** there was improvement in the clinical profile of children with HIV after one year of HAART.

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## INTRODUCTION

The first case of HIV infection in India was diagnosed among sex workers in Chennai, Tamil Nadu in 1986.[1] India harbors world's second highest number of HIV infected people. HIV infection is increasingly becoming a prominent cause of childhood morbidity and mortality in India. Presently 3.4 million children are living with HIV/AIDS in India at the end of 2011[1]. The global impact of HIV epidemic has been so dramatic and devastating that it has been described as the "epidemic of current century".[3]The clinical manifestations of HIV-infection in children are different from those in adults. The immune system of young children, who are infected perinatally, is immature and hence dissemination throughout the various organs may occur very early. Organs such as the brain may be susceptible to the effects of the virus in a manner different from that observed in adults. Even the pattern of opportunistic infections in children is different from those in adults. Children tend to suffer from primary infection while adults are more likely to suffer from reactivation of infection as their immunity wanes in response to advanced HIV infection.[4]The varied clinical presentation of HIV uninfected children with malnutrition is determined by the complex interactions between specific nutrient deficiencies, infections, and stress within each individual. Decrease in food intake leads to wasting, with associated reduced function of body organs and systems, and an increased susceptibility to environmental perturbations or stress.[3]Early diagnosis is important for timely initiation of ART because it is desirable to start treatment before severe immune deficiency. Infants, if severely immune-compromised at start of therapy,

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experience higher mortality, one of the reasons being development of immune reconstitution inflammatory syndrome (IRIS).[5]There is a complex three-way relationship between malnutrition, the immune system and infection, with malnutrition eliciting immune system dysfunctions, which in turn promote increased vulnerability of the host to infection, and affecting physical health of children. WHO has classified clinical profile according to various signs and symptoms Present study was undertaken to study the effect of HAART on clinical profile of children with HIV.

**AIMS AND OBJECT:** to study Effect of institution of HAART on clinical profile of children with HIV

## MATERIAL AND METHODS

### Study design

The present prospective study was carried out in ART Centre and paediatric ward of Government Medical College, Latur. The study was carried during the period of October 2011 to October 2013.

### Sample Size

All children who were HIV reactive attending ART OPD or IPD during the 1st year of study period (i. e oct 2011 to sept 2012) were included in the study. And in the second year they were followed up for changes in clinical profile. Following inclusion and exclusion criterion was used to select the study subjects.

- **Inclusion Criteria**: age more than 1½ year (18 months) to less than 14 years and who are fulfilling criteria for starting HAART.
- **Exclusion Criteria:** Children less than 1 ½ years and those above 14 years and already on ART.

### Methodology

Written and informed consent of all parents / caretakers was taken before performing the tests and examination. All children were confirmed HIV seropositive using Three Rapid Tests (Tridot, Coombed, and Immunochromatography) were included in this study. Children enrolled in the study were subjected to detailed clinical examination and history was taken regarding family status as mentioned in proforma. A detail history, physical examination and investigations were carried out as in all cases and entered on predesigned and pretested proforma. WHO clinical staging criterion[4] was used to classify the children in the study. Each subject was followed for one year every 6 monthly and with clinical monitoring and anthropometry and laboratory investigation. Full precautions were taken by using AIDS KIT containing disposable gown, face mask, cap, gloves, goggle, etc.

## RESULTS

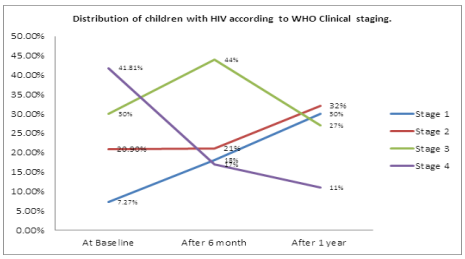
**Table1:** Distribution of children according age, sex and signs and symptoms

| | Variable | Total | Percentage |
|---|---|---|---|
| Age | 1 ½ – 3 year | 05 | 4.55 |
| | >3 – 5 year | 07 | 6.36 |
| | > 5year | 98 | 89.09 |
| Sex | Male | 70 | 63.63 |
| | Female | 40 | 36.37 |
| Presenting symptoms | Weight loss | 62 | 56.36% |
| | Fever | 40 | 36.36% |
| | Cough | 35 | 31.81% |
| | Diarrhea | 25 | 22.72% |
| | Skin lesions | 30 | 27.27% |
| | Swelling | 7 | 6.36% |
| | Ear discharge | 23 | 20.9% |
| | Oral thrush | 6 | 5.45% |
| Presenting signs | Lymphadenopathy | 58 | 52.72% |
| | Hepatomegaly | 54 | 49.09% |
| | Fever | 34 | 30.9% |
| | Pallor | 29 | 26.36% |
| | Skin rash | 24 | 21.81% |
| | Hair changes | 10 | 9.09% |
| | Edema | 9 | 8.18% |
| | Oral thrush | 8 | 7.27% |
| | Splenomegaly | 12 | 10.90% |
| | Hepatosplenomegaly | 15 | 13.63% |
| | Clubbing | 2 | 1.81% |
| | Icterus | 4 | 3.63% |
| | Parotitis | 2 | 1.81% |

Table1.Showed that age and sex wise distribution for diagnosis of HIV. Maximum number of patients i.e. 89.09% diagnosed of HIV were >5 years of age. 63.63% children were male. It was observed that weight loss (56.36%) was the most common presenting symptoms in HIV patients in the study followed by fever (36.36%), cough (31.81%).Whereas oral thrush was the least common complaint (5.45%).On clinical examination it was observed that lymphadenopathy (52.72%) was the most common sign observed followed by hepatomegaly 49.09%.

