

Raltegravir as Prophylaxis for a Newborn of a Mother with Multidrug-Resistant HIV: A Case Report

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Abstract: Perinatal transmission of HIV has been markedly reduced in the era of antiretroviral prophylaxis, yet challenges remain when maternal infection is complicated by multidrug resistance (MDR) and poor adherence to therapy. Zidovudine (AZT) has been the cornerstone of neonatal prophylaxis, but resistance and maternal treatment failure necessitate alternative strategies. We describe a neonate born to a mother with multidrug-resistant (MDR) HIV and poor adherence to antiretroviral therapy (ART), in whom prophylaxis with zidovudine (AZT) and raltegravir was initiated at birth. The infant remained HIV polymerase chain reaction (PCR) negative at 1 and 6 weeks of life without adverse effects. This case highlights the potential role of raltegravir in neonatal prophylaxis, especially when maternal resistance compromises standard regimens. To our knowledge, this report is among the few published cases to illustrate a resistance-guided neonatal prophylaxis strategy using raltegravir in the setting of maternal multidrug-resistant HIV, offering a practical message for clinicians managing similarly high-risk deliveries. The literature review suggests that raltegravir is safe and effective in neonates, supported by pharmacokinetic studies and guideline recommendations. Individualized prophylaxis in high-risk infants may be critical to preventing perinatal transmission in the era of antiretroviral therapy (ART) resistance.

Keywords: Raltegravir, HIV, multidrug-resistant HIV, neonatal prophylaxis, perinatal transmission.

INTRODUCTION

Mother-to-child transmission (MTCT) of HIV has historically been a major driver of pediatric HIV infection worldwide. Without intervention, the risk of vertical transmission ranges from 15–45% depending on breastfeeding practices, maternal viral load, and access to healthcare [1]. With the introduction of routine maternal antiretroviral therapy (ART), elective cesarean delivery, formula feeding, and neonatal zidovudine prophylaxis, transmission rates have dropped to below 2% in many high-income settings [2].

Zidovudine (AZT) remains the backbone of neonatal prophylaxis. However, the increasing prevalence of AZT resistance in both pregnant women and perinatally infected infants has been documented. In US cohorts, zidovudine resistance mutations were identified in up to 17% of infants [3, 4]. Such resistance is concerning, as it may increase the risk of transmission despite prophylaxis [5].

Another challenge in preventing mother-to-child transmission (MTCT) is maternal adherence to antiretroviral therapy (ART). Women with poor adherence and multidrug-resistant (MDR) HIV represent a particularly high-risk group, where standard prophylactic regimens may be inadequate. In these cases, individualized prophylaxis informed by maternal resistance profiles is critical.

Integrase strand transfer inhibitors (INSTIs), such as raltegravir, have emerged as potential agents in both maternal therapy and neonatal prophylaxis. Raltegravir is potent, generally well tolerated, has a favorable resistance profile, and achieves adequate transplacental passage [6]. Importantly, neonatal pharmacokinetic data and case reports support its safe use in early infancy [7, 8].

Here, we describe a neonate born to a mother with poorly controlled, multidrug-resistant HIV. The infant received prophylaxis with zidovudine and raltegravir and remained HIV-negative. This report is clinically relevant because published neonatal experience with raltegravir prophylaxis in the setting of maternal multidrug resistance remains limited, and it provides readers with a concrete example of individualized, resistance-informed prophylaxis in a high-risk newborn. We also review the literature on raltegravir use in neonatal prophylaxis.

CASE PRESENTATION

Maternal History

The mother, a 33-year-old gravida 3 para 2, had been diagnosed with HIV-1 infection 12 years prior to pregnancy. Over the years, she had received multiple antiretroviral therapy (ART) regimens in a tertiary care hospital in Saudi Arabia. Prior to conception and during pregnancy, her regimen included darunavir 600 mg twice daily, ritonavir 100 mg once daily, and raltegravir 400 mg twice daily.

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Adherence assessment through clinic attendance, patient self-report, and pharmacy refill records revealed poor adherence before and during pregnancy. Resistance testing demonstrated mutations conferring resistance to all nucleoside reverse transcriptase inhibitors (NRTIs) and non-nucleoside reverse transcriptase inhibitors (NNRTIs), except etravirine and rilpivirine. Despite inconsistent adherence, maternal viral load remained undetectable throughout pregnancy, although her CD4 count was 212 cells/ μ L at 32 weeks of gestation.

The patient declined an elective cesarean section. At 38 weeks' gestation, she presented in spontaneous labor and delivered vaginally without complications. She received standard intrapartum zidovudine prophylaxis.

