Original Research Paper

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A Study of Anti Retro Viral Therapy for Hiv Infection in Pediatric Age Group in Rajasthan

Medical Science

KEYWORDS : HIV, AIDS, ART, CD4+count

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ABSTRACT

Introduction: *More than 1,000 children are newly infected with HIV every day, and of these more than half will die as a result of AIDS because of a lack of access to HIV treatment.*

Material & Methods*: In this study (Dr. S.N. medical college, jodhpur) 280 HIV positive children (1-15 year age) were enrolled. 5 Ml venous blood was drawn by patients, then serum was separated for CD4 count and HIV by ELISA.*

Result*: After anti retroviral therapy there was significant decrease in number of cases with immunosuppression.*

Conclusion*: Transmission of HIV reduced by antiretroviral therapy during antenatal period.*

Introduction: Most HIV-infected children are born in developing countries. It is estimated that in 2004, 640,000 children <15 yr of age were newly infected with HIV. In addition, because HIV-infected mothers are likely to die of AIDS, 13 million children have been orphaned thus far and an estimated 19 million will be orphaned by 2010. [1]

HIV infection in children progresses more rapidly than in adults, and some untreated children die within the 1st 2 yr of life. This rapid progression is correlated with higher viral burden and faster depletion of infected CD4 lymphocytes in infants and children than in adults. Accurate diagnostic tests and the availability of potent drugs to inhibit HIV replication have dramatically increased the ability to prevent and control this devastating disease.[1]

HIV infection in humans is considered pandemic by the World Health Organization (WHO). Nevertheless, complacency about HIV may play a key role in HIV risk.[2][3] Antiretroviral treatment reduces both the mortality and the morbidity of HIV infection, but routine access to antiretroviral medication is not available in all countries. [4] .[5]

HIV infection leads to low levels of $CD4^+$T cells through three main mechanisms: First, direct viral killing of infected cells; second, increased rates of apoptosis in infected cells; and third, killing of infected $CD4^+$ T cells by CD8 cytotoxic lymphocytes that recognize infected cells. When $CD4^+$ T cell numbers decline below a critical level, cell-mediated immunity is lost, and the body becomes progressively more susceptible to opportunistic infections. HIV progresses to AIDS at a variable rate affected by viral, host, and environmental factors; most will progress to AIDS within 10 years of HIV infection: some will have progressed much sooner, and some will take much longer[6][7] Treatment with antiretrovirals increases the life expectancy of people infected with HIV. Even after HIV has progressed to diagnosable AIDS, the average survival time with antiretroviral therapy was estimated to be more than 5 years as of 2005.[8]

Without antiretroviral therapy, someone who has AIDS typically dies within a year. [9] In the context of HIV in India, Rajasthan with an official sero prevalence of 0.5 percent can be described as a highly vulnerable, high-priority state. There are strongindications that Rajasthan is indeed a highly vulnerable state because Rajasthan is the site for many religious fairs and festivals, and attracts 25 percent of all Indian tourism (both domestic and foreign). More than 1,000 children are newly infected with HIV every day, and of these more than half will die as a result of AIDS because of a lack of access to HIV treatment.[10]

Nine out of ten children infected with HIV were infected through their mother either during pregnancy, labour and delivery or breastfeeding. [11]Without treatment, around 15-30 percent of babies born to HIV positive women will become infected with HIV during pregnancy and delivery and a further 5-20 percent will become infected through breastfeeding. HIV infection can occur in medical settings; for instance, through needles that have not been sterilized or through blood transfusions where infected blood is used. Sexual transmission does not account for a high proportion of child infections.

However, a lack of necessary investment and resources for adequate testing, antiretroviral drugs, and prevention programmes, as well as stigma and discrimination, mean children continue to suffer the consequences of the epidemic. Due to lack of aforementioned literature, we were planned this study for pediatric group in Jodhpur, Rajasthan.

Material and Methods: The present study was conducted at the Department of ART centre MDM Hospital, in collaboration of Umaid Hospital, Dr. S.N. Medical College, Jodhpur. This is an observational study of a cohort of patients receiving HIV primary care in the Department of ART centre MDM Hospital, Dr. S. N. Medical College Jodhpur. In this study 280 HIV positive children (1-15 year age) were enrolled. 5 Ml venous blood was drawn by patients, then serum was separated for CD4 count and ELISA for HIV .

Elisa; Enzyme linked immunosorbent assay
It is a highly sensitive and specific test and a standard procedure for diagnosing HIV infection. The recommended first line test by NACO is Elisa. The sensitivity and specificity of Elisa is 99.7% and 95% or more respectively.

II. Rapid test:
These tests have total reaction time less than 30 minutes. Rapid tests are

- Dot blot assays
- HIV spot and comb tests

III. Simple tests:
These tests are not as fast as rapid tests. They take 1-2 hours.

Results: In present study there Male children were more affected showed table no-1 . Table no-2 showed distribution of subject. Table III showed status of cases according to ART .Table IV according to WHO clin . sign. of ART. Table V, VI, VII represent mode of transmission, CD4 count in pre ART and

ART cases, respectively.

