Decreased Alcohol Consumption in Outpatient Drinkers Is Associated with Improved Quality of Life and Fewer Alcohol-related Consequences

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This study's objective was to determine whether changes in alcohol consumption are associated with changes in quality of life and alcohol-related consequences in an outpatient sample of drinkers. Two hundred thirteen subjects completed the Short Form 36-item (SF-36) Health Survey and the Short Inventory of Problems at baseline, 6 months, and 12 months. Subjects who sustained a 30% or greater decrease in drinks per month reported improvement in SF-36 Physical Component Summary ($P = .058$) and Mental Component Summary ($P = .037$) scores and had fewer alcohol-related consequences ($P < .001$) when compared to those with a $<30\%$ decrease. These findings suggest another benefit of alcohol screening and intervention in the primary care setting.

KEY WORDS: alcohol drinking; alcohol dependence; alcohol abuse; quality of life; health status.

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Understanding how changes in alcohol consumption affect quality of life is important because primary care providers are now asked to screen and intervene for a broad spectrum of alcohol use behaviors in their practices.^{1,2} Although brief counseling interventions can reduce alcohol consumption and health care services utilization,³⁻⁵ it is not known if such interventions result in fewer adverse consequences and improved quality of life.⁶⁻⁸ Certainly, the potential for improved quality of life and fewer consequences may motivate patients to change their behavior and encourage busy primary care providers to improve alcohol screening and intervention practices.

This report describes a preliminary study to determine whether changes in alcohol consumption are associated

with changes in health-related quality of life and alcohol-related consequences in outpatient drinkers. The post hoc analysis is based on a cohort of primary care subjects from the Early Lifestyle Modification (ELM) Study, a randomized, controlled, clinical trial of 2 types of brief intervention for alcohol use.

METHODS

The methods for the ELM study have been described in detail⁹ and are briefly summarized here. In the ELM study, subjects identified as at-risk and/or problem drinkers were randomized to 1 of 3 treatment conditions: 1) motivational enhancement; 2) brief advice; and 3) standard care. Enrolled subjects were followed for 12 months.

Study Sites and Subject Selection

Subjects were recruited between October 1995 and December 1997 from 12 primary care clinics in Pittsburgh, Pennsylvania. The study protocol was approved by the Institutional Review Boards of the University of Pittsburgh, the Department of Veterans Affairs, and of all participant sites. Potential subjects were screened in the clinic waiting areas with a survey that included the Alcohol Use Disorder Identification Test (AUDIT)¹⁰ and quantity-frequency (QF) of alcohol use. Subjects who met age and a minimal drinking threshold were invited for a baseline assessment. Subjects 21 years and older were eligible if they were current (past year) drinkers and were men who drank 16 or more standard drinks per week or women who drank 12 or more standard drinks per week or had a score of 8 or greater on the AUDIT.¹¹ Consenting subjects who met entry criteria were enrolled and randomized to 1 of the 3 treatment arms.

Data Collection

Research assistants blinded to treatment assignment conducted face-to-face interviews with study subjects at baseline, 6 months, and 12 months. Telephone assessments were done at 1, 3, and 9 months. Sociodemographic data, the Alcohol Dependence Scale, and the Psychiatric Subscale of the Addiction Severity Index were completed at baseline. The alcohol component of the Diagnostic Interview Schedule – Revised was used to determine lifetime and past-year Diagnostic and Statistical Manual of Mental Disorders – 4th Edition diagnoses of alcohol abuse or alcohol dependence.¹² The 19-item version of the Stage of

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Change Readiness and Treatment Eagerness Survey¹³ was administered at baseline. Alcohol intake was assessed at baseline and at each follow-up by the Timeline Followback (TLFB) method.¹⁴ The number of standard drinks (0.6 oz. ethanol) per month, standard drinks per drinking day, and abstinent days per months were calculated using a TLFB time frame of 30 days.

Health-related quality of life was evaluated by administering the Short Form 36-item (SF-36)¹⁵ at baseline, 6 months, and 12 months. Two SF-36 summary measures, the Physical and Mental Health Component Summary (PCS and MCS)^{16,17} scores, were calculated. Alcohol-specific adverse consequences in 5 domains (interpersonal, intra-personal, social, physical, and impulsive behavior) were evaluated by administering the Short Inventory of Problems (SIP)¹⁸ questionnaire at baseline, 6 months and 12 months. Higher SIP scores indicate increased levels of alcohol-related consequences.

Methods of Analysis

A dichotomous independent variable was created to indicate whether or not a subject sustained a 30% or greater decrease in drinks per month from baseline through the 6- and 12-month follow-ups. The cutoff of 30% was chosen to reflect the expected average decrease in alcohol consumption from a brief intervention.^{4,5} Differences in baseline variables between subjects who did and did not sustain a 30% decrease in consumption were tested using Student's *t* test for normally distributed continuous variables, the Wilcoxon test for non-normally distributed continuous variables, and χ^2 or Fisher' Exact tests for categorical variables.

