Alcohol's Effects on Requisites for Sexual Risk Reduction in Men: An Initial Experimental Investigation

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The effects of alcohol intoxication on mediators of condom use were examined in a laboratory-based experiment. Twenty men were randomly assigned to either an alcohol or a nonalcohol beverage administration condition. Participants in the experimental condition drank vodka and tonic to achieve a blood alcohol level of 0.08%, whereas controls drank tonic only. All participants then completed a battery of measures related to condom and AIDS-related knowledge, motivation to use condoms, and behavioral self-efficacy regarding condom use. Findings from this exploratory study, which should be considered preliminary because of the small sample size, indicated that participants who received alcohol tended to report more negative attitudes toward condoms and lower self-efficacy to initiate condom use than controls. AIDS knowledge, appraisal of social norms regarding condom use, and perceived risk of infection were unaffected by alcohol consumption.

Key words: HIV/AIDS, alcohol, condoms

Current prevention campaigns warn of the dangers of combining alcohol and sex (e.g., "Get drunk, get high, get AIDS"). Concerns about the association between alcohol use and risky sexual behavior have emerged from several sources. For example, alcohol use and sexual activity have been shown to frequently co-occur (Temple & Leigh, 1992), and alcohol use has been associated with increased risk for HIV transmission in some studies (e.g., Kelly, St. Lawrence, & Brasfield, 1991; Trocki & Leigh, 1991). Also, individuals often hold expectancies about alcohol's effects on sexual behavior, and such expectancies may influence sexual choices after drinking (Leigh, 1990). Furthermore, alcohol has been associated with elevated risk behavior in other domains (e.g., driving; McMillen, Smith, & Wells-Parker, 1989). However, not all survey data have documented an association between alcohol and risky sex (cf. Leigh & Stall, 1993).

Inferences about such equivocal findings have been limited because the types of correlational designs used to date have not allowed for attribution of causality. Moreover, previous experimental research regarding alcohol use and sexual behavior (for a review, see Crowe & George, 1989) has not focused on HIV-related risk taking. If understanding of the purported alcohol–risky sex association is to be advanced, there is a need for both (a) longitudinal research using more sophisticated measurement and analytic strategies (e.g., path models) and (b) experimental study of the acute effects of alcohol use on mechanisms through which alcohol may affect sexual choices and behavior.

The purpose of this investigation was to evaluate, using a controlled experimental design, the effects of acute alcohol intoxication on HIV-relevant variables. Because ethical, moral, and legal considerations prevent the direct study of sexual behavior, we investigated alcohol's effects on variables hypothesized to mediate risky sexual behavior, namely, HIV-related information, motivation, and behavioral skills (the IMB model; cf. Fisher & Fisher, 1992). The IMB model was used as a heuristic to guide the selection of dependent measures. In prior research guided by the IMB model, the variables just mentioned have been predictive of safer sexual behavior among gay men and heterosexual college students (Fisher, Fisher, Williams, & Malloy, 1994). Conceptually, the variables fit well in a situational formulation of sexual risk behavior. If a drinking event increases sexual risk taking, then participants who consume alcohol might be expected to evidence lower HIV-related knowledge, decreased motivation for condom use, and reduced self-efficacy to enact interpersonal risk-reduction behaviors relative to participants who are not given alcohol.

Method

Participants

Twenty men from the community received $30 to participate; on average, they were young (M age = 28 years), well educated (M = 14.5 years), Caucasian (80%), single (75%), and sexually experienced (100%). Regarding sexual risk characteristics, the majority of men (55%) had had multiple sexual partners in the previous year (M = 4.2),

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and only one third reported consistent condom use in the previous month. Sixteen (80%) participants were classified as either moderate or heavy drinkers with the Quantity–Frequency–Variability Index (Cahalan, Cisin, & Crossley, 1969), and most (80%) reported at least one occasion in the previous year on which they had had intercourse after "drinking too much" ($M = 4.3$). Participants were excluded if they did not have experience with the alcohol dose to be administered.