**Table 2:** Distribution of children with HIV according to WHO Clinical staging

| Time duration After ART therapy | WHO CLINICAL STAGING | | | |
|---|---|---|---|---|
| | Stage 1 | Stage 2 | Stage 3 | Stage 4 |
| At Baseline (n=110) | 08 (7.27%) | 23 (20.90%) | 33 (30%) | *46 (41.81%)* |
| After 6 month (n=100) | 18 (18%) | 21 (21%) | 44 (44%) | 17 (17%) |
| After 1 year (n=100) | 30 (30%) | 32 (32%) | 27 (27%) | 11 (11%) |




All the children in the study were classified according WHO clinical staging. It was observed that 41.81% children were in stage 4 i.e. in clinically poor condition and only 7.27% children were in stage 1. After 6 months of HAART clinical staging was done in all the study population. But out of 110 children, 10 children were not traceable so they were excluded from study. The staging of the remaining children was observed to be increasing. It was observed that children in stage 1 have increased from 7.27% to 18% after 6 months of HAART. Whereas after one year of HAART it was observed that children in stage 1 were increased to 30%. And children in stage 4 were decreased to 11%. 12 shows WHO clinical staging of children with HIV with 41.81% children were in stage 4 and 7.27% were normal at the start of therapy

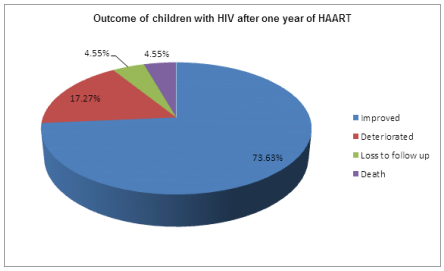
**Table 3:** Distribution of children with HIV according to adverse drug reactions after HAART

| Adverse drug reaction | Number | Percentage |
|---|---|---|
| Nausea, Gastritis | 11 | 10% |
| Nevirapine rash | | 6.36% |
| Jaundice | 1 | 0.9% |
| Anemia | 1 | 0.9% |

It was observed that adverse reactions reported in the study were very less. Most commonly reported adverse reaction was nausea/ gastritis (10%). Nevirapine rash was observed in 6.36% cases. Jaundice and anemia was observed in one case each

**Table 4: Outcome of children with HIV after one year of HAART**

| Outcome | Number of patients | Percentage |
|---|---|---|
| Improved | 81 | 73.63% |
| Deteriorated | 19 | 17.27% |
| Loss to follow up | 5 | 4.55% |
| Death | 5 | 4.55% |




When the outcome of institution of HAART after one year was calculated it was observed that decoration in health was observed in 17.27% cases. 4.55% children were loss to follow up and 4.55% children died in the course of treatment. While majority (73.63%) of the children showed improvement in health

## DISCUSSION

The present prospective study was carried out at Government Medical College, Latur in ART Centre and pediatric ward with the objective to study effect of HAART on WHO clinical staging. Out of 110 patients 70(63.63%) were males and 40(36.37%) females depicting male predominance. Male predominance was seen in most of the studies as in Lodha *et al*[6] (2006) with 89.3%, Bachou *et al*[7] (2006) with 62% and Agrawal *et al*[2] (2009) with 74.5% males. Causes of male predominance can be because females are less cared for and looked after in our society as compared to male leading to more number of male candidates brought for routine check up and follow up. It was observed that majority of the children were more than 5 year old at the time of diagnosis of HIV. The mean age of diagnosis was 6.9 years that was similar to Bolton Moore (2007)[8] and Priyadarshini *et al* (2009)[3] studies having age of diagnosis of 7 years and 6 years respectively. Variation was observed in the presenting symptoms in the present study. Weight loss was observed in 62(56.36%) cases whereas fever in 40(36.36%), cough in 35(31.81%), diarrhea in 25(22.72%), skin lesions in 30(27.27%), swelling in 7(6.36%), ear discharge in 23(20.9%) and oral thrush in 6(5.45%) patients. Weight loss was most common seen in 56.36%. Similar observations seen in Lodha *et al*[6] (2006) and Sharma *et al*[9] (2009) studies where weight loss was most common symptom seen 81.3% and 26% of patients respectively. However in studies done by Swaminathan *et al*[10] (2002), Shah *et al*[11] (2004), M bewe *et al*[12] (2009) and Agrawal *et al* (2009)[2] most common presenting complaints were cough (97%),skin rash (79%), URTI (58%)and fever (53%) respectively. Clinical course and symptomatic presentation varies from patient to patient and from country to country, the progression and outcome of HIV/AIDS is influenced by factors such as baseline health and nutritional status, environment, endemic diseases and access to therapy. It is important to understand the presentation of HIV disease in the local context.[13] On complete clinical examination of children fever was observed in 30.9% children, lymphadenopathy in 52.72%, pallor in 26.36%, skin rash in 21.81%, hair changes in 9.09%, edema in 8.18%, hepatomegaly in 49.09%, oral thrush in 7.27%, splenomegaly in 10.90%, hepatosplenomegaly in 13.63%, clubbing in 1.81%, icterus in 3.63% and parotitis in

