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Hepatitis B Vaccination among a National Sample of Gay and Bisexual Men

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Abstract

Less than half of gay and bisexual men indicated they had received any doses of hepatitis B virus (HBV) vaccine. HBV vaccination was higher among men who were 18-29 years old (compared to those 50-59 years old), gay, or had received flu vaccine within the last year.

Hepatitis B virus (HBV) infection is of particular concern for gay and bisexual men, as 11%-20% have serological evidence of past or current infection.[1-4] HBV vaccine was recommended for groups at high risk for infection in 1985, including men who have sex with men.[5] The Advisory Committee on Immunization Practices (ACIP) continues to recommend HBV vaccination for high-risk individuals, as well as any other adult who wants the vaccine.[6] Despite these recommendations, only 9% to 42% of gay and bisexual men in the US have received any doses of HBV vaccine.[3,7-12] Many of these studies, however, used convenience sampling from only one geographic area, and it has been almost a decade since data for the most recent of these studies were collected. In the interim, new programs integrating HBV vaccination into STD clinic services, HIV testing, and syringe exchange programs have been implemented as a way to increase HBV vaccination among gay and bisexual men and other high-risk adults.[13-17] In this report, we characterize recent HBV vaccination rates among a national sample of gay and bisexual men.

The University of North Carolina Men's Health Survey interviewed men aged 18-59 years who were members of an existing national panel of U.S. households. The survey company identified prospective panel members using list-assisted, random-digit dialing of landline phones. Upon recruitment into the panel, the company collects demographic information, including self-reported sexual orientation, through a background survey. Panel members receive emails inviting them to complete multiple internet-based surveys each month, for which they receive free internet access. Panel members with existing computer and internet access accumulate points for completing surveys, which can be redeemed for small cash payments.

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In January 2009, we randomly sampled male panel members who had reported their sexual orientation in their background survey, oversampling men who self-identified as either gay or bisexual. Of 874 men invited to participate, 609 (70%) completed our cross-sectional, online survey.[18] Response rates were higher among gay and bisexual men compared to heterosexual men (79% vs. 62%). We report data from 306 men who self-identified as either gay or bisexual, excluding all other participants. The Institutional Review Board at our university approved the study.

We assessed HBV vaccination by asking, "The hepatitis B vaccine is a series of three shots. How many hepatitis B vaccine shots, if any, have you had?" Response options included "none", "one", "two", "three", "at least one shot, but don't know how many," and "I don't know if I had any shots". We classified participants as "vaccinated" (one or more doses received including those who indicated at least one shot but unsure of how many) or "not vaccinated" (all other responses). Although primary HBV vaccination for adults consists of three doses,[6] we defined vaccination as receipt of one of more doses since adequate immunity can develop in some individuals with fewer than three doses,[6,19,20] and because some younger participants may have received the two-dose adolescent HBV vaccine regimen.[21]

Participants provided information on demographic variables and health behaviors (Table 1). We assessed sexual orientation by asking, "Do you think of yourself as….." with response options of "gay or homosexual (attracted to men)", "bisexual (attracted to men and women)", "heterosexual or straight (attracted to women)", "something else", and "not sure". We defined "urban" as living in a metropolitan statistical area (MSA) and "rural" as living outside of an MSA.[22] Participants provided self-reported histories of infection with human immunodeficiency virus (HIV), HBV, and any other sexually transmitted infections (STIs).

Analyses excluded 14 men with a self-reported history of HBV infection, resulting in an analytic sample size of 292. We used logistic regression to examine bivariate correlates of HBV vaccination. Statistically significant bivariate correlates ($p<0.05$) were simultaneously entered into a multivariate logistic regression model. We analyzed unweighted data using SPSS version 17.0 (SPSS Inc., Chicago IL). All statistical tests were two-tailed, using a critical alpha of 0.05.

Most participants were non-Hispanic white (80%), less than 50 years old (61%), had a college degree (55%), and reported a household income of at least $60,000 (60%). Most men had not initiated sex before age 16 (64%), indicated five or more lifetime sexual partners (88%), and fewer than five male sexual partners in the last year (75%). Sixty-one percent had disclosed to their primary healthcare provider that they have had sex with men, 16% reported a history of HIV infection, and 30% reported a history of other STIs.