Procedure

Participants were recruited with posted flyers and newspaper advertisements seeking participants for a "male health study." This was done to avoid recruiting a sample biased by a strong interest in alcohol or sexuality research. Respondents were screened during an initial session to exclude those with (a) any medical condition that contraindicated alcohol administration, (b) suspected alcoholism according to the Short Michigan Alcoholism Screening Test (Selzer, Vinokur, & van Rooijen, 1975), or (c) acute psychopathology. Participants were then randomly assigned to either an alcohol or a no-alcohol condition.

A subsequent experimental session was scheduled in the late afternoon of another day. Participants were told not to eat 3 hr before the session and not to consume alcohol, drugs, or nonprescription medication for 12 hr before the session. On arrival, participants' initial blood alcohol level (BAL) was determined, and participants were weighed. Following standard alcohol administration procedures (Marlatt & Rosenhow, 1980), alcoholic beverages contained four parts tonic to one part 80-proof vodka. The target BAL for the alcohol condition was 0.08%, and alcohol dose was based on weight. In the control condition, beverages consisted of five parts tonic. All drinks contained ice and lime juice. Participants were informed of the contents of their drinks and consumed the beverages in 30 min, taking equal time for each drink. Reading materials were available, and participants remained seated.

To confirm that the target BAL was reached after a 20-min absorption period and every 20 min for the remainder of the session, we took a breathalyzer (Alcosensor®) reading. Participants also estimated their level of intoxication, on a 12-point scale ranging from *not at all* (0) to *more intoxicated than ever before* (11), and the amount of alcohol that they had consumed. Participants then completed the measures. Sober participants were debriefed and dismissed. Participants who had consumed alcohol remained until their BAL reached 0.02%; they were given an estimate of the time required for their BAL to reach zero and were escorted home.

Measures

AIDS-relevant information was operationalized as the summary score from the AIDS Risk Knowledge Questionnaire (Kelly, St. Lawrence, Hood, & Brasfield, 1989b), a 40-item, standardized, reliable (test–retest $r = .84$) true–false measure. Motivation was assessed by measuring attitudes toward condoms, decisional balance regarding condom use, social norms, and risk perception. The Multidimensional Condom Attitudes Scale (Helweg-Larson & Collins, 1994), which contains 25 statements about condoms and yields five attitude scores (reliability of condoms, pleasure of condom use, identity stigma associated with condom use, embarrassment about negotiation and use of condoms, and embarrassment about the purchase of condoms), was used in assessing attitudes toward condoms. A decisional balance measure regarding condom use was used as a second index of motivation (cf. Prochaska et al., 1994). On this 10-item scale, respondents rated the importance of each of five advantages and five disadvantages in their decisions about condom use. Indexes of perceived social norms for condom use were obtained by asking participants to indicate what their friends, main sexual partner, and other sexual partners believed that the respondent should do about condom use and the extent to which the respondent wanted to behave as these social referents desired. Respondents assessed their risk for HIV infection on the basis of their sexual activity in the previous year and their expected sexual activity in the next year.

In previous research guided by the IMB model, Fisher et al. (1994) operationalized behavioral skills as self-efficacy for specific preventive actions (e.g., condom use). Therefore, three self-efficacy items were used for (a) initiating discussion of condom use with a new partner, (b) insisting on condom use if the partner did not want to use a condom, and (c) refusing sexual activity if condoms were not to be used. Participants estimated their confidence that they could engage in each behavior "right now" on 10-point scales ranging from *cannot do at all* (1) to *certain can do* (10; Murphy, Multhauf, & Kalichman, 1995).

Results

First, participants in the two groups were compared on baseline variables; there were no differences in age, education, relationship status, sexual partners in previous year and month, usual condom use, or usual drinking patterns. Second, breathalyzer readings confirmed that BALs were at the target level before ($M = 0.083\%$) and after ($M = 0.084\%$) participants in the alcohol group completed the measures. For intoxicated participants, estimates of "how drunk" they were ($M = 6.3$) and the number of drinks they had consumed ($M = 5.2$) were consistent with the moderately high dose. Controls responded with zeros for these measures. Third, to evaluate the effects of alcohol use on the HIV-related measures, we conducted two-sample t tests for each measure. Table 1 displays the dependent measures by alcohol condition.

