

Clinical spectrum of Pediatric HIV across A.R.T. centers in Chhattisgarh

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Abstract

Introduction: Pediatric HIV is a major world health problem, which is progressing at an alarming rate. Few studies have been done about variable clinical manifestation of pediatric HIV infection in children. This study intends to know the clinical profile of HIV infection in children of Chhattisgarh, evaluate the seroconversion rates of babies born to HIV seropositive women, possible maternal, obstetrical, and feeding factors influencing them, patient's adherence to ART and opportunistic infections in affected children. **Methods:** All pediatric HIV cases from 1½ year to 14 year registered in A.R.T. centres of Chhattisgarh. Data were analysed using SPSS system version 21. **Result:** A total of 414 children were evaluated from different A.R.T. centres in Chhattisgarh for final analysis. Male to female ratio is 1.38:1. Most common mode of transmission is from mother to child. Tuberculosis, Recurrent and Persistent Diarrhoea, Recurrent Pneumonia and Oral Candidiasis are common infection in most of the children. **Conclusion:** Average age of diagnosis of pediatric HIV is around 7.5 ± 2.1years. Majority of children are diagnosed in stage 3. Adherence therapy to A.R.T. is good. Vertical transmission is most common mode of transmission.

Key words: Adherence rate, Clinical Spectrum, HIV, Opportunistic Infection, Transmission

Introduction

Human immunodeficiency virus (HIV) is a lentivirus (a member of the retrovirus family) that causes acquired immunodeficiency syndrome (AIDS), a condition in humans in which the immune system begins to fail, leading to life-threatening opportunistic infections [1, 2]. Infection with HIV occurs by the transfer of blood, semen, vaginal fluid, pre-ejaculate or breast milk [3,4,5,6].

Pediatric HIV is becoming a major public health problem in India with rising trend of HIV infection in pregnant women [7, 8,]. Children experience more rapid disease progression than adults, with up to half of the untreated children dying within the first 2 year of life.

This rapid progression is correlated with a higher viral burden and faster depletion of infected CD4 lymphocytes in infant and children than in adult.

Accurate diagnostic test and early use of potent drugs to inhibit HIV replication have dramatically increase the ability to prevent and control of this disease [9, 10].

According to the Joint United Nations Programme on HIV and AIDS (UNAIDS) 36.7 million people and 1.8 million children under 15 years of age were living with HIV worldwide in 2015 [11]. 2.1 million people and 150,000 children under 15 years of age were newly infected with HIV [11]. 1.1 million people and 110,000 children under 15 years of age were AIDS related deaths in 2015 worldwide [11].

The total numbers of people living with HIV in India were estimated at 21.17 lakhs (17.11 lakhs–26.49 lakhs) in 2015 compared with 22.26 lakhs (18.00 lakhs-27.85 lakhs) in 2007[12]. Children (< 15 years) account for 6.54%, while two fifth (40.5%) of total HIV infections are among female,

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Children (<15 years) accounted for 12% (10.4 thousand) of total new infections [12].

Vertical transmission (mother to child) is the main route by which childhood HIV infection is acquired [13, 14]. HIV can pass from an HIV positive mother to her child during pregnancy through placenta, during childbirth through mother's cervical secretion or blood and afterbirth through breastfeeding [3, 15].

Other modes of transmission are through infected syringes and through infected blood transfusion [16, 17, 18]. Clinical spectrum of HIV ranges from asymptomatic infection to florid AIDS [19, 20].

There is paucity of clinical data regarding Pediatric HIV in Chhattisgarh hence this study was undertaken to know the clinical profile of HIV infection in children of Chhattisgarh, evaluate the seroconversion rate of babies born to HIV seropositive women, maternal, obstetrical, feeding factors influencing them, patient's adherence to ART and opportunistic infections occurring in HIV affected children.

Result

A total of 414 children from age of 18 months to 14 years were evaluated from different ART centre in Chhattisgarh.

