

Assessing the Clinical and Anthropological Profile of HIV Positive Adolescents in Surat, Gujarat: A Cross-Sectional Study

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Abstract:

Introduction: Adolescents (10–19 years) and young people (20–24 years) continue to be vulnerable to Human Immunodeficiency Virus (HIV) infection despite efforts to date. HIV-infected adolescents with long standing HIV infection often face considerable physical challenges - delayed growth and development, stunting/wasting and malnutrition. **Objectives:** (a) To study the clinical profile of HIV infected adolescents (b) To assess the anthropometric profile using age-standardized scores. **Method:** The cross-sectional study was conducted at HIV clinic, at Anti-retroviral Treatment (ART) Centre, Surat (Tertiary Care Level Institute) among adolescents between age-group 13-19 years during December-2015 to February-2016. Based on the desk review, total 134 adolescents were identified, out of which 105, could be contacted during study period and fit in the inclusion criteria. Participants who were alive, on Pre-ART/ART and their status had been disclosed and gave consent for the interview were included in the study. **Results:** Majority of the participants were on ART (95.3%). About half (55.6%) of the participants had suffered from opportunistic infection. Majority of the patients were at WHO stage I (93.75). Mean CD4 count during study was 640 cells/cubic mm (SD±401.42). Out of 105 participants, 14.5% were suffering from severe thinness and 14.5% were suffering from thinness & 36.2% participants were suffering from severe stunting and 16.4% were suffering from stunting. Mean age of participants was 15.64 years (SD ±2.02). Majority of the participants belonged to Socio-economic class IV (36.8%) and class III (31.1%) followed by Class V (17%), class II (13.2%) and Class I (1.9%). **Conclusion:** The anthropometric measurements suggest that nutrition aspect is not fully recovered, as majority of the participants suffer from stunting and wasting; stunting more than wasting indicating chronic malnutrition.

Key words: Adolescent, Anthropometry, CD4 count, HIV-AIDS, Malnutrition

Introduction:

Adolescents (10–19 years) and young people (20–24 years) continue to be vulnerable, both socially and economically, to Human Immuno deficiency Virus (HIV) infection despite efforts to date. Adolescents and young people represent a growing share of people living with HIV worldwide.

According UNAIDS estimates in 2019, number of adolescents living with HIV would be 1.6 million.^[1] In 2018 alone, 190,000 [59,000-380,000] adolescents between the ages of 10 and 19 were living with HIV.^[2]

In India in 2017, 21,00,000 people were living with HIV.^[3]

HIV-infected adolescents with long standing HIV infection often face considerable physical challenges - delayed growth and development, late puberty, stunting/wasting, malnutrition, etc.^[4] The perinatally infected children, as the immune system weakens, grow slowly and become vulnerable to recurrent infections and illnesses. Hence, as they become adolescents, they are already physically stunted and vulnerable to innumerable infections.^[5]

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Beginning at birth, HIV-infected infants often have smaller size and lower birth weight than non-infected children born to HIV-infected women. The causes of growth dysregulation are varied, and can be due to alterations in gastrointestinal function, chronic or repetitive infections, and alterations in metabolic and endocrine function. The metabolic and endocrine effects may be the consequence of the primary infection or secondary to the use of any of the medications required to treat HIV infection and its complications.^[6]

In HIV-infected individuals, poor nutritional status is a strong predictor of survival, even after controlling for CD4+ cell counts: A weight loss of >66% of ideal body weight was linked to the timing of death in Acquired Immunodeficiency Syndrome (AIDS) patients.^[7, 8] Padmapriyadarsini and Swaminathan reported that a nutritional assessment should be conducted for all patients irrespective of the stage of HIV disease in order to assess status and identify potential problems promptly.^[9]

Hence, the current study was undertaken to understand the clinical profile and anthropometry specifically among adolescents as they are often neglected in research compared to young adults or children.

Objectives:

- (a) To study the clinical profile of HIV infected adolescents
- (b) To assess the anthropometric profile using age-standardized scores

Method:

This is a cross-sectional study among adolescents living with HIV and attending Anti Retroviral Treatment (ART) Centre. The study was conducted at ART Centre, Surat (Tertiary Care Level Institute) among adolescents between age-group 13-19 years during December-2015 to February-2016.

Desk-review of ART Centre data, Surat of those registered at ART centre in age-group between 13-19 years was conducted. ART Centre was established in 2006, all the patients registered since 2006, who were in adolescent age-group during study period were selected for the study. Total 134 adolescents were identified, out of which 105, could be contacted during study period and fit in the inclusion criteria. Participants who were alive, on Pre-ART/ART and their

status had been disclosed and gave consent for the interview were included in the study.

