Infant Outcomes among a cohort of HIV-Infected Pregnant Women with and without TB in South Africa: The Tshepiso study

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Background

Perinatal morbidity is higher in infants born to mothers infected with HIV and TB, than in infants born to mothers with HIV only. Infants of mothers with TB are more likely to suffer from perinatal death, prematurity, intrauterine growth retardation, and low birth weight. Higher rates of HIV MTCT have been reported among neonates born to mothers with HIV/TB co-infection.

In South Africa, nearly **30%** of pregnant women presenting for prenatal care are HIV-infected. Through an integrated PMTCT program, infants receive nevirapine (NVP) prophylaxis from birth through either six weeks of life or post cessation of breast feeding dependent on maternal ART treatment.

In Soweto, up to **3%** of pregnant women with HIV also have active TB.[1] Per South African TB guidelines, infants born to mothers who have been on TB treatment for less than 2 months receive 6 months of isoniazid preventive therapy and defer BCG vaccination until completion of IPT.

Methods

Tshepiso is a prospective cohort study of HIV-infected pregnant women with active TB (TB/HIV cases) matched 1:2 with HIV-infected pregnant women without diagnosed active TB (HIV controls) in Soweto, South Africa. Women are followed through pregnancy, the peri- and postpartum periods to record maternal and infant HIV, TB and overall clinical outcomes.

All infants receive HIV prophylaxis with weight-based NVP and underwent HIV DNA testing at 7 days, 6 weeks, 6 and 12 months.

Infants born to TB/HIV cases were referred for evaluation of congenital TB and initiation of TB prophylaxis with either isoniazid or isoniazid with rifampin for six months.

Results

From January 2011 through January 2014, we enrolled 209 (median age 29 years) HIV-infected pregnant-women, 73 TB/HIV cases and 136 HIV controls.

Two mothers withdrew consent, 1 was LTFU, 3 relocated and could not be followed and 1 had a spontaneous abortion. 203 infants were born, with 199 live births (68 TB/HIV cases, 131 HIV controls). 1 mother died,1 withdrew consent for her infant, and 2 mother-infant pairs were LTFU. 195 infants were followed including 127 HIV controls and 68 TB/HIV cases.

Table 1: Birth Outcomes

	TB/HIV Cases N=70	HIV Controls N=133	p value
Stillborn			
N(%)	2(2.9%)	2(1.5%)	p >0.10
Gestational Age at birth			
Med[IQR]	38[37,40]	39[38,40]	p =0.10
Min-max	30-42	28-42	
Preterm (<37wks gestation)			
N(%)	13(21%)	19(16%)	p >0.10
Birth Weight			
Med[IQR]	2995[2540,3350]	3060[2750,3345]	p =0.08
Min-max	980-3800	920-4425	
Low Birth Weight (<2500 g)			
N (%)	14 (21%)	14 (11%)	p =0.05
5 minute Apgar Score <7			
N(%)	3(4.8%)	2(1.6%)	p >0.10

Table 2: Infant Morbidity & Mortality

	TB/HIV Cases N=68	HIV Controls N=127	Rate Ratio	p value
Infant mortality	4	1		
Rate per 100 live births	5.88	0.79	7.47	p=0.03
(95% CI)	(1.63,14.38)	(0.02,4.31)	(0.85,65.52)	
Neonatal mortality	1	1		
Rate per 100 live births	1.47	0.79	1.87	p>0.10
(95% CI)	(0.04, 7.9)	(0.02,4.31)	(0.12,29.39)	
Perinatal HIV transmission	2	2		
Rate per 100 live births	2.94	1.57	1.87	p>0.10
(95% CI)	(0.36,10.22)	(0.19,5.57)	(0.27,12.97)	
Infant TB	5	0		
Rate per 100 live births	7.35	0	Not Defined	p=0.005
(95% CI)	(2.43-16.33)			

Results

Combined fetal/infant mortality was 8.6 and 2.3 per 100 births among infants of TB/HIV cases and HIV controls respectively (p=0.04).

Among infants born to cases, 47 (76%) initiated TB prophylaxis within the first month of life. 100% of infants born to TB/HIV cases and HIV controls received NVP prophylaxis.

5 infants (7.4%) born to TB/HIV cases were diagnosed and treated for TB, none of which were congenital TB. 1 had confirmed tuberculosis, 3 had probable tuberculosis; 1 had possible TB meningitis.[2]

No congenital anomalies were noted in infants born to TB/HIV cases or HIV controls, except for one infant (TB/HIV case) born with trisomy 18.

Conclusions

- Our cohort revealed significantly higher fetal/infant mortality among infants born to TB/HIV co-infected mothers (TB/HIV cases) with 8.6 deaths /100 births as compared to infants exposed to HIV only (HIV controls) with 2.3 deaths/100 births.
- There is a higher rate of HIV MTCT among TB/HIV cases (2.9%) vs. HIV controls (1.6%), not statistically significant, but overall a low rate of transmission in the cohort.
- There is no difference in infants born to TB/HIV cases and HIV controls at birth in terms of prematurity or median birth weight, but there was a higher rate of LBW in infants born to TB/HIV cases.
- Infant NVP prophylaxis uptake was 100%.
- IPT uptake was 76% among TB exposed infants.

References

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