Overall, 46% (133/292; 95% confidence interval [CI]: 40%–52%) of men indicated they had received one or more doses of HBV vaccine. Most men reporting HBV vaccination indicated they had received three doses (71%, 95/133), with fewer reporting two doses (5%, 7/133), one dose (6%, 8/133), or at least one dose but unsure of how many (17%, 23/133). Among men considered to be unvaccinated (n=159), 114 indicated they had received no doses, 43 did not know if they had received any does, and 2 had missing data.

In multivariate analyses (Table 1), HBV vaccination was higher among men aged 18-29 years compared to men aged 50-59 years (odds ratio [OR]=10.00, 95% CI: 2.36–42.36). HBV vaccination was also higher among men who self-identified as gay (OR=2.03, 95% CI: 1.03–3.99) or had received flu vaccine within the last year (OR=1.88, 95% CI: 1.10–3.19). We conducted extensive sensitivity analyses to explore the effect of classifying men who did not know if they had received any does of HBV vaccine or had missing data as "not

vaccinated". Multivariate correlates did not differ greatly in these analyses, giving us confidence in our findings.

Less than half of gay and bisexual men in this national sample indicated receiving any doses of HBV vaccine, a rate only slightly higher than previous estimates among this population (31%-42%)[7-10,12] and males in general in the US (30%).[23] Our results provide an important update and suggest HBV vaccination in this high-risk population remains suboptimal. This may be partly attributable to the lack of a national program for vaccinating uninsured or underinsured adults and low usage of reimbursement programs among insured adults.[6] Recent programs have sought to overcome these obstacles and reach high-risk adults. Integration of HBV vaccination into STD clinic services, HIV testing, and syringe exchange programs has been mostly successful in increasing vaccination rates.[13-17] One such program achieved 81% coverage (one or more doses) among men who have sex with men who were return clients to an STD clinic.[14] Greater availability of these programs and novel approaches for reaching gay and bisexual men who do not attend these venues are needed.

Similar to past studies,[8,9] younger men reported HBV vaccination more frequently. This likely reflects US national recommendations to vaccinate children and adolescents against HBV (occurred in 1991 and 1997, respectively[24,25]) and HBV vaccine school mandates. Currently, 46 states have elementary or middle school mandates for HBV vaccination,[26] and 19 states have some type of mandate for college entry.[27] These policies would likely not have been in effect for men over age 30 in our study. Since more than 80% of people aged 40 and older produce a protective antibody response after three doses of HBV vaccine,[28] older gay and bisexual men can still benefit from vaccination.

HBV vaccination was higher among gay men compared to bisexual men, as in past research.[9] One potential explanation is that more gay men than bisexual men had disclosed to their primary care providers that they have had sex with men (73% vs. 22%, $p<0.001$), causing healthcare providers to recognize the need for and recommend HBV vaccination. Healthcare providers should provide environments that facilitate both gay and bisexual men disclosing their sexual behaviors, possibly by posting non-discrimination statements in their clinics and using gender-neutral language about sexual partners.[29] Lastly, HBV vaccination was more common among men reporting flu vaccination within the last year, possibly due to their greater use of health services or higher acceptability of vaccines in general.

Our study has several important strengths including the use of a national sample, a high participation rate, and focusing on a high-risk population. Limitations include a cross-sectional study design and self-reported HBV vaccination, though most gay men accurately recall their HBV vaccination status.[2] We did not have data on medical conditions that may contraindicate HBV vaccination or on some factors that may indicate vaccination (*e.g.*, history of drug use). Also, 60 men did not have data available on prior HBV infection, though it is likely only a few had been previously infected. Data did not allow for examination of history of individual STIs other than HIV. Although our sample came from a study panel that closely resembles the U.S. population,[30,31] most participants were older than 30 years of age, non-Hispanic white, and of high socioeconomic status. At the time of our study, the survey company recruited panel members only using list-assisted, random-digit dialing of landline phones. Despite these limitations, our study provides a needed update on HBV vaccination rates among gay and bisexual men in the US. Results indicate vaccination rates remain suboptimal and suggest continued efforts to ensure vaccination are needed.

Short Summary

Among a national sample of gay and bisexual men, we found less than half indicated they had received one or more doses of hepatitis B virus (HBV) vaccine.