Table-1: Sex wise distribution of HIV positive children registered at ART centres

Sex	HIV positive children	Percentage
Male	240	58
Female	174	42
Total	414	100

There is higher prevalence of HIV in boys (58%) as compared to girls (42%)

Table-2: Different mode of HIV transmission among children registered at ART centres

Risk factor	Frequency	Percent
Mother To Child	300	72.5
Blood Transfusion	61	14.7
Unknown	53	12.8
Total	414	100.0

In our study most common mode of Transmission is Mother to Child 72.5%, followed by Blood Transfusion 14.7%. In about 13 % cases cause could not be identified.

Material and Methods

Study design: Retrospective and prospective cross-sectional observational study

Setting: Hospital based study at ART centres of Chhattisgarh.

Inclusion criteria: 1½ year to 14 years children registered at ART centres.

Exclusion criteria: Below 1½ year and above 14 years.

Participants: HIV positive children from age 1 ½ to 14 years registered in ART centres of Chhattisgarh

Variables: Age, Sex, Mode of transmission, Compliance to ART, Opportunistic infection

Data Source: Record review of data registered at ART centres.

Bias: Reporting bias, observation bias

Study size: 414 children registered at ART centres

Statistical methods: Measurement of central tendency and dispersion

Table-3: Mother's HIV status of children enrolled in study.

HIV Status Mother	Frequency	Percent
Positive	296	71.5
Negative	87	21
Unknown	31	7.5
Total	414	100

In our study 71.5% Mothers were HIV positive, 21% Mothers were HIV Negative and in 7.5% HIV status were Unknown.

Table- 4: Adherence to ART of HIV positive children registered at ART centres

Adherence	Frequency	Percent
96% to 100%	280	67.6
91% to 95%	52	12.6
Less than 90%	9	2.2
Total	414	100.0

In our study 67.6% patient had 96-100% adherence to therapy followed by 12.6% children had 91-95% adherence to therapy.

Table- 5: CD4 count at different time interval during the course of ART

CD4 count (per mm ³ of blood)	At 1 st visit	At ART Medical Eligibility	At 1 month after start of ART	At 6 month after start of ART	At 12 month after start of ART
More than 500	55.8%	33.4%	37%	46%	47.8%
200-500	31.4%	37.7%	33.5%	22%	18.6%
100-200	8.9%	9.9%	12%	3.9%	1.9%
Less than 100	3.8%	4.3%	2.9%	0.96%	0.48%

In our study there is gradual improvement in CD4 count with start of ART. In 14.4% cases CD4 count is increased to a level of more than 500/mm³.

Table- 6: Opportunistic Infection among HIV positive childrens

Opportunistic infection	Frequency	Percentage
Recurrent & Persistent Diarrhea	174	42.1%
TB (Pulmonary & Extra Pulmonary)	120	29%
Recurrent Pneumonia	70	16.8%
Oral Candidacies	63	15.2%
Sepsis	36	8.6%
Recurrent or Chronic Ear Infection	18	4.3%
Herpes Infection	18	4.3%
Meningitis	15	3.62%
Scabies	14	3.4%
Pneumocystis Pneumonia	7	1.6%
Recurrent Pyoderma	4	0.9%

This table give us a view of all major opportunistic infection recorded in our study. Diarrhoea and Tuberculosis were two most common infections observed.

Discussion

In our study, male to female ratio came out to be 1.38:1. 43% cases were between age group 18 months to 5 years, 34.3% cases between 6-10 years, and 22.7% cases between 10-14 years were observed. Similar findings were observed in a study conducted by Ramesh R. Pol in April 2004 to June 2005 at Karnataka, 49.3% children were between 1.5 to 5 years and in Merchant RH, 74.73% patients were below the age of five years [21, 22]. In other Indian studies males slightly outnumbered females [15, 23, 24]. In other studies across the globe male were more than females [25, 26] but in one study from Nigeria male to female ratio was 1:1.14 [27]. In this study average age of diagnosis was around 7.5 year (90 months). In other Indian studies mean age of diagnosis were 50, 54 and 75 months [28, 29, 30].

The most common mode of HIV transmission was from mother to child in 72.5% cases, followed by blood transfusion in 14.7%, and in 12.8% cases transmission is unknown. Similar findings were observed in other studies [22,29,30].