Neonatal Management

The neonate was delivered with a birth weight of 3.2 kg and Apgar scores of 8 and 9 at 1 and 5 minutes, respectively. Formula feeding was initiated.

Given maternal multidrug-resistant (MDR) HIV and poor adherence, the infant was started on a combination prophylaxis regimen at birth consisting of:

- Zidovudine 4 mg/kg/dose orally twice daily
- Raltegravir 1.5 mg/kg/dose orally once daily

Both drugs were continued for 6 weeks. The infant remained clinically stable throughout. Laboratory monitoring showed no evidence of hepatotoxicity or hematologic toxicity.

HIV polymerase chain reaction (PCR) testing at 1 week and 6 weeks was negative.

DISCUSSION

This case illustrates the potential utility of raltegravir as part of neonatal prophylaxis in infants at high risk of HIV transmission due to maternal multidrug-resistant (MDR) infection and poor antiretroviral therapy (ART) adherence. For readers, the key novelty of this case lies in the successful use of raltegravir as a tailored neonatal prophylactic agent, despite maternal resistance and adherence concerns complicating conventional decision-making. Vertical transmission persists primarily in contexts of maternal antiretroviral therapy (ART) failure or late diagnosis [9]. Multidrug-resistant (MDR) HIV complicates management, as maternal regimens may not achieve virologic

suppression, and standard infant prophylaxis may be inadequate. Case reports have documented transmission of MDR HIV despite prophylaxis [4].

Raltegravir is an integrase strand transfer inhibitor (INSTI) with a distinct mechanism of action and potent antiviral effect. Its addition to neonatal prophylaxis regimens is rational in cases where nucleoside reverse transcriptase inhibitor (NRTI)- or non-nucleoside reverse transcriptase inhibitor (NNRTI)-based prophylaxis is compromised by maternal resistance.

Several reports describe the successful use of raltegravir in neonates. In one case, raltegravir was initiated at day 6 of life due to maternal NNRTI resistance, and prophylaxis was continued for 6 weeks with favorable outcomes [6]. The International Maternal Pediatric Adolescent AIDS Clinical Trials (IMPAACT) P1110 trial provided pharmacokinetic data supporting neonatal raltegravir dosing; adequate drug exposure was achieved with no major safety concerns [7]. Raltegravir is metabolized by uridine diphosphate glucuronosyltransferase 1A1 (UGT1A1), raising theoretical concerns for hyperbilirubinemia. However, clinical studies did not demonstrate significant adverse events [7, 8].

Historically, zidovudine monotherapy was sufficient to reduce transmission rates significantly [2]. For infants at higher risk-such as those with maternal viremia near delivery-combination prophylaxis (zidovudine + lamivudine + nevirapine or raltegravir) is now recommended in US Department of Health and Human Services (DHHS) guidelines [10]. The World Health Organization (WHO) similarly endorses risk-based prophylaxis strategies, though implementation varies globally [11].

In our case, nevirapine was avoided due to maternal NNRTI resistance, making raltegravir a logical substitute. This provides a practical example of how maternal resistance data can directly inform neonatal prophylaxis selection when standard options may be suboptimal. Evidence from clinical trials further supports this approach. IMPAACT P1026S evaluated raltegravir pharmacokinetics in pregnant women and found adequate maternal and placental transfer [12]. IMPAACT P1110 demonstrated raltegravir's safety and tolerability in neonates [7]. Shapiro *et al.* (2010) showed improved outcomes with maternal ART plus enhanced infant prophylaxis [13], while Nielsen-Saines *et al.* (2012) demonstrated reduced transmission with combination prophylaxis compared to zidovudine alone [14].

Raltegravir's metabolism overlaps with bilirubin, but no significant increase in hyperbilirubinemia was observed in clinical trials [7, 8]. Our patient similarly did not develop complications.

Preventing mother-to-child transmission (MTCT) remains a global priority. Although rates are low in high-income countries, resource-limited regions still struggle with high perinatal transmission due to late diagnosis and poor antiretroviral therapy (ART) access [15]. Expanding prophylaxis options with agents like raltegravir may benefit these populations.

CONCLUSION

Raltegravir appears to be a safe and effective prophylactic option for neonates born to mothers with multidrug-resistant HIV or poor antiretroviral therapy (ART) adherence. This case adds to the limited but growing evidence supporting its use in neonatal prophylaxis. For the medical community, the present report contributes a clinically actionable example of resistance-guided neonatal prophylaxis in a setting where published evidence remains sparse. Clinicians should consider maternal resistance profiles when designing infant prophylaxis regimens. Larger studies are warranted to establish standardized dosing, assess long-term safety, and integrate raltegravir into global guidelines.

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