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Research Article

HIV Mother to Child Transmission-An Empirical and Cross Sectional Study

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Abstract

Mother-to-child-transmission of HIV (HIV MTCT) is a major route of HIV infection in children. The literature cited that, the mother to Child transmission of HIV spread from a women living with HIV to her child during pregnancy, childbirth (also called labor and delivery) or of breast feeding (through breast milk). However, more number of study would be necessary for the implement the policy at worldwide. In this paradigm the present study to estimate the HIV transmission rate (HIV mother to child) in association with PMTCT and WHO guidelines on prospective and retrospective basis. A prospective and cross sectional study was conducted in the Department of Paediatrics, Bangalore Medical College and Research Institute during the period of (2013-14). A total 147 ANC's were recruited with written consent and Institutional ethical clearance was obtained in accordance with stipulated WHO and NACO guidelines. The correlation between the HIV MTCT with or without ARV drug before and after delivery was analysed unpaired t-test, the research was prospectively studied with mean duration 2.5 - 3.0 years. The intervention of MTCT rate was recorded at regular follow up HAART therapy. As per the findings, the MTCT rate was found to be fewer percentage expression who received ARV drug before after pregnancy and results was found to be statistically significant differ ($p < 0.01$, chi-square 13.52; odd ratio 1.5 - 2.21) when compare to without ARV drugs. The mean CD4 count with ARV drug was 308 micro/dl and in case of without ARV mean CD4 count was 385.52 micro/dl. The infection rate was estimated with and without ARV it was found to be (5.74%) and (23.33%) respectively besides with WHO clinical stage III and IVth respectively. The present study concludes that, the strengthen the PMTCT guidlines to reduce the transmission risk of HIV MTCT. Abensece of ARV drug increase the transmssion rate at five fold more likely to transmit the disease.

Keywords: MTCT; PMTCT; HIV; AIDS; ARV

Introduction

Mother-to-child-transmission of HIV (HIV MTCT) is a major route of HIV infection in children [1,2]. However, it is an estimated 27 million pregnancies in a year, only about 52.71% attend health services in child bearing stage. Of those who availed health services, approximately 8.83 million antenatal care women's (ANCs) were received HIV counselling and testing out of which 12,551 pregnant women were detected to be HIV positive. To enhance this coverage, a joint directive principles driven from the National AIDS Control Programme (NACP) and the National Rural Health Mission (NRHM) regarding convergence of the two programme components was issued in July 2010, explicitly intervention stated that, the universal HIV screening should be included integral component of routine ANC follow up. The objective of interest ensures that pregnant women who are diagnosed with HIV would be linked to HIV services for their own health as well as to prevent of HIV transmission to her new born babies under the PMTCT programme. In the absence of any inter vention, substantial proportion of children born to women liv-

ing with HIV acquire HIV infection from their mothers either during pregnancy, labour, deliver y or during the time of breast feeding (BF). Without any intervention of risk, the chance of transmission o f HIV from infected pregnant women to her children is estimated to be 2 - 5% [1,2]. Use of highly active antiretroviral therapy (HAART) (NVP/Sy NVP) to mother-baby pairs has shown to be quite effective in reducing this transmission as low as 10%. Although, use of single dose Navirapine (sd-NVP) at the onset of labour significantly reduce pre-partum HIV transmission at an early stage. Since, it is less effective rather than other available antiretroviral ARV prophylaxis and it does not cover the risk of HIV transmission during the antenatal (ANC's) or breast-feeding periods (BF). Further, it also adds to the risk of acquiring drug resistance to nevirapine (NVP) as well as cross resistance to Efavirenz (NNRTIs). WHO in 2010 had recommended two more efficacious regimen, option A and option B, to further reduce the chances of HIV transmission from mother-to-child. Further in 2013, consolidated ART guideline. WHO new guidelines (June 2013) recommend two options viz. (i) Providing lifelong ART to all the pregnant and breastfeeding women living with HIV regardless of CD4 count or clinical stage (ii) Providing ART (ARV drugs) for pregnant and breastfeeding women with HIV during the mother- to-child transmission risk period and then continuing life-long ART for those women eligible for treatment. In this paradigm the present study to estimate the HIV transmission rate (HIV mother to child) in association with PMTCT and WHO guidelines on prospective and retrospective basis.