AIDS knowledge, risk perception, perceptions of others' opinions about condoms, and motivation to comply with relevant others' opinions did not vary as a function of alcohol condition. However, participants' attitudes about condom use did vary as a function of alcohol condition. Participants who received alcohol exhibited less favorable attitudes about (a) negotiating for condom use with a partner (i.e., more embarrassment), $t(18) = 2.14$, $p = .02$, and (b) the pleasures associated with condom use, $t(18) = 1.89$, $p = .04$. However, attitudes about purchasing condoms, the effectiveness of condoms, and identity stigma associated with condom users were not significantly different between groups. On the decisional balance measure, the advantages of condom use (pros) were rated as less important by those in the alcohol group, $t(18) = 1.84$, $p = .04$. There was no significant difference in participants' ratings of the disadvantages (cons) of condom use.

The low intercorrelations of the self-efficacy items ($\alpha = .64$) supported the separate examination of these component skills. Participants who had consumed alcohol were less confident about initiating a discussion of condom use ($p = .03$). Confidence on the next two steps, insisting on condom use and refusing unprotected sex, did not differ as a function of alcohol group.

Table 1
Information–Motivation–Behavioral Skill Scores Across Conditions

Variable	Control group (n = 10)		Alcohol group (n = 10)		t (18)	p
	M	SD	M	SD		
Information						
AIDS Risk Knowledge (0–40) Questionnaire summary score	33.0	3.7	32.0	5.5	0.52	*ns*
Motivation						
Multidimensional Condom Attitudes Scale score						
Embarrassment about negotiation (1–7)	6.0	0.8	4.7	1.6	2.14	.02
Embarrassment about purchase (1–7)	5.0	1.4	4.4	1.9	0.79	*ns*
Identity stigma (1–7)	5.6	1.1	5.3	0.9	0.58	*ns*
Pleasure (1–7)	4.6	1.1	3.7	0.8	1.89	.04
Reliability/effectiveness (1–7)	6.2	0.6	6.0	1.1	0.49	*ns*
Social norms summary score (0–28)	13.3	7.1	14.9	8.0	−0.47	*ns*
Decisional balance score						
Pros (1–5)	4.0	0.7	3.3	1.0	1.84	.04
Cons (1–5)	2.1	0.9	2.2	0.6	−0.24	*ns*
Perceived risk summary score (0–7)	2.2	1.9	2.3	2.3	−0.10	*ns*
Behavioral skills						
Self-efficacy to initiate condom use discussion score (1–10)	9.2	0.9	7.6	2.2	2.10	.03
Self-efficacy to insist on condom use score (1–10)	8.1	2.4	7.2	2.1	0.89	*ns*
Self-efficacy to refuse sexual activity if unsafe score (1–10)	6.0	3.9	5.1	3.2	0.57	*ns*

Note. The numbers in parentheses are the possible ranges.

Discussion

Caveats

We first wish to acknowledge the limitations of this investigation to restrain inappropriate inference and to guide future research. First, the modest sample size restricted the power to detect differences between the two groups; continued investigation with larger samples is indicated. Second, we focused on the situational effects of a drinking event; large-scale investigations should explore person variables associated with both alcohol use and risky sexual behavior (e.g., sensation seeking; cf. Kalichman et al., 1994) to determine the separate and interactive effects of personality and alcohol use. Third, measures of behavioral self-efficacy may not be sufficiently sensitive to the effects of alcohol use. Future research with role-play simulations (see Kelly, St. Lawrence, Hood, & Brasfield, 1989a) may provide a better indication of whether alcohol use reduces behavioral skills.

The small sample size and data-analytic strategy impel additional comments. Because of the novel, exploratory nature of this research, multiple t tests were used to assess group differences, a relatively liberal approach that increased the possibility of Type I error. Nevertheless, confidence that the observed differences were not spurious is warranted because (a) the magnitude of the significant effect sizes in the study was medium (rs = .40–.45) and (b) group differences, when observed, were consistently in the predicted direction. Rosenthal (1995), among many others, has called for increased attention to effect sizes to supplement reporting of significance levels.

