Lack of Effect of Over-the-Counter Oral Care Strips on a Forensic Breath Alcohol Testing Device

JH Zager
AO Estevez

Broward County Sheriff's Office, Breath Alcohol Testing Unit, Fort Lauderdale, FL (Retired); Current address: 4401 NW 95 Avenue, Fort Lauderdale, FL 33065, USA

Abstract
There have been a considerable number of cases litigating the validity of the forensic breath alcohol test and the potentials for a false positive ethanol reading. Recently, a claim asserted that the prior use of an over-the-counter (OTC) "oral care strip" normally used to suppress halitosis of the oral cavity, produced a false positive result when a subject was given a breath alcohol test during a criminal investigation. Since the effects of oral care strips on breath alcohol testing had not been previously investigated, we undertook this study. Several brands of OTC oral care strips were tested on two separate breath alcohol analyzers: the Intoxilyzer 8000 and Intoxilyzer 5000. Test subjects consisted of two male and two female volunteers, one of which had a set of partial dentures. Results obtained from the breath testing instruments after the subjects used the oral care strips showed no false positives for ethanol. We conclude that the use of OTC oral care strips prior to testing on a forensic breath alcohol analyzer does not result in a false positive ethanol reading.

Background
The reliability of forensic breath alcohol tests to accurately determine breath alcohol content when an additional substance was introduced into the oral cavity has been tested both in and out of the court system. Investigations into the validity of false positive claims has led to the independent testing of a variety of substances introduced into the oral cavity such as blood[1], asthma inhalers[2], and oromucosal sprays[3] for their effect on readings of breath alcohol content. Over-the counter (OTC) "oral care or breath strips" are starch based films that dissolve quickly in the mouth releasing breath freshening substances such as mint and menthol, and are used by consumers to minimize strong breath odors. Recently, forensic breath alcohol test results were questioned in a criminal prosecution case for driving under the influence of alcohol (DUI) in Broward County, Florida, USA due to the prior use of an OTC "oral care strip" by the defendant.

Objectives
To determine if recent use of an "oral care strip" can falsely increase the alcohol level calculated by an evidential breath alcohol analyzer in a drinking driver.

Methodology

- Materials: Two evidential breath alcohol testing devices were used in this study: an Intoxilyzer 8000 (CMI Inc., Owensboro, KY) evidential breath analyzer, an Intoxilyzer 5000 evidential analyzer (CMI Inc., Owensboro, KY). The Intoxilyzers utilize inferred light absorption for alcohol analysis. Several brands of "oral care strips" were tested.

- Subjects: Breath alcohol readings obtained from a female subject arrested for DUI were compared to two male and two female volunteer test subjects. Test subjects were placed into one of two groups, A or B, with one female and one

male per group. The female subject in Group B had a partial set of dentures.

- Alcohol testing: The subjects in Group A were doused with ethanol and initial breath alcohol results were recorded after a 15 minute deprivation period from any fluids into the oral cavity. Group B subjects were tested for their blood alcohol content and then tested for an initial breath analysis. Both groups were then provided OTC "oral care strips". A second breath alcohol reading was obtained from Group A immediately after the "oral care strip" was placed in the subjects mouth while Group B was instructed to allow them to completely dissolve before the additional reading was obtained.

Results and analysis

A female subject was arrested for DUI and submitted to two breath alcohol tests on the Intoxilyzer 5000 evidential breath alcohol testing device and the results are shown below in Table 1. We attempted to duplicate this scenario in Group A by dousing one female and one male test subject with ethanol. The subjects abstained for 15 minutes from any fluid consumption and two baseline breath alcohol levels were recorded for both the Intoxilyzer 5000 and 8000 evidential breath analyzers (Table 1). Both subjects were then given OTC "oral care strips" and immediately after placing the strips in their mouth, provided two additional breath samples for each breath analyzer. There was no significant difference between the initial baseline readings and the ones recorded after the "oral care strips" were placed in their mouth.

Group B subjects had their blood alcohol readings confirmed to be zero prior to baseline breath testing and were tested as for Group A (results in Table 1), but were not doused with alcohol. Both subjects had baseline recordings of 0.000 g/210 as measured on both breath analyzers (Table 1). The subjects were then provided with "oral care strips" which they were instructed to let dissolve completely before providing additional breath samples. Their breath alcohol readings were again recorded at 0.000 g/210 L for all samples, unchanged from the baseline results.

Table 1: Breath Alcohol Recordings

	Sex of Subject	Evidential breath analyzer	Average of baseline recordings in g/210 L (n = 2)	Average of test recordings (n = 2) in g/210 L
DUI	Female	Intoxilyzer 5000	N/A	0.179
Group A	Female	Intoxilyzer 5000	0.070	0.066
		Intoxilyzer 8000	0.071	0.073
	Male	Intoxilyzer 5000	0.095	0.096
		Intoxilyzer 8000	0.097	0.097
Group B	Female	Intoxilyzer 5000	0.000	0.000
		Intoxilyzer 8000	0.000	0.000
	Male	Intoxilyzer 5000	0.000	0.000
		Intoxilyzer 8000	0.000	0.000

Discussion and Conclusion

The claim that prior use of an "oral care strip" would result in a false positive forensic breath alcohol recording was tested under controlled conditions. Three evidential breath alcohol devices were tested along with several brands of OTC "oral care strips". No evidence was found to support this claim. We conclude that the use of OTC "oral care strips" prior to testing on a forensic breath alcohol analyzer does not result in a false positive ethanol reading.

References

1. Zager and Estevez. (2002). Lack of Effect on Evidential Breath Alcohol Analysis with Blood in the Oral Cavity. Proceedings of the 16th Annual International Conference on Alcohol, Drugs and Traffic Safety. Montreal, Canada. pp. 1153-1154.
2. Garcia et al. (2002). Influence of asthma inhalers on a breath alcohol test. Med Clin (Barc), 118(9):332-334.
3. Zeleny et al. (2000). Effect of Stopangin mouth spray on blood alcohol levels measured by the Alcotest 7410 analyser made by Drager. Soud Lek, 45(4):54-56.