Material and Methods

A prospective and cross-sectional study was conducted in the Department of Paediatrics, Bangalore Medical College and Research Institute during the period of 2013-14. A total 147 ANC's were recruited with written consent and Institutional ethical clearance was obtained in accordance with stipulated WHO and NACO guidelines. The qualitative and quantitative data was collected from the pretested and tested questionnaires with highest accuracy. Inclusion and exclusion criteria was adopted for recruitment of ANC's cases inclusion; the ANC's should be on HAART therapy at least 6 months from the date of treatment inception, all cases were fulfil the eligibility criteria of HAART treatment (WHO and NACO PMTCT guidelines). Exclusion criteria; terminal illness, lost to follow up of treatment, missed treatment any co morbid cases not inclusion for the study. The demographic, biological, clinical and Biochemical parameters like CD4 count, RNA plasma viral load, clinical history, type of ARV drug, duration of therapy, WHO clinical stage and associated parameters were extracted from the patient ART and Pre ART card. Collected data was analysed by Minitab -9.60 version. Univariate and logistic regression statistical method was employed to test the hypothetical statement at 1% level of significance.

Results

A Total 147 ANC's were selected for the study; the mean age of the patient was 28.15 years with SD 2.12 years (IQR 21 - 32 years). The age group was categorized based on the mean and SD, the age between 18 - 23 years comprises (31.0%), 24 - 29 (65.0%) and > 29 years (4%). Majority of the cases settled in urban setup (86.0%), Literate (45.0%) and (22%) in case of Urban and rural, 90% cases belongs to below poverty line (< 2500 kilo calories food intake) and 10% was found to be above poverty line (APL). The occupation structure is depends on the individual case, the majority of the patients working as house wife (54.0), Private firms (42%) and business (2%) and Agriculture (2%) respectively. HIV status of spouse was extracted from the data source (64%) cases were found HIV positive with HIV testing retention rate of (69%), the infected spouses were belongs to truck driver and business (bridge population) who are taking HAART treatment outside the provenance and adjacent ART centre. Past ART history was extracted from the NACO open source software, an approximately (19%) ANC's were received the treatment before on set of pregnancies with treatment duration was 2.31 years with SD 0.58 years respectively. WHO clinical stage has been correlated with HAART therapy, Stage I (20%), Stage II (32%), Stage III (30%) and stage IV was (18%). The serial CD4 count was recorded during the study period on cohort basis, the mean CD4 count at base line was 215 ± 30.63 micro/Dl; 6 months mean CD4 count was (289 ± 22.11 micro/Dl); 12 months (356 ± 17.45 micro/Dl) and 24 months mean CD4 count was (485 ± 12.55 micro per Dl), the serial CD4 count was significantly associated with HAART and HIV MTCT as per the PMTCT guidelines. Low CD4 count (< 250 micro /Dl) at the inception of therapy is significantly increase the transmission at the rate of (35%) (Figure 1).

Gravida status was attributed to estimate the HIV MTCT, primi (78%); Gravida II (12%) and Gravida III was (10%) and it was found to be statistically significant ($p < 0.01$). Post exposure prophylaxis was administered during the course of HAART, total 86% cases were received the PEP at onset of pregnancy and before pregnancy period with mean duration of HAART was 2.12 years with SD 0.11 years.

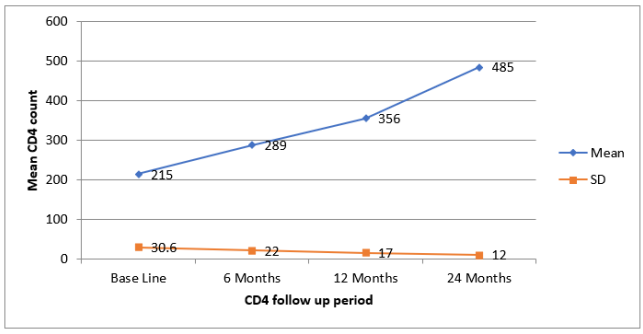

Figure 1: CD4 count follow up status and mean values.

