

## LETTER TO THE EDITOR

# Clinical signs of alcohol intoxication as markers of refusal to provide blood alcohol readings in emergency rooms: an exploratory study

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## INTRODUCTION

Literature on alcohol and injury – particularly traffic accidents – focuses mostly on hospital emergency rooms, since these represent a potential point of recurrent alcohol abuse or dependence, as well as a significant source for screening, brief intervention, and referral for treatment.<sup>1,2</sup> However, some studies report that social, cultural, and environmental factors influence the validity of self-reported data.<sup>3</sup> In addition, enforcement of drinking and driving laws is associated with denial of drinking among those injured in a motor vehicle accident,<sup>4</sup> and this is of particular significance in emergency rooms, where fast decisions must be taken in life-threatening situations.

When self-reports are compared with estimates of blood alcohol concentration (BAC), the longer the time between an injury and admission to an emergency room, the less likely a person is to report previous drinking, even with a positive blood alcohol concentration.<sup>4</sup> Cherpitel<sup>5</sup> states that the concordance of negative self-reports of consumption with breath-analyzer readings remains high in emergency ROOM populations regardless of when the breath-analyzer reading is obtained; however, it appears best to obtain the reading before interviewing the patient, since it increases the negative predictive value of the test. Although emergency room alcohol testing rates are similar, ranging from 70% to 90%,<sup>6,7</sup> limited research has been conducted on those who refuse to be tested, and a better understanding of those who refuse might result in a more accurate estimate of alcohol prevalence among people involved in traffic injuries.

Emergency room protocols for identifying a drunk driver or victim are also not standardized across countries, and BAC testing may not be available as a standard tool for screening in some emergency rooms, particularly in developing countries. Therefore, the identification of a drunk driver or accident victim may still rely on a thorough clinical examination to determine alcohol intoxication, which without continuous training, can lead to misleading results. Consequently, this study aimed to examine the

association between clinical signs of alcohol intoxication and refusals to participate in a traffic accident survey among emergency rooms cases in two major trauma centers of a Brazilian state capital.

## METHOD

We used a cross-sectional design with a consecutive sample in two trauma hospital emergency rooms in Porto Alegre, the southernmost state capital of Brazil (population 1.5 million). Drivers, passengers, and pedestrians over 18 admitted due to a traffic accident were recruited. The study was approved by the hospitals' institutional review boards. Levels of alcohol intoxication were obtained using calibrated Alco-Sensor IV breath analyzers (Intoximeters, Inc. 2081 Craig Road, Saint Louis, MO 63146, USA), and clinical estimates were obtained using a checklist of signs of alcohol intoxication, conducted by trained data collectors. Six hundred and ninety subjects were approached, and 158 (22.9%) refused to participate. Of the 532 (77.2%) who accepted, information on alcohol intoxication could not be obtained from 19 cases (3.8%), yielding a final sample of 513. Of the 158 refusals, 19 (12%) did not provide information on alcohol intoxication, yielding 139 refusals.

BAC readings were compared with the clinical assessment for "signs of intoxication" (ie, impaired coordination, euphoria or stupor, ataxia, labile mood, slurred speech, nausea and vomiting). This established the positive predictive value (PPV) and the probability of a post-test negative (PPTN) result for subjects who participated in the study and provided breath samples. It was assumed that the test performance would be similar for patients who accepted and those who did not. PPV and PPTN were used to estimate the prevalence of a positive BAC for refusers, and examine the potential increase in predictive value for those who agreed to participate in the survey.

## RESULTS

Table 1 shows the prevalence of positive BAC, signs of alcohol intoxication, and test performance for participants and refusers. Using the test's PPV, we estimated that 21 (70%) of the 30 refusers would have a positive BAC. Using the PPTN, we estimated that 5 (4.6%) of the 109 refusers who had no signs of intoxication would have a positive BAC. Assuming that ideally everyone had participated in the survey, 26 additional subjects with a positive BAC

**Table 1 - Alcohol assessments.**

Variable	Participants (n = 513)	Refusers (n = 139)	p Value
Signs of alcohol intoxication, n (%)	31 (6.0)	30 (21.6)	<0.001
BAC positive, n (%)	42 (8.2)	26 (18.7)*	<0.05
Test (%), mean (confidence intervals)			
Sensitivity	52.4 (37.4 to 67.1)		
Specificity	98.1 (96.5 to 99.1)		
PPV	71 (53.4 to 84.8)		
NPV	95.8 (93.8 to 97.4)		
PPTN	4.1 (2.6 to 6.3)		

\*Estimated.

BAC, blood alcohol concentration; NPV, negative predictive value; PPTN, probability of a post-test negative; PPV, positive predictive value.

would be included, which increases the overall percentage from 8.2% to 10.5% (an incremental increase of 28%).

## DISCUSSION

Our data suggest that objective screening of alcohol intoxication using established clinical indicators, even among those who refuse to provide a breath test, can increase the efficacy for estimating potential positive BACs for at-risk emergency room subjects. Although international reports of the Emergency Room Collaborative Alcohol Analysis Project<sup>8</sup> suggest a high and linear correlation between self-reported drinks and BAC measures up to the level of seven standard drinks and a BAC of 100 mg/dL,<sup>9</sup> our findings suggest that routine assessment of clinical signs for alcohol intoxication can be useful for screening in areas where the use of breath analyzers or quick blood analysis for alcohol intoxication is not routine or available, which would increase the power for brief intervention and referral to treatment in emergency rooms.

An understanding of the refusers' characteristics can be useful, since refusers behave differently in emergency rooms and may potentially affect their own clinical management in at-risk situations. Although sensitivity was low, the specificity of the test used makes it useful in settings where BAC readings cannot be collected or when patients refuse to be tested. Consequently, since the literature shows that brief intervention and referral for treatment can be effective if used for screening at emergency room admissions,<sup>2</sup> we suggest that the following routine questions

should be asked by physicians and others who believe a patient may be affected by alcohol: (a) What was the last time you drank an alcoholic beverage? (b) Have you ever had trouble with drinking in the past? (c) Can you provide valid information that you were not drinking before you took the road and drove? These are simple, straightforward questions that may narrow the gap between lack of patient information about his/her alcohol use and the potentially effective approach delivered in emergency care units.

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