Findings

Two sets of findings emerged from this initial experimental study. First, participants who consumed alcohol displayed more concern about reduced pleasure as a consequence of condom use, evidenced increased embarrassment about negotiation and use, and placed less importance on the advantages of condom use. Moreover, participants who consumed alcohol reported lower levels of self-efficacy regarding the initiation of condom use discussion in sexual encounters.

This set of findings, which provides indirect support that alcohol use may increase sexual behaviors known to increase risk of HIV infection, might be explained in several ways. First, drinking alcohol may have allowed participants to express the negative attitudes that they actually hold but do not usually express because of social sanctions; this explanation is consistent with evidence that men who believe they have been given alcohol (i.e., expect but do not receive alcohol) display increased self-disclosure (i.e., Caudill, Wilson, & Abrams, 1987). In contrast, sober controls may have responded with more socially desirable attitudes. Second, a pharmacological effect may have caused the attitude shift. Consistent with an attention-allocation model (Steele & Josephs, 1988), alcohol may have constrained attention to more immediate concerns (pleasure and embarrassment), limiting concern for more distal consequences or normative standards. However, because a placebo condition was not included, the separate influences of alcohol expectancies and dose could not be tested; future research using the balanced placebo design is

warranted. Third, participants may have responded according to demand effects, perceiving the hypothesis that drinking causes unfavorable attitudes toward condoms. However, if participants' responses were biased toward demand effects, the variability in significant effects on the subscales of the Multidimensional Condom Attitudes Scale might not have been expected, and a more global pattern of change due to alcohol should have been evident.

The second set of findings involved the absence of a significant relationship between acute alcohol intoxication and AIDS-related knowledge, perceived risk for HIV/AIDS, social norms, and beliefs about the reliability and effectiveness of condoms. Alcohol use also did not reduce participants' confidence that they could insist on condom use and refuse unprotected sexual activity.

This set of findings might be construed as evidence against the alcohol–risky sex association. Alternatively, the negative findings might be attributed to the hypothesis that AIDS-related knowledge, beliefs that condoms are reliable and effective, and perceived risk may be necessary but not sufficient requisites for safer sexual decision making (cf. Fisher & Fisher, 1992). Consistent with the latter explanation are empirical tests of the IMB model in which knowledge was not directly associated with HIV risk reduction (Fisher et al., 1994).

Taken together, these two sets of findings contradict the simple interpretation that previously observed associations between alcohol use and risky sexual practices are spurious. Also, the findings do not provide overwhelming support for the notion that alcohol is a powerful determinant of sexual behavior or its antecedents. The findings do suggest that intoxication may disinhibit unfavorable condom attitudes and reduce self-efficacy for condom use, two factors identified as important antecedents of condom use in related research (e.g., Fisher et al., 1994; Wulfert & Wan, 1993). If alcohol use undermines attitudes and self-efficacy, sexual decisions may be more susceptible to maladaptive dispositional, situational, or interpersonal influences, reducing the likelihood of protective condom use.

To our knowledge, this is the first published experimental study of the effects of acute intoxication on variables derived from an HIV-relevant theoretical model. Because there was no precedent for this investigation, we elected to conduct a low-cost exploratory study with a small sample size. Our goals were to determine whether self-report measures of information, motivation, and self-efficacy—which have been used in field studies of the IMB model—would be sensitive to the effects of acute alcohol intoxication in the laboratory and to measure effect sizes that would assist in the planning of sample sizes for more expensive follow-up research. This study provides initial tests of how drinking events might be related to increased sexual risk through decreases in immediate determinants of condom use. Additional laboratory-based experimental research may provide useful data regarding the likelihood of a causal relationship between alcohol consumption and determinants of sexual choices and a more refined understanding of the mechanisms through which alcohol may be associated with less safe sexual practices.

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