The primary outcome measures were the SF-36 PCS score, the SF-36 MCS score, and the total SIP score at baseline, 6 months, and 12 months. SIP scores were log transformed for the analysis because of a skewed distribution. Repeated measures analysis of variance (ANOVA) over the 3 time points (baseline, 6 months, 12 months) was used to test for differences in the 3 dependent variables between the alcohol consumption change groups. Additional repeated measures ANOVA analyses were performed with alternative alcohol consumption decrease cutoffs of "20% or greater" and "40% or greater" to determine if PCS, MCS, and SIP score changes were sensitive to the choice of cutoff level.

To determine whether the main analysis should be adjusted for covariates, independent variables that differed significantly between alcohol consumption change groups at baseline were tested for their association with changes in quality of life and adverse consequences. Treatment group assignment (motivational enhancement, brief advice, standard care) was not used as a covariate in this analysis because the main clinical trial revealed improvement for all treatment groups, with no significant difference in drinking outcomes, SF-36 scores, or SIP scores between groups.⁹

MAIN RESULTS

Patient Eligibility

A total of 13,273 individuals were screened for study eligibility. Of these, 1,388 subjects (10.5% of total; 19.7% of current drinkers) screened positive by QF and/or AUDIT criteria. Three hundred forty-three (24.6% of positive screens) subjects consented to baseline assessment and 301 (21.7% of positive screens) subjects were randomized in the main intervention study.⁹ No significant differences in demographics, AUDIT scores, and QF were found between subjects with positive screens who did and did not assent to baseline assessment. Two hundred thirteen subjects completed the SF-36 and the SIP at each time point (baseline, 6 months, 12 months) and were included in this analysis. No significant differences in race, age, gender, and alcohol diagnosis were found between the 301 subjects in the main clinical trial and the 213 subjects used for this analysis.

Alcohol Consumption Change Groups

Seventy-seven (36%) subjects sustained a 30% or more decrease in alcohol intake from baseline through the 6- and 12-month follow-ups. Subjects able to sustain this change were significantly older, less likely to be employed, and more likely to have a diagnosis of alcohol dependence or abuse (Table 1). Subjects who sustained a 30% or greater decrease averaged 85.5 drinks per month at baseline (SD 77.3), 29.7 drinks per month (SD 40.2) at 6 months, and 22.5 drinks per month (SD 29.0) at the 12-month follow-up. On the other hand, subjects who had a less than 30% decrease in alcohol intake were steady at 66.0 (SD 61.2), 65.5 (SD 59.3), and 65.3 (SD 59.1) drinks per month at baseline, 6 months, and 12 months, respectively.

Changes in Quality of Life and Alcohol-related Consequences

Differences in health-related quality of life and alcohol-related consequences were observed during follow-up between subjects who did and did not sustain a 30% or greater decrease in drinks per month (Fig. 1). PCS and MCS rose from baseline to 12 months in subjects who sustained a decrease (Group $\times$ time interaction: $F = 2.86$, $P = .058$ for PCS; $F = 3.33$, $P = .037$ for MCS) (Figs. 1a and 1b). SIP scores decreased steadily from baseline to 12 months in subjects who sustained a 30% decrease in consumption but changed little in subjects with less than a 30% decrease (Group $\times$ time interaction: $F = 11.67$, $P < .001$) (Fig. 1c). The trends of these curves were unchanged when the analyses were repeated with the 67 alcohol-dependent and/or abuse subjects excluded. With these subjects removed, the group $\times$ time interaction effect on PCS became nonsignificant ($P = .73$) but remained significant for the MCS and SIP outcomes ($P = .002$ for both).

The SF-36 and SIP analyses were repeated using alternative cutoffs of "20% or greater" and "40% or greater"

Table 1. Characteristics of Study Subjects, by Status of Achieving a Sustained 30% Decrease in Alcohol Use from Baseline to 12 Months