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Table 1

Correlates of HBV vaccination among gay and bisexual men (n=292)

	No. Received HBV Vaccine / Total No. in Category (%)	Bivariate OR (95% CI)	Multivariate OR (95% CI)
Demographic Characteristics			
Age (Years)			
18-29	11/14 (79)	5.54 (1.46-20.97)*	10.00 (2.36-42.36)**
30-39	23/45 (51)	1.58 (0.79-3.17)	1.83 (0.88-3.83)
40-49	54/120 (45)	1.24 (0.73-2.08)	1.25 (0.73-2.16)
50-59	45/113 (40)	ref.	ref.
Sexual Self-Identity			
Bisexual	20/68 (29)	ref.	ref.
Gay	113/224 (50)	2.44 (1.36-4.38)**	2.03 (1.03-3.99)*
Race / Ethnicity			
White, Non-Hispanic	105/233 (45)	0.91 (0.51-1.61)	--
Other Race / Ethnicity	28/59 (48)	ref.	--
Marital Status			
Divorced, Widowed, Separated, Never Married	64/156 (41)	ref.	--
Living with Partner or Married	69/136 (51)	1.48 (0.93-2.35)	--
Education			
No College Degree	54/131 (41)	ref.	--
College Degree	79/161 (49)	1.37 (0.86-2.19)	--
Annual Household Income			
<$60,000	48/118 (41)	ref.	--
≥$60,000	85/174 (49)	1.39 (0.87-2.23)	--
Employment Status			
Not Currently Employed	22/59 (37)	ref.	--
Currently Employed	111/233 (48)	1.53 (0.85-2.75)	--
Health Insurance Status			
No	14/43 (33)	ref.	--
Yes	119/249 (48)	1.90 (0.96-3.76)	--
Urbanicity			
Rural	8/20 (40)	ref.	--
Urban	125/272 (46)	1.28 (0.51-3.22)	--
Region of Residence			
Northeast	21/43 (49)	ref.	--
Midwest	33/70 (47)	0.93 (0.44-2.00)	--
South	46/104 (44)	0.83 (0.41-1.69)	--
West	33/75 (44)	0.82 (0.39-1.75)	--
Health and Health Behaviors			
Received Flu Vaccine Within the			

	No. Received HBV Vaccine / Total No. in Category (%)	Bivariate OR (95% CI)	Multivariate OR (95% CI)
Last Year			
No / Missing	83/200 (42)	ref.	ref.
Yes	50/92 (54)	1.68 (1.02-2.76)*	1.88 (1.10-3.19)*
Age at First Sexual Intercourse (Years)			
<16	49/106 (46)	1.04 (0.65-1.69)	--
≥16	84/186 (45)	ref.	--
Number of Lifetime Sexual Partners (Vaginal, Anal or Oral Intercourse)			
<5	16/35 (46)	ref.	--
≥5	117/257 (46)	0.99 (0.49-2.02)	--
Number of Male Partners (Anal or Oral Intercourse) in Last Year			
<5	97/218 (45)	ref.	--
≥5	36/74 (49)	1.18 (0.70-2.00)	--
Disclosed Sex with Men to Primary Healthcare Provider			
No	26/76 (34)	ref.	ref.
Yes	95/178 (53)	2.20 (1.26-3.85)**	1.70 (0.89-3.24)
Not Applicable / Missing	12/38 (32)	0.89 (0.39-2.04)	0.76 (0.32-1.85)
Most Recent HIV Test			
Within the Last Year	53/98 (54)	1.68 (1.03-2.74)*	1.31 (0.77-2.23)
Not Within the Last Year	80/194 (41)	ref.	ref.
HIV Status			
Negative	107/245 (44)	ref.	--
Positive	26/47 (55)	1.60 (0.85-2.99)	--
Other Prior STI			
No	90/203 (44)	ref.	--
Yes	43/89 (48)	1.17 (0.71-1.93)	--

Note. Vaccination defined as receipt of one of more doses of HBV vaccine. The multivariate model did not include variables with dashes (--). HBV = hepatitis B virus, OR = odds ratio, CI = confidence interval, ref. = referent group, HIV = human immunodeficiency virus, STI = sexually transmitted infection.

* $p<0.05$

** $p<0.01$