Data collection tools included Pre-designed form, ART cards, Weighing scale and Stadiometer. Height for the age (for stunting) and Body Mass Index (BMI) for the age (for wasting) were calculated using Standardized Age-specific Z-scores prepared by World Health Organization (WHO) for adolescents. Thinness, severe thinness, stunting and severe stunting were labelled based on these scores. If the value was less than 2 Standard deviations (2SD) than the score for that age, it was labelled as thinness or stunted and less than 3 Standard deviations (3SD) was labelled as severe thinness and severe stunting. Modified Prasad classification was used to classify participants on the basis of socio-economic classification. All India Consumer Price Index of November 2015 was referred for the same.

Study was approved by Human Research Ethics Committee (Institutional Ethical Committee), Government Medical College, Surat and NACO (National AIDS Control Organisation). Identities of the participants were protected at all times and participation was voluntary.

Results:

Socio-demographic Profile:

The study participants included were from varied socio-economic and demographic backgrounds as depicted in Table 1. Mean age of participants was 15.64 years (SD \pm 2.02). Majority of the participants were boys (67.9%) followed by girls (32.1%). The religion respected by majority of the participants was Hindu (90.6%) followed by Muslim (9.4%). Nearly half of the participants belonged to Gujarat (53.8%) and the other are migrants from other states (46.2%). The study reported that 24% of the participants have dropped school while 76.4% have continued their education. Majority of the participants belonged to Socio-economic class IV (36.8%) and class III (31.1%) followed by Class V (17%), class II (13.2%) and Class I (1.9%).

Clinical History

As depicted in Table 2, Out of total 105 participants, majority of the participants were on ART (95.3%) followed by Pre-ART (4.7%). Out of total 105 participants, 91 (85.8%) had acquired HIV by vertical transmission followed by unknown (5.6%), blood

transfusion 4 (3.8%), and others (4.8). About half (55.6%) of the participants had suffered from opportunistic infection. Out of these 61 participants, almost half (31) had suffered from tuberculosis.

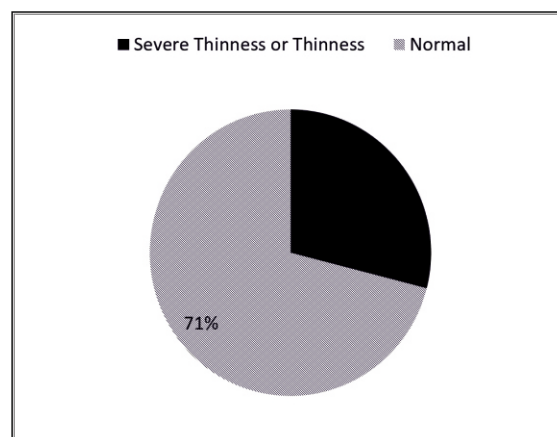
At registration, about one-third of the participants (32.15) were at WHO stage II followed by WHO stage III (25.5%) as shown in Table 3. Currently, majority of the patients were at WHO stage I (93.75). Median CD4 count at registration was 280 cells/cubic mm (Inter Quartile Range: 169-527). Median CD4 count during study period was 545 cells/cubic mm (Inter Quartile Range: 309-910).

Anthropometric Measurements:

Mean weight of the participants was 34.57 kilograms (SD±8.03). Mean height of the participants was 142.77 centimeters (SD±11.46). BMI for the age was calculated using Z-scores prepared by WHO for adolescents (10-19yrs). According to these scores, 14.5% participants were suffering from severe thinness and 14.5% were suffering from thinness as demonstrated in Figure 1. Height for the age was calculated using Z-scores prepared by WHO for adolescent. According to these scores, 36.2% participants were suffering from severe stunting and 16.4% were suffering from stunting which is shown in

Figure 2.

Figure 1: Pie-chart depicting distribution of participants according to Body Mass Index for age (indicator for thinness or wasting)



Discussion:

Out of total 105 participants, 91 (85.8%) had acquired HIV by vertical transmission followed by blood transfusion 4 (3.8%), 2 (1.9%) by intravenous route, 1 (0.9%) by homosexual route, 1 (0.9%) by heterosexual route and 6 (5.6%) route of transmission were unknown. Study conducted by Marfatia Y S et.al in 2008 at Vadodara, India reported that 64% of HIV-Positive adolescents were infected by vertical