From the table 1 depicted that, the correlation between the HIV MTCT with or without ARV drug before and after delivery was analysed unpaired t test, the research was prospectively studied with mean duration 2.5 - 3.0 years. The intervention of MTCT rate was recorded at regular follow up HAART therapy. As per the findings from the table matrix 1, the MTCT rate is found to be fewer percentage expression who received ARV drug before after pregnancy and results was found to statistically significant differ ($p < 0.01$, chi-square 13.52; odd ratio 1.5 - 2.21) when compare to without ARV drugs. The mean CD4 count with ARV drug was 308 micro/dl and in case of without ARV mean CD4 count was 385.52 micro/dl. The infection rate was estimated with and without ARV it was found to be (5.74%) and (23.33%) respectively besides with WHO clinical stage III and IVth respectively

Discussion

The literature cited that, the mother to Child transmission of HIV spread from a women living with HIV to her child during pregnancy, childbirth (also called labor and delivery) or of breast feeding (through breast milk). Mother to child transmission of HIV is also called the Perinatal transmission [1,2] in the absence of any intervention of ARV drug (snNVP before and after therapy), the transmission rate drew up to 15 - 35% in developing countries. This rate can be reduced below 5% with effective intervention during the periods of pregnancy and breast feeding. These practical interventions involve ARV treatment for mother and a short course of NVP dosage for the baby. They also include measures to prevent HIV acquisition in the pregnant woman and appropriate BF. In our study the ARV augmented intervention will be transmit the infection to her child is just (5.74%), study comparable to Misrahi., *et al.* [3] and Basavarajaiah DM., *et al.* [1,2]. Tresoldi., *et al.* [4] studied the HIV MTCT in infants, the study describes skilled delivery attendance at birth can reduce the risk of morbidity and mortality for both the mother and the child and also infection rate reduced up to < 5%. The current review also found that HIV positive mothers who deliver at Home were five times more likely to have HIV positive child than HIV positive women who attended skilled birth attendant at health care facilities. This could be lack of PMTCT interventions during and immediate after labor and delivery for mothers who gave birth at home. Moreover, intervention available at health facilities include the use of standard infection prevention

Attributes	With ARV				Without ARV			
	Mean CD4 (micro/dl)	ARV (No)	MTCT (No)	Duration (Years)	Mean CD4(micro/dl)	ARV (No)	MTCT (No)	Duration (Years)
At onset of Pregnancy	260	55	2	2.5	328	35	8	2.22
After delivery	356	32	3	2.68	455	25	6	2.48
Total			05 (5.74%)				14 (23.33%)	
P-value	≤0.0001, Chi-square 13.52 odd ratio is 1.56 to 2.21							

Table 1: HIV MTCT with or without ARV.

practices, use of partograph to follow the progress of labor, use of ARV drug before and after delivery is the safest measures to reduce the risk of HIV MTCT at an early stage. If the mother has experienced persistent prolonged labour use secondary intervention for delivery with effective management practices. A studied conducted in Western Europe also found that delivery of the babies by elective caesarean section can prevent MTCT. A similar study intervention conducted by Basavarajaiah DM., *et al.* [1,2]. Another important aspects of study highlights that, the presence of PMTCT during pregnancy, labor and delivery and breast feeding period is essential in the reduction of HIV positive child. The findings of the results

showed that HIV positive women with no PMTCT intervention were more than seven times more likely to have HIV positive child, like wise without any maternal and or child PMTCT, approximately 5 - 25% infants will be HIV infected. This could be due to the benefits of ARV drugs in reducing maternal viral load and CD4 count (> 550 micro/dl at inception of HAART) and thereby reducing the risk of HIV transmission from MTCT. WHO report also showed that ARV drug and prophylaxis to a women and her infant could reduce the risk of MTCT to < 2%. Many study reported at global level HIV Positive mother who did not follow ANC care, late enrolment to HIV exposed infant follow up clinic, short duration of ART regimen, low CD4 count at inception of HAART and onset pregnancy, mothers on WHO clinical stage III and IV, and low infant birth weight (< 2.50 kgs) as an additional factors significantly associated with HIVMTCT. The outcome variable may also be affected by other confounding variable not mention this research paper. Therefore, nationwide study assess personal, health service factors and policy related reasons for a higher rate of MTCT of HIV in India is recommended [5-20].

Conclusion

The present study concludes that, strengthen the PMTCT guidlines to reduce the transmission risk of HIV MTCT. Abensece of ARV drug increase the transmssion rate at five fold more likely to transmit the disease. The short term ARV prophylaxis to prevent MTCT during pregnancy, delivery and BF for HIV infected women not in need of treatment.Without ARV drug during the pregnancy, the risk of transmission from mother to child 1 in 4. The risk of HIV transmssion reduced elective Cesearain section, HAART and formula feeding significalty reduces the HIV MTCT.

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