HEPATITIS A VACCINATION AMONG YOUNG AFRICAN AMERICAN MEN WHO HAVE SEX WITH MEN IN THE DEEP SOUTH: PSYCHOSOCIAL PREDICTORS

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Despite recommendations for vaccination against hepatitis A (HAV) of men who have sex with men (MSM), most remain unvaccinated. This study was designed to identify attitudes and beliefs associated with vaccination against HAV using a conventional outreach sample of African American MSM in Birmingham, Alabama.

Of 107 participants, nearly 34% reported being vaccinated against HAV. Over half of the participants reported 10 or more different lifetime male sexual partners, and a third reported having had intercourse with females, as well as, males within the past 5 years. About 10% of the participants reported condom use over half of the time during oral intercourse, and 50% of the participants reported using a condom over half the time during anal intercourse.

In multivariable analysis, predictors of HAV vaccination were a decreased perception of the practical barriers to HAV vaccination (odds ratio [OR], 0.05; 95% confidence interval [CI]: 0.01-0.18, P=0.002); increased health provider communication (OR, 9.89; 95% CI: 2.74-35.65, P=0.02); and increased perceived personal self-efficacy to complete the two-dose series (OR, 7.31; 95% CI: 2.38-22.45, P=0.02).

Our findings underscore the need to increase vaccination through innovative approaches to reduce perceived barriers to vaccination while increasing provider-patient communication and self-efficacy to complete the vaccine series.

Key words: gay ◆ hepatitis ◆ vaccination ◆ African American ◆ homosexual

While the prevalence of hepatitis A virus (HAV) infection is relatively low in the general population within developed nations such as the United States (US),[1] numerous reports have documented outbreaks of HAV among men who have sex with men (MSM).[2-4] With an effective two-dose vaccine available, HAV remains an important vaccine-preventable disease in the United States,[5] and the Centers for Disease Control and Prevention recommend the universal vaccination against HAV of MSM.[6]

Clinical manifestations of HAV are age-related, with increased age at acquisition being associated with more severe disease. For example, only 5-20% of children under 5 years of age develop icteric disease; the majority of these children exhibit many asymptomatic transient infections.[7] However, the occurrence of fatal fulminant hepatitis increases with age at infection,[1] and the occurrence of hepatitis A in older patients as well as those with underlying chronic liver disease (such as chronic hepatitis B or C infection) is associated with increased mortality.[2-5,8]

In addition to clinical morbidity and mortality, HAV exerts an important economic burden. Adults who become ill lose an average of 27 days of work due to the disease. Between 11% and 22% of persons who have hepatitis A infection are hospitalized.[6] Average costs associated with hepatitis A infection range from $1,817 to $2,459 per case for adults.[6] In one common-source outbreak in the US among 43

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persons, the estimated total societal cost was approximately $800,000.[9] In 1989, the estimated annual direct and indirect costs of hepatitis A infection in the US were more than $200 million, equivalent to over $300 million in 1997 dollars.[10] In the US, and in other countries of low endemicity, exposure to HAV tends to be at an older age, resulting in increased morbidity and economic impact from this disease.

Unfortunately, little is know about the predictors of HAV vaccine acceptance. Moreover, specific populations such as African American MSM have been neglected in the behavioral literature with respect to understanding vaccination against diseases such as hepatitis B.[11] In order increase vaccination rates, a thorough understanding of vaccine behavior among different racial and ethnic groups is necessary as an antecedent to developing targeted or tailored intervention strategies. In this study, we explored the psychosocial variables that may affect HAV vaccination acceptance within a conventional outreach sample of young African American MSM. Findings from this study may inform intervention efforts to increase HAV vaccination rates among African American MSM, as well as, inform future interventions designed to enhance vaccination within this population should vaccines against the human immunodeficiency virus (HIV) and hepatitis C become available.