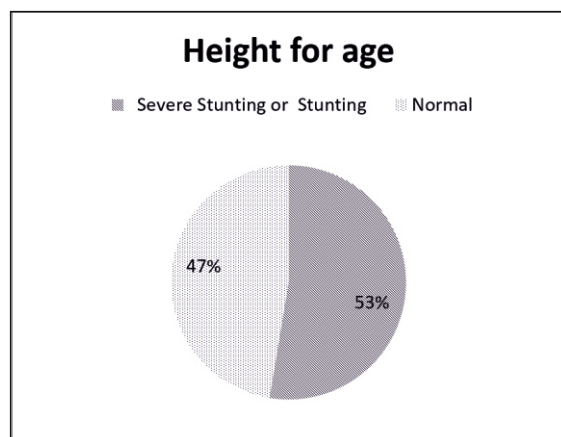
Table 1: Socio-demographic profile among participants

Variable	Categories	Frequency (%) n=105
1.Age	Mean age	15.64±2.022
2.Sex	Boy Girl	72(67.9) 33(32.1)
3.Religion	Hindu Muslim	95(90.6) 10(9.4)
4.Native State	Gujarat Other	56(53.8) 49(46.2)
5.Education	Continue Dropped	81(76.4) 24(23.6)
6.Socio-Economic Class (Modified Prasad Classification)	I II III IV V2	2(1.9) 14(13.2) 33(31.1) 38(36.8) 18(17.0)

Table 2: Distribution of participants according to Clinical History

Variable	Categories	Frequency (%) =105
1.ART Status	Pre-ART On ART	5(4.7) 100(95.3)
2.Route of transmission	Vertical Homosexual Heterosexual intercourse Injectable Drug use Blood transfusion Unknown	91(85.8) 1(0.9) 1(0.9) 2(1.9) 4(3.8) 6(5.6)
3.Oppurtunistic Infections H/o	Yes TB Other No	61(55.6) 31 30 44(44.4)

transmission, followed by 12% by blood transfusion, **Figure 2: Pie-chart depicting distribution of participants according to Height for age (indicator for stunting)**



12% by sexual transmission and 12% unknown.^[10]

In the present study, at registration, about one-third of the participants (32.15) were at WHO stage II followed by WHO stage III (25.5%). Currently, majority of the patients were at stage I (93.75). The findings indicate improvement in clinical WHO staging after ART initiation among the study participants. Prakash P. et al reported that 41.0% HIV-Infected children were in WHO clinical stage 1 and 17.9% were in stage 4 at registration.^[11]

Mean CD4 count at registration was 373 cells/cubic mm (SD±316.27) and current mean CD4 count was

Table 3: Distribution of participants according to CD4 count and WHO staging

Variable	Categories	Frequency (%) n=105
1.WHO stage (at registration)	I	32(30.2)
	II	34(32.1)
	III	27(25.5)
	IV	12(11.3)
2.WHO stage (study period)	I	99(93.4)
	II	3(2.8)
	III	2(1.9)
	IV	1(0.9)
3.CD4 Count (at registration)	Median number	280 cells/cumm (IQR: 169-527)
4.Cd4 Count (study period)	Median number	545 cells/cumm (IQR: 309-910)

640 cells/cubic mm (SD±401.42) in the present study. This indicated the significant clinical improvement after ART Initiation. Out of 105 participants, 61 (55.6%) had suffered from any form of opportunistic infection. Out of these 61 participants, almost half (31) suffered from tuberculosis. Study conducted by Ferrand et al in 2010 reported 44% of the HIV Positive adolescents had suffered from tuberculosis.^[12] Salhanda D. et al in a study conducted at Mangalore reported that Tuberculosis was the most common opportunistic infection^[13]. BMI was calculated using Z-scores prepared by WHO for adolescents (10-19yrs). According to these scores, 14.5% participants were suffering from severe thinness and 14.5% were suffering from thinness & 36.2% participants were suffering from severe stunting and 16.4% were suffering from stunting. Swetha G et al. reported 46 (59.7%) HIV infected children were stunted, 36 (46.8%) were underweight and 15 (19.5%) had low BMI for age.^[14] Ferrand et al. reported 73% HIV-infected adolescents suffering from thinness and 52% suffering from stunting.^[12]

The limitation of the study was the lack of baseline anthropometric measurements of the participants on registration; which was overcome by using Standardised age-specific scores for adolescents prepared by WHO for wasting and stunting.

Conclusion:

The anthropometric measurements suggest that nutrition aspect is not fully recovered after treatment, as majority of the participants suffer from stunting and wasting; stunting more than wasting indicating chronic malnutrition. Malnutrition and infections form a vicious cycle. It was observed in the study as almost half of participants had suffered from opportunistic infections even if on ART. This instigates the need for further research and interventions in the nutrition domain for the adolescents living with HIV so that they may live healthy and well-nourished lives.

Declaration:

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Conflict of Interest: Nil

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