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Abstract Title:

Perinatal Syphilis Infection alters Newborn Antibiotic Exposure and Utilization Rate

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Abstract Description:

Background: Optimal antibiotic stewardship has led to reduced unnecessary exposure in newborns. Increase in perinatal infections such as syphilis and listeriosis may increase antibiotic exposure in newborns without culture proven sepsis.

Objective: To evaluate the temporal trend in culture proven sepsis, antibiotic exposure rate, antibiotic utilization rate (AUR) in newborns, and newborns treated for perinatal infection in the last 11 years. Methods: We included newborns born and admitted to a public safety net hospital in California from 2008-2018. We reviewed the data of NICU admissions, early onset sepsis (positive culture <72h) and late onset sepsis (positive culture >72h), maternal syphilis infection and Listeria chorioamnionitis requiring treatment in newborn, infant antibiotic exposure and antibiotic days. We examined the frequency of blood or CSF culture positive newborn infections, serological evidence of perinatal syphilis infection and Listeria chorioamnionitis requiring treatment in newborns, and antibiotic exposure per 1000 live births of all inborn infants. We summarized AUR (antibiotic days / 100 NICU patient days) and the AUR excluding perinatal infections necessitating antibiotic use. Results: We had 42,809 live births included and 3125 NICU admits included. Neonatal antibiotic exposure during birth hospitalization decreased from 37/1000 in 2008 to 10/1000 live births in 2018 while culture positive infection has remained stable at about 2/1000 live births (Figure 1, Table 1). The AUR for NICU admissions has decreased from 12% in 2008 to 6% by 2014 and has remained stable since (Figure 2). In the 11 years, 29 mothers of infants admitted to NICU were positive for syphilis and 2 were positive for Listeria. Of those, 14 infants required treatment for syphilis and 3 (including one set of twins) for Listeria. Perinatal syphilis and Listeria chorioamnionitis in 2017 contributed to 53% of the AUR (Figure 2).

Conclusion: There is a steady decrease in antibiotic exposure and AUR in newborns during the birth hospitalization over the last 11 years while newborn infection has remained low.

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Prolonged duration of antibiotic treatment for perinatal infections such as syphilis and listeriosis has contributed to >50% of AUR in a single year, magnified by the lower AUR. It is important to consider episodic perinatal infections necessitating antibiotic use in the absence of a positive newborn culture when benchmarking appropriate use of antibiotics.