METHODS

Data Collection Procedures

During November 2001, data were collected anonymously in a predominantly African American, "gay" male bar in Birmingham, Alabama, USA. All bar patrons were asked to participate, regardless of gender, by a trained recruiter. In order to ensure informed consent, the recruiter assessed sobriety of potential participants using established criteria.[12] Questionnaires were self-administered and completed in secluded areas of the bars to enhance participants' valid reporting of sensitive behaviors. Participants were compensated $10 for completing the survey. Data collection ended at 11:30 p.m. each night. The data were entered into an electronic database using double-entry procedures to assess and validate accuracy.

Measures

The questionnaire included 64 items. Items measured participants' sociodemographics, including age, race/ethnicity (American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian/Pacific Islander or Caucasian/white), educational attainment, estimated yearly income, and health insurance coverage.

Sexual risk was measured by items that assessed the frequency of condom use during oral and anal intercourse with a male partner within the past 3 months, the number of sexual partners during the past 30 days and lifetime, and anal-oral sexual contact ("rimming"). Items assessed whether participants had ever received a positive HIV-serological test result and whether participants had ever, or in the past 5 years, been told that they had HIV or other sexually transmitted diseases.

Items measured non-sexual risk behaviors as well, including participant history of injecting drugs or steroids, sharing injecting-drug equipment, and receiving blood or blood products.

Items assessed participant history of HAV awareness, vaccination, testing, and treatment. Because the goal of this study was to examine vaccine uptake and not second dose compliance, vaccination against HAV was measured based on self-report of vaccination, regardless of completion of the two-dose series.

Theory-based, psychosocial predictors, based on the health belief model[13,14] and the social cognitive theory,[15] specifically related to HAV vaccination were measured using 32 items comprising seven scales that have been identified through rigorous psychometric scale development in a study of African American and white MSM.[16] Briefly, measurement development using the diverse sample of 358 MSM followed a two-step process. First, standard procedures of principal component analysis (PCA) with Varimax rotation employed to determine a factor structure for each scale on a slit half sample (n=179). The scree test,[17] eigenvalues,[18] the interpretability of the factors,[19,20] theoretical considerations,[21] factor loadings,[17-20] and Cronbach's coefficient alpha[22] were used to define all factor structures. The remaining split-half ("hold-out") sample (n=179) was used for instrument confirmation analyses using AMOS,[23] a statistical package that is commonly used for structural equation modeling (SEM). Confirmatory factor analysis (CFA) via SEM recently has become one of the primary meth-

ods of choice for measurement development. CFA recognizes the role of theory for establishing a structural model that organizes scale and subscale development. CFA permits evaluating the adequacy of a proposed factor structure.[24-26] The scales, number of items per scale, sample items, and alpha coefficients for the current study sample are presented in Table 1.

A final item assessed whether participants had completed the questionnaire previously. The response categories for each item within the questionnaire used binary, categorical or Likert-scale responses to facilitate readability and administration.

Statistical Analyses

SPSS for Windows 10.1 (Chicago, IL) was used for data analysis. Kolmogorov-Smirnov one-sample test was preformed to test whether the data were normally distributed. All distributions were normal at $P<.05$.

All theory-based scales, measuring the psychosocial predictors, were dichotomized using median split and entered into a multivariable logistic regression model to test the independent contribution of each of the predictors while adjusting for the other predictors in the model.[27] Accordingly, adjusted odds ratios (OR) and 95% confidence intervals were calculated to assess the magnitude of association between theory-based predictors and self-reported vaccination.

RESULTS

Sample Demographics

Of the 120 MSM participants who completed the survey, 107 self-identified as African American or black; 5 self-identified as Hispanic or Latino; 4, as Native American; 4, as white. Of the 107 African American participants, the mean (± SD) age was 24.8 ± 5.93 years, with a range of 18 to 50 years. The majority of participants reported yearly income of $20,000 or more (61.4%), some college or above (57.9%), and having private health insurance (57.9%).

Hepatitis Risk

Nearly 34% (n = 36) reported being vaccinated against HAV. Over half of the participants reported 10 or more different lifetime male sexual partners (n = 69), and fewer than half reported 2 or more different male sexual partners within the past 30 days (n = 43). Nearly a third (n = 32) reported having had intercourse with females as well as males within the past 5 years.

