SELF-REPORT AND BIOMARKER ALCOHOL SCREENING BY PRIMARY CARE PHYSICIANS: THE NEED TO TRANSULATE RESEARCH INTO GUIDELINES AND PRACTICE

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(Received 20 December 2003; first review notified 6 March 2004; in revised form 2 April 2004; accepted 5 April 2004)

Abstract — Aims: To assess knowledge and use of alcohol self-report and biomarker screening by physicians. Methods: Forty-eight primary care physicians were surveyed. Results: Knowledge of MCV and GGT was as good as that for non-biomarker screening tools (CAGE, AUDIT) although use was significantly less. Knowledge and use of carbohydrate-deficient transferrin (CDT) was extremely low. Conclusions: Little translation of alcohol biomarker research into guidelines for primary care medicine has occurred. Most physicians report they would utilize these tests more frequently with additional knowledge about availability and use.

INTRODUCTION

Primary health care is a natural setting for screening alcohol-related health problems since the majority of the population seeks treatment for medical conditions on a yearly basis (Bendtsen and Akerlind, 1999). In addition, advice by general practitioners about excessive alcohol use is well received by patients (Wallace, 1985) and frequently results in substantial decreases in alcohol consumption (Fleming, 2002). Because of this, the National Institute on Alcohol Abuse and Alcoholism recommends that all adult primary care patients be screened for alcohol use (NIAAA, 2003).

In spite of these recommendations as well as the availability of valid and reliable screening tools, only 55–65% of physicians routinely ask patients about alcohol use on the initial visit and only 35% screen patients during annual visits (Bradley et al., 1995; Spandorfer et al., 1999). Physicians are most likely to know about and use quantity/frequency questions to screen (Bradley et al., 1995). A survey of a university-based department of medicine found that only 45% of the physicians had heard of the CAGE screening questions and only 14% could list all four questions (Ford et al., 1994).

Together with self-report alcohol screening tools, biochemical measures of alcohol consumption provide an accurate and reliable way to assess heavy drinking in patients. While mean corpuscular volume (MCV) is used for alcohol screening, gamma-glutamyltransferase (GGT) is the most commonly used biomarker of heavy drinking (Allen and Litten, 2001). Chronic drinking of four or more drinks per day for 4–8 weeks may significantly raise levels of this blood protein in a number of individuals. However, nonalcoholic liver disease can also increase GGT levels, increasing the likelihood of false-positive results.

Carbohydrate-deficient transferrin (CDT) is a newer biomarker that is equally or more clinically sensitive than GGT but generally more specific (Anton et al., 2002). Few medical conditions (i.e. end stage liver disease, biliary cirrhosis, and rare genetic variability) other than heavy drinking will elevate CDT levels. Of interest is the lack of a significant relationship between CDT and GGT, each being an independent marker of excessive alcohol use (Anton et al., 2002). While knowledge and use of quantity/frequency and CAGE questions have been investigated, studies of primary care screening with alcohol biomarkers have not been reported. The present investigation sought to identify knowledge and practices of a select group of primary care physicians regarding eliciting patients’ self-reports and ordering biomarker alcohol screening.

METHODS

Sample

A convenience sample of physicians whose primary care practices are members of the Practice Partner Research Network (PPRNet) served as subjects. PPRNet is a university affiliated, national network of primary care medical practices, each using a common electronic medical record (EMR) system (Ornstein et al., 2001). PPRNet provides members with quarterly practice (feedback) reports regarding adherence to established clinical guidelines, the opportunity for site visits on the use of the EMR to improve quality of care, support to attend an annual meeting, and the opportunity to participate in quality improvement research. Sixty-eight practices in 28 states have participated in PPRNet activities in the past calendar year. In general, physicians in these practices are an informed, highly motivated group determined to improve the quality of patient care through adherence with evidence-based clinical guidelines.