1.81%.Lymphadenopathy was the most commonly observed physical finding seen in 52.72% patients. Similar observations were seen in studies as Hamid *et al* (2008) and Agrawal *et al* (2008).[2, 14] Generalized lymphadenopathy and Hepatosplenomegaly are common clinical presentations. These features are a part of diffuse infiltrative lymphocytosis syndrome (DILS) associated with a milder form of disease and possibly associated with a good prognosis in children[42].Table no. 2 showed changes in clinical staging of the children with HIV on HAART. It was observed that there was significant improvement in the clinical staging. At the baseline Majority of children i.e. 71.81% were in WHO clinical Stage 3 and 4 at start of study, while 27.19% were in stage 1 and 2. Similar observations were found in Agrawal *et al* (2008), M wangelwamubiana (2009) and Bolton Moore (2010).[2, 8, 15] However, In Shailanaykwazi (2009) study, 58% of children's on ART were in Stage 2.This may be due to majority of children's were initiated onto ART when they are symptomatic (WHO Stage 2 and 3).[16] After 6 months of HAART clinical staging was done in all the study population. It was observed that children in stage 1 have increased from 7.27% to 18% after 6 months of HAART. Whereas after one year of HAART it was observed that children in stage 1 were increased to 30%. And children in stage 4 were decreased to 11%. Thus it can be observed that there was improvement in healthy status in children after one year of HAART. In present study after HAART 10% children experienced nausea, 6.36% had rash due to nevirapine, 0.9% complained jaundice and 0.9% suffered severe anemia. Gastritis was most common adverse reaction with 10 % of patients; Gastritis was severe in single patient who needed to switch over to alternative regimen. 1 patient had severe anaemia secondary to Zidovudine for which he was shifted to alternate Stavudine based regimen. Observations seen in studies conducted by Kumar swami *et al* (2008) and Parakh *et al* (2009) reported rash as most common adverse reaction with 25.4% and 10% respectively, followed by Nausea and gastritis seen in 20.9% and 6.6% of patients.[17,18] In this study out of 110 patients 81 (73.63%) improved, 19 (17.27%) deteriorated, 5 (4.54%) were lost to follow up and 5 (4.54%) died during study period. HAART lead to very good improvement in patient's clinical, nutritional as well as immunological parameters. Similar improvement in these parameters was seen in studies an agrawal *et al*, Moore *et al* and Lodha *et al*.[2, 6, 8] Those who deteriorated even on ART were mostly orphans and were looked after by caretakers. Also there compliance to ART was poor with poor nutritional supplements provided with caloric and protein deficient diet to most of them. Longer travelling distances made access to care more difficult to the point that children stopped coming back for consultation.[19]The time intervals between CD4 measurements were long and there was no systematic recall of children with low CD4 counts as children only came on their scheduled appointment. Finally, delays in the identification and training of a caregiver, especially if child was orphan, were observed.[19] Mortality was observed mainly within 2 – 3 months after starting of drug therapy in 4 out of 5 patients. This could be due to late diagnosis of patients HIV status typically observed in present. All 4 patients who died were recently started on ART and were already in stage 4 of disease both clinically and immunologically. Causes of mortality documented for 5 patients in our study were bronchopneumonia in 2children, generalized sepsis in 1 child, HIV encephalopathy in 1 child and burns in 1child. Mortality due to burns in female patient with whole family in current study also emphasizes on social stigma related to HIV infection in our society. Causes of death reported by shibi *et al* (2009) and brady *et al* (2010) [57, 63] were HIV encephalopathy, pyogenic meningitis, End-stage AIDS, pneumonia, pyrexia, diarrhea and wasting syndrome and tuberculosis. The differences in various studies in relation to mortality rate and causes could be due to the differences in clinical manifestations, early versus late presentations, duration of follow-up, presence of opportunistic infections, availability of ancillary and supportive care, etc. at various centers.[11] The very low dropout rate among children on HAART suggested they were better followed-up than those not on ART.

## CONCLUSION

Thus in the end we can conclude that there was improvement in the clinical profile of children with HIV after one year of HAART

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