Table No. I
DISTRIBUTION OF CASES ACCORDING TO AGE & SEX

AGE GROUP (YEAR)	MALE (%)	FEMALE (%)	TOTAL
1-5	43 (23.24)	28 (29.47)	71
5-15	142 (76.76)	67 (70.53)	209
TOTAL	185 (100)	95 (100)	280

$X^2 = 1.287$, DF= 1; p> 0.3

In present study there was male predominance in all age groups as compared to female.

Table No. II
DISTRIBUTION OF CASES ACCORDING TO AGE & SEX AT TIME OF DIAGNOSIS (YEAR)

AT TIME OF DIAGNOSIS AGE GROUP (YEAR)	MALE (%)	FEMALE (%)	TOTAL
1-5	77 (41.62)	43 (45.27)	120
5-15	108 (58.38)	52 (54.73)	160
TOTAL	185 (100)	95 (100)	280

$X^2 = 0.34$, DF= 1; p> 0.7

Age of diagnosis has wide variability ranging in 5-15 year of age group.

Table No. III
DISTRIBUTION OF CASES ACCORDING TO STATUS (ON ART/ NOT ON ART)

STATUS (ON ART/ NOT ON ART)	No. of case (n=280)	%
NOT ON ART (PRE ART)	192	68.57
ON ART	88	31.43
TOTAL	280	100

In present study, 192 (68.57%) cases were not on ART (Anti retro viral therapy) and 88 (31.43%) cases were on ART treatment.

Table No. IV
DISTRIBUTION OF CASES (PRE ART & ART) ACCORDING TO WHO CLIN. STAGE

WHO CLIN. STAGE	PRE ART CASE (n=192)	%	ART CASE (n=88)	%
I	101	52.60	13	14.77
II	78	40.62	41	46.60
III	12	6.25	31	35.23
IV	1	0.53	03	3.40
TOTAL	192	100	88	100

$X^2 = 58.23$, DF= 3; p< 0.001

In present study, most of pre ART cases were in WHO clinical stage I (52.6%) and ART cases were in WHO clinical stage II (46.62%).

Table No. V
DISTRIBUTION OF CASES (PRE ART & ART) ACCORDING TO MODE OF TRANSMISSION

MODE OF TRANSMISSION	NO. OF CASES (n=280)	%
MOTHER to CHILD	269	96.07
BLOOD TRANSFUSION	06	2.15
UNKNOWN	05	1.78
TOTAL	280	100

In present study, most common mode of transmission was mother to child in 96.07% cases. Transmission by blood transfusion was seen in 2.15% cases.

Table No. VI
DISTRIBUTION OF CASES (PRE ART) ACCORDING TO CD_4 COUNT (IMMUNOLOGICAL CATEGORY)

	CD_4 COUNT	1-5 year No. of Cases 65	%	CD_4 COUNT	5-15 year No. of Cases 127	%
No evidence of suppression	≥ 1000	21	32.30	≥ 500	81	63.78
Evidence of moderate suppression	500-999	35	53.85	200-499	40	31.49
Severe suppression	≤ 500	09	13.85	≤ 200	06	4.73
	TOTAL	65	100	TOTAL	127	100

In present study it was found that immunosuppression was most commonly occurs in early age group (1-5 year). In present study, in pre ART cases 47% of cases presented with immunosuppression.

Table No. VII
DISTRIBUTION OF ART CASES ACCORDING TO CD_4 COUNT (IMMUNOLOGICAL CATEGORY)

	Before Start ART (n-88)	%	After ART (n-62)	%
No evidence of suppression	04	4.54	43	69.35
Evidence of moderate suppression	41	46.59	13	20.95
Severe suppression	43	48.87	06	9.70
	88	100	62	100

$X^2 = 72.49$, DF= 2; p< 0.001

In present study, in ART cases before ART treatment immunosuppression was found in 95.46% cases and after ART treatment immunosuppression was seen only in 30.65% cases. After anti retroviral therapy there was significance decrease in number of cases with immunosuppression.

Discussion: In present study there was male predominance in all age groups as compared to female (M: F = 1.94:1). This study was correlated with the study of Garcia JV, Miller AD [12] . In present study 192 cases (68.57%) were

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not on ART (pre ART cases) and 88 cases (31.43%) were on ART (ART cases). In present study, most of pre ART cases were in WHO clinical stage I (52.6%) and ART cases were in WHO clinical stage II (46.62%). In present study, in ART cases before ART treatment immunosuppression was found in 95.46% cases and after ART treatment immunosuppression was seen only in 30.65% cases. After anti retroviral therapy there was significant decrease in number of cases with immunosuppression. This shows that ART treatment improves the immunity in AIDS patients. These finding were correlated with the study of C Pryce.[13] They were found similar result in their study. This study was also correlated with the study of human rights watch 2006.[14]

Conclusion: In children most common mode of transmission was mother to child transmission and this can be reduced by antiretroviral therapy during antenatal period.

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