In our study 71.5% mothers were found to be HIV Positive, 21% were HIV Negative, status of 7.5% mother was unknown. In a study conducted from 2000 to 2001 at Mumbai, 78% mothers were found to be HIV Positive [19]. In another study from Cameroon in 2011, the HIV status of more than half of the mothers was known and all of them were positive, whereas the HIV status of most of the fathers was not known [25].

In the present study 75.1% mothers were alive. In a study from South Africa on pediatric antiretroviral programme found that 61.8% mothers and 56.37% fathers were alive at the time of enrolment of children between age group of 4-17 years [31], while in an Indian study 94% mother and 90% fathers were alive during study [19].

Most of the patients (67.6%) shows 96-100% adherence to ART, followed by 12.6% which show 91-95% adherence, less than 90% adherence is 2.2%. In a study done in South India at Bengaluru, Karnataka, 90.9 % of the children were optimally adherent [32]. Most studies from low- and middle-income countries reported more than 75% adherence, whereas most studies from high-income

countries report < 75% adherence [33]. In the present study 80.9% were on ART and 19.1% were on pre ART. In the study conducted by Rakesh Lodha et al in 2006 at Delhi, 57.73% children were receiving antiretroviral drugs, 46.27% children did not opt for antiretroviral therapy [20]. Children receiving antiretroviral therapy showed improvement in nutritional parameters [20].

There is significant improvement in CD4 count following ART therapy. Before the start of ART 33.4% children had CD 4 count more than 500. At the end of 12 month of ART 47.8% children had CD4 count more than 500. In the study conducted by Sunil Gomber in December 2008 to June 2009 at ART centers of Delhi, there was significant improvement in both clinical and immunological (CD4 count) staging at the 6 month after initiation on ART [34]. Baseline CD4 counts rather than clinical staging can be a primary determinant for initiation of antiretroviral treatment in HIV infected children (35). In other studies across the globe CD4 count increases following ART [35, 36, 37, 38].

In our study prevalence of opportunistic infection was 46.5%. Tuberculosis was the most common opportunistic infection seen in 29% of children. The most common clinical manifestations in our study were Anemia 47.3%, Recurrent and persist Diarrhea 42.1%, Recurrent Respiratory tract Infection 36.4% (Recurrent URTI 19.6% and Recurrent LRTI 16.8%), Malnutrition 37.1%, Recurrent oral lesions 34.6% (Recurrent Oral ulcer 19.4%, Recurrent Oral Candidiasis 15.2%), Tuberculosis 29%, Lymphadenopathy 26.5%, Dermatitis 21% and Hepato-splenomegaly 13.4%.

The common clinical findings in a study carried out at Cameroon were prolonged fever 44.6%, malnutrition 37.6%, lymphadenopathy 34.4%, respiratory tract infections 34.4% and diarrhea 24.5% [31]. In India, the main clinical manifestations were oral candidiasis 43%, pulmonary tuberculosis 35%, recurrent respiratory infections 26%, bacterial skin infection 21%, papulo-pruritic dermatitis 19%, hepato-splenomegaly and lymphadenopathy 14% each and chronic diarrhea 7% [24]. Similar findings observed in others Indian studies [19, 20, 21, 22, 23].

Conclusion

In this study Vertical transmission is most common mode of transmission of perinatal HIV. Average age of diagnosis is around 7.5 years. This delayed diagnosis could be due to unawareness and lack of diagnostic facilities. In this study majority of children are diagnosed in stage 3 means they are having clinical signs and symptoms of AIDS. Tuberculosis is the most common infection with majority of children are presenting with pulmonary tuberculosis. Adherence therapy to ART is good. There is need of proper antenatal care and early identification and treatment of HIV positive mothers so vertical transmission can be reduced. There is also need of early diagnosis of HIV positive children so that they can be picked up in stage 1 or 2 and there proper treatment can be started.

What is already known- No information is available for clinical spectrum of Pediatric HIV in Chhattisgarh state.

What this study adds- There is late diagnosis of Pediatric HIV in Chhattisgarh though adherence to ART is good.

Contributors

- Shrikant Sanadhaya: Visited ART centres and collected DATA.
- Shashikant Dewangan: Analyzed data, Prepared manuscript and submitted article.
- Sharja Phuljhele: Supervised the research work.

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