When asked what percent of the time they used condoms during intercourse, 11.3% of the participants reported condom use over half of the time when performing or receiving oral intercourse, and 50% of

Table 1. Description of Scale Measures

Scale Measure and Sample Item	Number of Items	α
Perceived practical barriers to HAV vaccination *Sample: "I don't have time to get vaccinated against hepatitis A."*	5	0.73
Health care provider communication *Sample: "I can talk freely with my doctor or health care provider about my sexual behavior."*	3	0.68
Perceived benefits of HAV vaccination *Sample: "Getting vaccinated against hepatitis A infection would be a good way to protect my health."*	5	0.86
Perceived severity of HAV infection *Sample: "How serious would it be for you to get infected with hepatitis A?"*	4	
Perceived susceptibility to HAV infection *Sample: "People like me don't get hepatitis A."*	5	0.74
Perceived general medical self-efficacy to complete the 2-dose vaccine series *Sample: "How sure are you that you could get 2 shots of the hepatitis A vaccination, if you have a fear of needles or shots?"*	3	0.85
Perceived personal self-efficacy to complete the 2-dose vaccine series *Sample: "How sure are you that you could get the hepatitis A vaccination, if you are embarrassed to talk about sex with a doctor or healthcare provider?"*	7	0.93

the participants reported using a condom over half the time during insertive or receptive anal intercourse. Nearly 60% of participants (n = 62) reported engaging in unprotected anal-oral contact ("rimming").

Over 11% (n = 12) of this sample reported a lifetime history of at least one STD diagnosis, excluding seropositivity for HIV, and 6.5% (n = 7) reported that they had received at least one STD diagnosis within the past five years. Almost 5% (n = 5) reported a positive HIV antibody test result. Almost 6% (n = 6) of the sample reported having received blood or blood products before 1992, and 5.6% (n = 6) reported ever having injected drugs or steroids; only two participants reported ever having shared injecting drug equipment.

ATTITUDES AND BELIEFS ABOUT HAV INFECTION AND VACCINATION

Table 2 displays the odds ratio, 95% confidence interval and significance level between HAV vaccination and the independent contribution of each psychosocial predictor. Of the seven psychosocial predictors entered into the multivariable model, three were associated with HAV vaccination. The predictive power of the model ($x2 = 38.07$; P = .0001) was high, correctly classifying 80% of the participants into their self-reported vaccination status categories.

Participants who perceived low levels of practical barriers to HAV vaccination were over 90% more likely to be vaccinated against HAV than those who perceived high levels of practical barriers to HAV vaccination. Similarly, participants who reported high levels of health care provider communication about sexual orientation and risk behaviors were over nine times more likely to be vaccinated against HAV. Participants who reported high levels of personal self-efficacy to complete the two-dose series were seven times more likely to self-report HAV vaccination than those who reported low levels of personal self-efficacy to complete the series.

DISCUSSION

Enhancing awareness and facilitating vaccination among populations at risk for HAV infection are urgently needed. About a third of this sample was vaccinated, and another third reported knowing nothing about hepatitis. Furthermore, many participants reported engaging in behaviors that put them and their sexual partners at risk for hepatitis A infection. The low level of vaccination and the high levels of risk behaviors, such as inconsistent condom use and anal-oral contact ("rimming"),[28] suggest that the failure to vaccinate this high-risk population is a missed opportunity to prevent disease.

Within this sample of African American MSM, lower scores for perceived practical barriers to HAV vaccination were associated with HAV vaccination. Thus, interventions to increase vaccination among unvaccinated MSM may focus on increasing knowledge about hepatitis A infection and HAV vaccination, identifying convenient locations for vaccination administration, and reducing the out-of-pocket expense of vaccination against HAV.