Our survey was conducted at the annual meeting of members in July of 2003. Twenty-two practices were represented by one or more physicians as well as mid-level providers, nurses and administrative personnel. Although all physicians in attendance were affiliated with PPRNet and, in most cases, had been exposed to training in evidence-based clinical guidelines, none had received any special training in alcohol screening guidelines. PPRNet is a general annual meeting that was not related to alcohol.

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Alcohol & Alcoholism Vol. 39, No. 4 © Medical Council on Alcohol 2004; all rights reserved
Instruments

The Clinical Practice Survey, a ten-item questionnaire about alcohol screening designed specifically for this project, was administered to physicians in attendance. The survey was completed anonymously and consisted of demographic data on age, gender, medical specialty (e.g. family practice, internal medicine, etc.), years in practice, and approximate number of patients seen per week. Questions were included regarding familiarity with and use of quantity/frequency questions, the CAGE questions, the Alcohol Use Disorders Identification Test (AUDIT), mean corpuscular volume (MCV), gamma-glutamyltransferase (GGT), and carbohydrate-deficient transferrin (CDT).

Questions about familiarity were rated on a 5-point Likert scale from ‘Very Unfamiliar’ to ‘Very Familiar’. Questions regarding frequency of use were rated on a 5-point Likert scale including the categories of ‘Never’, ‘Occasionally’, ‘Frequently’, ‘Almost Always’, and ‘Always’. Questions also included reasons for not ordering an alcohol biomarker lab test including ‘Don’t have the time’, ‘Tests are not specific enough’, ‘Concerns about false positives’, ‘Too costly’, ‘Providers do not cover costs’, ‘Unfamiliar with their use’, ‘Unfamiliar with their interpretation’, ‘Patients might object’, ‘Questionnaires are sufficient’, ‘Not my responsibility to screen’, and ‘Other’. These reasons were rated on a 5-point Likert scale from ‘Totally Unimportant’ to ‘Extremely Important’. Finally, a question about factors that would influence a decision to use biomarkers more often was asked.

Two summary scores were created for ‘familiarity with’ and ‘frequency of use’ of alcohol biomarkers, each of which was created by averaging the three questions corresponding to ‘familiarity with’ and ‘frequency of use’ of MCV, GGT and CDT. Two separate multivariate linear regression models were used to assess whether physician age, gender, years in practice, or approximate number of patients seen per week was significantly and independently associated with each of the two biomarker summary scores. All analyses were performed using SAS® (Cary, NC).

RESULTS

A total of 48 physicians completed the survey. Survey responses were anonymous with no physician name or practice group identifiers. The mean age was 46.7 (s.d. = 7.0) years, and 75% were male. The physicians had been in practice for a mean of 16.8 (s.d. = 7.5) years, and they treated an average of 89.4 (s.d. = 28.5) patients each week.

Table 1 lists the distribution of the responses to the individual questions as well as the average scores.

In response to questions about self-report screening tools, 85.2% and 71.1% of respondents scored in the two highest familiarity categories (either ‘4’ or ‘5’) with regard to quantity/frequency and CAGE questions, respectively. A total of 60.5% use quantity/frequency questions and 54.2% use CAGE questions in their practices almost always or always. Only 12.5% scored in the two highest (either ‘4’ or ‘5’) familiarity categories for the AUDIT, with only 4.2% using it ‘Almost Always’ or ‘Always’.

The mean rating for familiarity with biomarker screening tools was 3.4 (s.d. = 0.7), on a 1 to 5 scale (with 5 being ‘very familiar’), indicating that respondents were almost as familiar with alcohol biomarker screening as they were with non-biomarker screening. However, physicians were much more familiar with MCV and GGT than CDT. While ~85% marked the two highest categories of familiarity with regard to MCV and GGT, only 8.4% were that familiar with CDT.

The mean rating for use of biomarker lab tests was 2.0 (s.d. = 0.6), indicating only occasional use in practice. As with the familiarity data, there was a marked discrepancy between use of MCV and GGT compared to CDT. A total of 54.2% use MCV ‘Frequently’, ‘Almost always’ or ‘Always’, with 35% using GGT that often. Only 6.3% order CDT lab tests that often, with 93.8% never ordering CDT.

