Hepatitis B birth dose vaccination patterns in the Military Health System, 2014-2017

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\textbf{Background}

Since 2005, the universal hepatitis B (HepB) birth dose has been recommended for all medically stable infants weighing >2,000 g at birth. The timing of the birth dose provides a critical safeguard and prevents infection among infants born to HBsAg-positive mothers not identified prenatally. We assess infant HepB vaccination in the U.S. Department of Defense’s Military Health System (MHS) to identify trends in vaccination coverage and sociodemographic factors associated with non-receipt of the birth dose, receiving the first HepB vaccine >3 days of life, and not receiving any HepB vaccine in the first 18 months of life utilizing parental refusal codes. To our knowledge, this is one of the first studies assessing trends in parental refusal of the HepB birth dose utilizing administrative claims parental refusal codes.

\textbf{Methods}

We conducted a retrospective cohort analysis of MHS live births from January 1, 2014 through June 30, 2017 utilizing administrative claims data. Data were included from 44 hospitals in 24 unique states, territories, or countries. We analyzed infant delivery claims data and post-discharge vaccination data through 18 months of age, which provided detail on timing of administration of first HepB vaccine and reflected vaccine hesitancy categories. We analyzed diagnosis codes for vaccine refusal and vaccination and current procedural terminology (CPT) codes. The outcome was categorized as receipt of HepB birth dose, HepB vaccine received at >3 days of life, no HepB vaccine received in first 18 months of life, and missing. Generalized linear mixed effects models with a logit link were used to assess factors associated with vaccination patterns.

\textbf{Results}

HepB birth dose vaccination coverage increased from 80.2% in 2014 to 89.4% in 2017. The percentage of children who did not receive any HepB vaccine in the first 18 months of life increased slightly from 1.4% in 2014 to 1.8% in 2017 and the percentage of children who received the first dose >3 days of life increased slightly from 2.2% in 2014 to 2.4% in 2017. The rate of missing diagnosis codes for vaccine refusal or vaccination decreased over time from 16.2% in 2014 to 6.5% in 2017. Among the 4,533 infants with a diagnosis code for refusal of the HepB birth dose prior to hospital discharge, 2,645 (58%) received the first dose >3 days of life. The majority (88%) of infants receiving the first vaccine >3 days of life received the first dose at greater than 42 days of life. Factors associated with delay of HepB birth dose include white maternal age and older maternal age. Factors associated with refusal or not vaccine in the first 18 months of life include white maternal age and older maternal age. Factors associated with refusal or not vaccine in the first 18 months of life include white maternal age and older maternal age. Factors associated with refusal or not vaccine in the first 18 months of life include white maternal age and older maternal age.

\textbf{Conclusion}

HepB birth dose coverage in the MHS is higher than the national estimate and has increased over time from 2014 to 2017. Concurrently, parental referral of the birth dose has also increased. However, missing diagnosis codes for vaccine refusal or vaccination have decreased over time, implying improvements in hospital implementation of universal HepB birth dose policies or improvements in coding. The MHS provides a comprehensive longitudinal dataset to link mothers and their infants from infant claims data to outpatient claims data. In this population, when immunization information systems are not available for analysis, claims data provide an acceptable, if not better, alternative to understand the HepB birth dose vaccination trends over time and risk factors associated with different vaccination patterns. Utilizing administrative claims data has the benefit of differentiating reasons for non-receipt of the birth dose over time.

\textbf{Figure 3. Flow diagram of generation of inpatient dataset}

\textbf{Figure 4. Hepatitis B birth dose vaccination patterns, 2014-2017}

\textbf{Table 1. Hepatitis B vaccination patterns by individual characteristic and adjusted odds ratios for receiving first hepatitis B vaccine >3 days of life and not receiving any hepatitis B vaccines in first 18 months of life among MHS beneficiaries in cohort 2, 2014 - 2017}

\textbf{Table 2. Comparison of hepatitis B birth dose vaccination coverage}