Furthermore, this study, like studies with samples of predominately white MSM exploring predictors of hepatitis B vaccination,[11] found an association between vaccination and health care provider communication about patient sexual orientation and risk. Thus, to increase HAV vaccination among African American MSM, strategies must be developed to facilitate increased provider communication with patients to ensure patient disclosure of risk and accurate risk assessment. Because recommendation by a health care provider is a strong predictor of preventive behavior,[29] providers must inform patients about the efficacy and safety of the vaccine to encourage vaccination among MSM. Environments must be created that build trust and allow risk disclosure. Some providers are beginning to experiment with delivering patient education and interactive risk assessment through computer technology.[30] Such applications may provide "cues for action" for patients to either discuss risks with or seek vaccination from their health care providers.

Interestingly, the perceived benefits of vaccination were not associated with HAV vaccination. This finding may reflect "AIDS fatigue," a phenomenon in which MSM become weary of HIV and AIDS messages through overexposure.[31] This phenomenon has been linked with decreased attention and adherence to HBV vaccination messages. Innovative, sex-positive vaccination promotion efforts may be key to increasing rates of HAV vaccination among MSM.

Perceived personal self-efficacy, which in this case can be defined as one's judgment of one's capacity to become vaccinated against HAV, was also found to be

predictive of vaccination status in the multivariable model. Participants who reported more confidence in overcoming embarrassment of talking about their sexual behavior with providers, overcoming worries about HAV vaccine safety and rumored side effects, and overcoming concerns such as time and money were seven times more likely to report HAV vaccination than those who reported less confidence in overcoming these concerns. Thus, intervention strategies must include components that focus on increasing the self-efficacy of unvaccinated African American MSM. Lay health advisory networks or well-tailored communication campaigns may encourage vaccination against HAV through peer leaders or role modeling. The peer leader approach has been shown to be successful in HIV prevention intervention design among MSM,[32] and could be tested empirically for the promotion of HAV vaccination. Role modeling through multimedia communication campaigns also has been found efficacious with HIV prevention efforts[33] and also may inform strategies to increases HAV vaccination among African American MSM.

LIMITATIONS

The present study is not without limitations. First, the observed associations are based on cross-sectional data. Additional studies using a prospective cohort design will be necessary to evaluate the significance and stability of these findings over time. Furthermore, the results of this study may not apply to the general population of MSM. However, the degree of fit between a sample and a target population about which generalizations can be made is a common challenge in many studies; in fact, nearly all studies of sexual behavior among MSM are based on non-random, self-selected samples.[34]

Furthermore, although we utilized a self-administered format that may minimize response bias, and included techniques found to increase validity of self-reported behavior.[35] These results remain based on self-reported data with their potential limitations.[36]

CONCLUSIONS

Understanding HAV vaccination among African American MSM is not only crucial for the development and evaluation of tailored interventions aimed at increasing vaccination against HAV, but also provides the framework for developing future vaccination strategies for diseases such as HIV and hepatitis C. While we report psychosocial predictors of HAV vaccination based on a sample of African American MSM, a group about whom much behavioral data are lacking,[11] subsequent studies must explore further the potential impact of increased access to heath care; reduced costs for vaccination services; and vaccination opportunities in untraditional venues such as bars, bath houses, coffee shops, gyms, or house parties.

Much is still unknown about the factors that influence MSM vaccination behavior. Focus must be placed on increasing understanding of the factors that affect vaccination acceptance in order to develop innovative and well-tailored strategies to increase vaccination rates among MSM.

Table 2. Characteristics Independently Associated With Self-Reported Hepatitis A Vaccination

Characteristic	Adjusted Odds Ratio	(95% CI)	P Value
Practical barriers to HAV vaccination	.05	(0.01-0.18)	.002
Health care provider communication	9.89	(2.74-35.65)	.02
Perceived benefits of HAV vaccination	1.93	(0.63-5.91)	.45
Perceived severity of HAV infection	2.24	(0.99-5.08)	.21
Perceived susceptibility to HAV infection	.71	(0.32-1.60)	.59
Perceived general medical self-efficacy to complete the 2-dose series	.95	(0.29-3.09)	.95
Perceived personal self-efficacy to complete the 2-dose series	7.31	(2.38-22.45)	.02

Note: 95% CI = 95% confidence interval

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