Results from a multivariate regression model suggest that familiarity with alcohol biomarkers was significantly ($P = 0.038$) greater among male physicians than females and significantly ($P = 0.022$) greater among internal medicine physicians compared with family practice physicians and specialists. Physician age, number of years in practice, and average number of patients per week were all not significantly associated with familiarity with alcohol biomarkers. A second regression model indicated that none of the physician characteristics of interest were significantly ($P > 0.05$) associated with frequency of use of alcohol biomarkers.

Reluctance to order biomarker tests was most related to unfamiliarity with their use and interpretation, a feeling that questionnaires are sufficient for alcohol screening, and a concern that providers do not cover costs for such tests (in fact, in the United States, Medicare and Medicaid pay for this test and health insurance providers will pay within the limits of the policy). Fully 95.8% would consider using CDT more often if they had more knowledge about it. Proof of the sensitivity and specificity of CDT together with evidence of a strong association between CDT and specific health risks (e.g. hypertension) would encourage almost 90% of these physicians to use this biomarker more frequently.

DISCUSSION

Approximately 60% of physicians surveyed frequently screen patients for alcohol use with quantity/frequency and CAGE questions. This is comparable to the incidence of screening found in previous studies. In addition, use of quantity/frequency and CAGE questions to screen is consistent with recommendations in the most recent National Institute of Alcohol Abuse and Alcoholism (NIAAA) screening guidelines for primary care (NIAAA, 2003).

Interestingly, only a small minority of physicians had knowledge of the AUDIT questionnaire. This is noteworthy since the AUDIT, developed by the World Health Organization (WHO) specifically for primary care settings, is a well-validated screening tool with generally better sensitivity and specificity than the CAGE (Saunders et al., 1993). However, these results are not surprising since the latest NIAAA published screening guidelines for physicians do not describe or recommend use of the AUDIT (NIAAA, 2003).

Compared to questionnaires, few physicians use alcohol biomarker screening on a regular basis. Interestingly, MCV, the alcohol biomarker test most widely used by this group, has been shown to be of limited value in general medical practice.
because of its low sensitivity and predictive value (Conigrave, 1995). CDT, especially in combination with GGT, is used little, if at all, by this group, even though it is a highly sensitive and specific instrument for use in assessing alcohol consumption in general medical practice patients (Meerkerk et al., 1998).

It is apparent but not surprising that this group of physicians was unfamiliar with alcohol biomarkers. First, NIAAA guidelines (written before availability of CDT in the United States) discourage the use of biomarkers for screening in primary care and recommend them for monitoring purposes only. Second, studies on biomarkers are typically published in specialized alcohol research journals, not usually read by clinicians. Third, CDT, the least-known biomarker in this study, was only approved by the FDA for clinical use in 2001 and its assay is not as yet widely available in the United States.

Use of biomarkers was not related to any specific characteristics of the physician or his/her practice. It would be important to survey a wider and perhaps younger selection of physicians to determine if age or years since leaving training are relevant. In fact, a limitation of the present study is the fact that we surveyed only a small, select sample of primary care physicians.

Finally, it is interesting to note that these physicians reported that they would consider more frequent use of alcohol biomarkers if they knew more about their use, interpretation, specificity, sensitivity and association with specific medical conditions. In fact, biomarkers such as CDT have shown detection sensitivity of 0.73 and specificity of 0.96 with general medical patients (Meerkerk et al., 1998). In addition, recent studies have found that elevated GGT is positively associated with hypertension (Hashimoto et al., 2001; Lee et al., 2001) and that % CDT levels are useful in detecting and/or confirming high-risk drinking in patients being treated for Type 2 diabetes and hypertension (Fleming and Mundt, 2004).

It is apparent that state-of-the-art research on alcohol screening has not been translated into national guidelines or to real-world medical practices. The need for increased technology transfer efforts in this regard is apparent.
Acknowledgements — Dr Anton is currently a consultant to Axis-Shield and has received grant funds from them in the past.

REFERENCES


