286. Hepatitis B Vaccine Compliance: Comparing 2-Dose and 3-Dose Vaccines
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Background. Less than 1 in 3 US adults who initiated the 3-dose (0, 1, 6 months) hepatitis B vaccine series have completed it. HepB-CpG (Heplisav-B; Dynavax) is a new licensed adjuvanted vaccine that requires only 2 doses (0, 1 month). As part of a cluster study performed at Kaiser Permanente Southern California, we compared compliance with second dose and series completion for HepB-CpG vs. comparator vaccine (Engerix-B; GlaxoSmithKline) recipients.

Methods. The cohort included adults not on dialysis who received their first dose of hepatitis B vaccine in family or internal medicine departments from 8/1/2018 to 2/1/2019. Second dose compliance was assessed for the full cohort, but series completion was assessed for a subset vaccinated from August 7, 2018 to September 30, 2018 to allow at least 6 months’ follow-up. Completion rates were estimated using the Kaplan Meier method. Adjusted hazard ratios (aHR) were estimated using Cox proportional hazard regression with robust variance to account for within medical center clustering.

Results. There were 6500 HepB-CpG and 7733 comparator vaccine recipients (1,442 and 2,604 prior to September 30, 2018). Rates of second dose completion at 60 days were 32.9% for HepB-CpG and 29.1% for comparator vaccine, and rates of series completion at 210 days were 56.9% and 20.6%. There was no significant difference in second dose compliance (aHR 1.14, 95% CI: 0.91, 1.47), but HepB-CpG recipients were 5 times more likely to complete the series (aHR 5.17; 95% CI: 3.84, 6.89). Second dose compliance and series completion were significantly less likely among Blacks compared with Whites and significantly more likely among Asians, adults >60 years compared with <30 years, and adults living in census blocks with a median annual income of $40,000–69,000 compared with < $40,000.

Conclusion. Overall, second dose compliance was similar, but series completion was better for HepB-CpG recipients than comparator vaccine recipients, suggesting that the 2-dose vaccine could lead to improvements in coverage and protection against hepatitis B virus.

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287. Exploring the Natural History and Clinical Outcomes of Hepatitis B Core Antibody Positive Hemodialysis Patients in a Large Metropolitan Tertiary Care Hospital System with a Focus on Occult Hepatitis B
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Background. Occult Hepatitis B (OHB) is defined as hepatitis B core antibody (HBcAb) positivity in the absence of surface antibody (HBsAb) or surface antigen (HBsAg) positivity. The reported incidence ranges from 0.3% to 58% in the hemodialysis (HD) population. Our study is among the first in the United States to examine the natural history of OHB patients (patients). This work is of interest in HD patients to estimate Hepatitis B transmission risk.

Methods. We performed a retrospective analysis of 352 Hep B cAb positive HD patients between 2010 and 2017 in the Henry Ford Health System and Greenfield Dialysis Centers in SE Michigan. This system contains 5 hospitals including a 900-bed tertiary care general center in Detroit, serving a high-risk, medically complex population. Our primary outcomes were the development of HBcAb positivity, considered protective, or development of HBsAg positivity or new Hepatitis B viremia, considered adverse events. Univariate and multivariate logistic regression analysis was performed to study pertinent risk factors for the clinical outcomes comparing OHB and Non-OHB patients. Statistical analysis was performed using SAS 9.4.

Results. Of the 352 HBcAb patients studied, 98 (27%) were OHB patients. Each group shared similar baseline demographics apart from OHB patients having higher ALT and a greater proportion of drug use and Hepatitis C (Hep C) compared with non-OHB patients (Table 1). There were 15 adverse events in the non-OHB group, including 10 viremias. Only 1 adverse event was seen in the OHB group, a patient who developed viremia of 19 copies/mL (Table 2). Conversely, OHB status was a statistically significant predictor of protective HBsAb development in follow-up (P < 0.01), occurring at a 7-fold increased rate compared with non-OHB patients. Univariate analysis showed that a history of liver disease, Hep C, and drug use predicted HBsAb development (Table 3). When studying adverse outcomes, history of liver disease raises the risk of adverse events in unadjusted models (P = 0.05) (Table 4).

Conclusion. OHB patients in our center tend to develop protective HBsAb titers over time rather than develop viremia or antigenemia in contrast to non-OHB patients. Our study finds that OHB confers minimal risk of potential transmission of Hepatitis B among HD patients.

