



Mortality in HIV Exposed Infants and It's Determinants

Dr Dipti Agarwal

MD, LECTURER, DEPARTMENT OF PEDIATRICS, S N MEDICAL COLLEGE, AGRA, UP, INDIA

Dr Abnish Kumar

JUNIOR RESIDENT, DEPARTMENT OF PEDIATRICS, S N MEDICAL COLLEGE, AGRA, UP, INDIA

Dr Nirmal Chandra Prajapati

MD,FIAP, PROFESSOR OF PEDIATRICS, PRINCIPAL, JALAUNMEDICAL COLLEGE, ORAI, UP

Dr.saroj Singh

MS, MAMS, FICOG, FICMCH, FIJAGO, PROFESSOR & HEAD, DEPARTMENT OF OBSTETRICS & GYNECOLOGY, S.N. MEDICAL COLLEGE, AGRA, U.P, INDIA

ABSTRACT

This prospective study was conducted to study mortality in HIV exposed infants and its determinants. 30 infants born to HIV infected mothers receiving antiretroviral prophylaxis were included in the study group and 30 infants born to HIV non infected mothers (matched in gestational age) during the study period were taken as controls. 9 HIV exposed infants died in first 6 months (mean age 22 days) as compared to one in control group. Amongst maternal factors associated with high infant mortality were advanced disease stage, low CD4 counts (p value = 0.008, 0.03 respectively). Low Body mass index and anaemia (p value = 0.004, 0.06 respectively) also related significantly to high mortality. Low birth weight and prematurity (p value = 0.01, 0.001 respectively) were the infant factors associated with high mortality. This early and high infant mortality despite prophylaxis warrants additional measures to reduce negative influence of HIV infection.

KEYWORDS : HIV, MORTALITY, INFANT, CD4 COUNT, BODY MASS INDEX.

Introduction

There is little information about mortality among HIV exposed infants. Few studies have shown mortality among these infants to be higher than those born to HIV uninfected mothers [1,2]. Mothers with advanced HIV disease and immune dysfunction have reported to have higher infant mortality [3]. Low birth weight infants are also more likely to die than heavier babies [4]. There is no such literature available from India. Hence the present study was undertaken to study mortality in HIV exposed infants and its determinants.

Material and methods

This prospective study was conducted in the Department of Paediatrics, Obstetrics / Gynecology department, S.N. Medical College, Agra from March 2012 to October 2013. Ethical clearance was obtained from the institute's ethical committee prior to the study. Infants born to HIV positive mothers were included in the study and those born to HIV non infected mothers (matched in gestational age) during the study period were taken as controls. HIV testing of the mothers was done during antenatal visit and infants were tested at 6 weeks according to NACO protocol [5]. Antiretroviral prophylaxis was given according to the guidelines. Clinical details of infants were obtained at birth and follow up visits at 6, 10, 14 weeks and 6 months. Infant death (in hospital / home) and its cause were also recorded. Details of maternal examination included body mass index, haemoglobin levels (after delivery) and WHO clinical stage, CD 4 counts (at the time of delivery). HIV exposed babies were provided standard care as per guidelines. Data was analysed using SPSS software version 20.0. Infant mortality was analysed in relation to maternal and infant factors.

Results

30 HIV exposed infants (study group) and 30 controls were enrolled in the study. Majority were males in both the group (60% in study group and 53.3% in control group). 21 infants in study group completed follow up at 6 months. 9 HIV exposed infants died in first 6 months out of which 8 died in first 6 weeks (mean age 22 ± 6 days). Bronchopneumonia (5/9) and septicaemia (3/9) were major cause of mortality. Out of 30 controls, only one died at age of 24 days, rest completed the follow up. Out of 22 infants tested for HIV in study group at 6 weeks, 2 were positive.

Mean birth weight of HIV exposed infants was 2.40 kg ± 0.49 compared to 2.70 kg ± 0.47 in controls (p value = 0.03). Frequency of morbid conditions in HIV exposed infants were more compared to controls (16/21 vs 12/28). Diarrhea was the major morbid condition observed in study group.

Table-1 Maternal and infant factors affecting mortality in HIV exposed infants:

Variables	Infant died till 6 months	Infant Alive till 6 months	P value	Odds/hazard ratio
Maternal factors				
BMI ≤ 18.5	7	4	0.004	14.8
> 18.5	2	17		
Maternal Hb ≤ 10	8	11	0.06	7.2
Hb > 10	1	10		
Maternal CD4 ≤ 350	5	3	0.032	7.5
CD-4 > 350	4	18		
WHO clinical stage			0.008	12.0
Stage I&II	3	18		
Stage III&IV	6	3		
Infant factors				
Birth weight			0.01	16
≤ 2.5 kg	8	7		
> 2.5 kg	1	14		
Sex			0.418	2.5
Female	5	7		
Male	4	14		
Gestation			0.001	40.0
Pre-term	6	1		
Term	3	20		

The high mortality in HIV exposed infants was associated with various maternal and infant factors as shown in Table -1. Low maternal BMI ≤ 18.5 kg/m² and low maternal haemoglobin levels ≤ 10 gm/dl (moderate to severe anemia) were associated with high mortality (p value = 0.004, 0.06 respectively). Low CD-4 count ≤ 350 and advanced HIV disease was associated with high mortality (p value = 0.03, 0.008 respectively). Table 1 also depicts low birth weight, prematurity to be associated with high mortality (p value = 0.01, 0.001 respectively).

Discussion

We identify an overlooked population of infants at high risk for mortality. Early infant mortality among HIV exposed infants was strikingly high in our study reaching about five times more than the infants of non infected mothers. Study from Zambia has quoted the number of deaths as 4.6% by 4 months in HIV exposed infants[4].

Most of the mortalities occurred prior to HIV testing (mean age 22 ± 6 days) . If HIV infection caused mortality during the short interval between birth and test (0 to 6 weeks), it would have to result in extremely rapid disease progression which seems an unlikely explanation.

Morbidities in HIV exposed infants reported in our study were nearly 1.5 times more than infants born to non-infected mothers . Similar morbidity pattern has been reported in another study[6].The prevalence of low birth weight was found to be 21.4% in study group , similar to other studies [7,8] .

We expanded on the observations of high infant mortality in HIV exposed infants to demonstrate association with various maternal factors . Our results showed advanced maternal disease and low maternal CD4 cell counts to have detrimental effect on infant mortality which are consistent with observations of Newell et al[9].

Poor nutritional status of HIV infected mothers using parameters as low BMI and low hemoglobin levels have been shown to be associated with high infant mortality in our study ,as also reported elsewhere [4,10]

Apart from maternal factors,infant factors such as low birth weight and prematurity were also associated with infant mortality, as shown in other studies [1-2].

There is wide coverage of national programs to prevent mother-to-child HIV transmission in India. However, our data of early and high infant mortality suggests that they are not able to counteract the full negative impact of HIV infection . Early HIV testing and understanding of the factors causing high mortality may help develop interventions that could complement programs to reduce mortality in HIV exposed infants.

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