Variable	Sustained 30% Decrease in Drinks per Month (N = 77)	Did not Sustain Decrease in Drinks per Month (N = 136)	P Value
Mean age (SD)	49.3 (14.3)	44.6 (15.3)	.028
Gender, n (%)			
Male	53 (69)	99 (73)	.32
Female	24 (31)	37 (27)	
Race, n (%)			.38
White	58 (75)	111 (82)	
African American	17 (22)	24 (18)	
Other	2 (3)	1 (1)	
Graduated high school, n (%)	67 (87)	126 (93)	.13
Married, n (%)	35 (45)	57 (42)	.36
Employed, n (%)	61 (79)	125 (92)	.008
30-day drinking behavior, mean (SD)*			
Standard drinks per month	85.5 (77.3)	66.0 (61.2)	.83
Drinks on a typical drinking day, n	6.2 (3.6)	5.6 (3.9)	.24
Days abstained over past month, n	15.6 (9.1)	17.3 (8.9)	.81
Taking steps to change alcohol use (n = 212), n (%)	37 (49)	73 (54)	.29
Alcohol diagnosis (n = 200), n (%)			.006
At-risk drinker†	37 (53)	96 (74)	
Alcohol abuse	13 (19)	18 (14)	
Alcohol dependence	20 (29)	16 (12)	
Alcohol Dependence Scale (n = 210), mean (SD)	6.3 (6.4)	5.9 (4.9)	.65
Addiction Severity Index, Psychiatric Subscale, (n = 193) mean (SD)	0.14 (0.20)	0.10 (0.15)	.10

* Standard drinks per month and number of drinks per typical drinking day were log transformed for the statistical analyses. The untransformed means and standard deviations are shown here.

† At-risk drinker defined as Alcohol Use Disorder Identification Test (AUDIT) score ≥ 8 and/or above threshold drinking (≥ 16 drinks per week in men, ≥ 12 drinks per week in women).

Some percentages add up to slightly more than 100% because of rounding up. The number (n) of subjects for variables with some missing data is shown in parentheses next to the variable name.

decreases in alcohol consumption. Ninety-eight (46%) of the 213 subjects sustained a 20% or greater decrease and 65 (30.5%) subjects sustained a 40% or greater decrease. Again, the trends of the PCS, MCS, and SIP change curves were similar to those in the figure. The group $\times$ time effect on the PCS outcome was not significant at the 20% decrease cutoff but remained near-significant ($P = .056$) at the 40% decrease cut-off. The group $\times$ time effect on the MCS outcome remained marginally significant ($P = .048$) at the 20% decrease cutoff but became nonsignificant at the 40% decrease cutoff. The group $\times$ time effect for the SIP outcome remained significant at both alternative cutoffs ($P = .003$ at 20% or greater decrease; $P < .0005$ at 40% or greater decrease).

No significant associations with PCS, MCS, and SIP scores were found for the variables (age, employment, alcohol diagnosis) that differed between categories of each alcohol consumption change group. Thus, the analyses were not repeated with adjustment for these variables.

DISCUSSION

Outpatient drinkers who sustain a reduction in alcohol consumption report modestly improved quality of life and fewer alcohol-related adverse consequences when compared

to drinkers who did not sustain a reduction. The findings of significantly improved mental health and fewer consequences persisted when individuals with alcohol diagnoses were eliminated from the analysis. In addition, the significance of improvements in alcohol-specific SIP scores was robust to changes in the alcohol consumption cutoff.

Although statistically significant, the clinical significance of the observed SF-36 and SIP changes is uncertain. The observed PCS increase of 3.3 points is consistent with average PCS increases seen in outcome studies for other health conditions.^{19,20} The amplitude of the observed SIP changes is difficult to interpret because the values reported here are low (lowest decile) when compared to the treatment population of alcohol dependents in whom the SIP and Drinker Inventory of Consequences were developed and validated.¹⁸ Nevertheless, the observed SIP changes seem credible because they occurred in the expected direction as alcohol consumption fell.

This study has several limitations. First, the alcohol consumption change grouping was devised in a post hoc fashion after the randomized clinical trial was completed. This limits the ability to assign causality for the observed quality of life changes. Second, this study was unable to directly answer the question of whether brief intervention results in improved quality of life and fewer alcohol

FIGURE 1. Changes in the SF-36 Physical Component Summary (PCS) score (**a**), SF-36 Mental Component Summary (MCS) score (**b**), and Short Inventory of Problems (SIP) score (**c**), stratified by whether subject sustained a 30% decrease in drinks per month. Standard deviation (SD) is shown for each mean value. The P values represent the group $\times$ time interaction term from the repeated measures ANOVA. As shown in the figure key, the total N is less than 213 because of some missing items on the SF-36 questionnaire that prevented calculation of PCS and MCS scores.

consequences. Third, the low initial participation rate of eligible patients limits generalizability. Finally, the sample size was too small to perform subgroup analysis, such as by age group or by gender.

Given these limitations, it is appropriate to view this work as preliminary. Nevertheless, the results indicate that quality of life is a potentially important outcome in primary care alcohol research and deserves further investigation. If these results are confirmed in future analyses, the potential to improve quality of life will be another compelling reason for primary care physicians to identify patients with a broad spectrum of alcohol use and to initiate appropriate intervention.

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