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288. Hepatitis B Virus Reactivation in Patients with Hematologic Malignancies after Anticancer Therapy Which Included Ibrutinib
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Table 1. Hepatitis B Core Antibody Positive Patients at the Henry Ford Health System and Greenfield Dialysis Centers, SE Michigan, 2010-2018.

| Hepatitis B Core Antibody Positive Patients | Henry Ford Health System | Greenfield Dialysis Centers |
|--------------------------------------------|--------------------------|-----------------------------|
| Number | 352 | 50 |
| HBsAb Positive | 254 | 40 |
| HBsAb Negative | 98 | 10 |
| HBsAg Positive | 0 | 0 |
| HBsAg Negative | 352 | 50 |

Table 2. Outcomes Expressed as a Percentage of Patients with Hepatitis B Core Antibody Positive (HBcAb +) at Henry Ford Health System and Greenfield Dialysis Centers, SE Michigan, 2010-2018.

| Outcome | Henry Ford Health System | Greenfield Dialysis Centers |
|---------|--------------------------|-----------------------------|
| Viremia | 10 | 2 |
| Antigenemia | 0 | 0 |
| Death | 0 | 0 |

Table 3. Odds of Hepatitis B Reactivation as a Function of Various Risk Factors.

| Risk Factor | Odds Ratio | 95% Confidence Interval | P Value |
|-------------|------------|-------------------------|---------|
| Age < 50 | 3.2 | 1.0-9.8 | 0.05 |
| Race | 2.6 | 1.1-5.7 | 0.02 |
| Sex | 1.7 | 0.8-3.7 | 0.15 |
| Drug use | 2.2 | 1.1-4.3 | 0.03 |
| Hepatitis C | 2.1 | 1.1-3.9 | 0.03 |

Table 4. Odds of Hepatitis B Reactivation as a Function of Various Risk Factors.

| Risk Factor | Odds Ratio | 95% Confidence Interval | P Value |
|-------------|------------|-------------------------|---------|
| Age < 50 | 3.2 | 1.0-9.8 | 0.05 |
| Race | 2.6 | 1.1-5.7 | 0.02 |
| Sex | 1.7 | 0.8-3.7 | 0.15 |
| Drug use | 2.2 | 1.1-4.3 | 0.03 |
| Hepatitis C | 2.1 | 1.1-3.9 | 0.03 |

Disclosures. All authors: No reported disclosures.
Background. Several cases of severe bacterial, fungal, and viral infections have been reported following ibrutinib therapy. Here, we report a case of a patient with non-Hodgkin lymphoma who developed hepatitis B virus (HBV)-associated liver failure after anti-cancer treatment most recently with ibrutinib. We also review reported cases of HBV reactivation (HBVr) after ibrutinib.

Methods. We searched the Medline and Embase databases and identified 5 patients with HBVr related to ibrutinib for a total of 6 study patients, including our case (figure). HBV-related outcomes were defined according to the 2018 AASLD HBV guidance document.

Results. All 6 patients were men and most (5 or 83%) had chronic lymphocytic leukemia and past HBV infection (table). Three patients (50%) developed HBVr and 2 of them progressed to liver failure. Four patients (67%) had a remote history (≥24 months) of other potential risk factors besides ibrutinib that could contribute to HBVr, including the use of direct-acting antivirals for hepatitis C co-infection (1 pt), hematopoietic cell transplant (HCT) (1 pt) and rituximab use (4 pts). HBVr occurred at least 6 months after initiation of ibrutinib in most patients (4 or 67%), with a median of 9.7 months (range, 1.5–42). In all 4 patients pretreated with rituximab, that treatment was completed at least 24 months before HBVr. Two of these patients received anti-HBV prophylaxis that was stopped 12 months after the completion of rituximab; the other 2 patients were only monitored without antivirals. The HCT recipient received anti-HBV prophylaxis per guidelines. None of the 6 patients treated with ibrutinib were receiving anti-HBV prophylaxis at the time of HBVr, but 5 patients were started on anti-HBV drugs at the first sign of HBVr. Four received entecavir and 1, tenofovir. All treated patients recovered from HBVr. No pt died of HBVr.

Conclusion. Life-threatening HBVr can occur following ibrutinib therapy in patients with past or chronic HBV infection. The temporal association between ibrutinib therapy and reactivation indicates that ibrutinib is the likely cause of the HBVr, and clinicians should be aware of the risk of HBVr in these patients. A provisional approach to HBVr, including the use of direct-acting antivirals for hepatitis C co-infection, could be HBV monitoring at regular intervals with initiation of antiviral therapy at the earliest sign of HBV reactivation.

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289. Importance of Universal Screening for Hepatitis B in Cancer Patients: Quality Improvement Project in Japan

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