

The Effect of an Instant Hand Sanitizer on Blood Glucose Monitoring Results

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Abstract

Background:

People with diabetes mellitus are instructed to clean their skin prior to self-monitoring of blood glucose to remove any dirt or food residue that might affect the reading. Alcohol-based hand sanitizers have become popular when soap and water are not available. The aim of this study was to determine whether a hand sanitizer is compatible with glucose meter testing and effective for the removal of exogenous glucose.

Methods:

We enrolled 34 nonfasting subjects [14 male/20 female, mean ages 45 (standard deviation, 9.4)] years, 2 with diagnosed diabetes/32 without known diabetes]. Laboratory personnel prepared four separate fingers on one hand of each subject by (1) cleaning the second finger with soap and water and towel drying (i.e., control finger), (2) cleaning the third finger with an alcohol-based hand sanitizer, (3) coating the fourth finger with cola and allowing it to air dry, and (4) coating the fifth finger with cola and then cleaning it with the instant hand sanitizer after the cola had dried. Finger sticks were performed on each prepared finger and blood glucose was measured. Several *in vitro* studies were also performed to investigate the effectiveness of the hand sanitizer for removal of exogenous glucose.^z

Results:

Mean blood glucose values from fingers cleaned with instant hand sanitizer did not differ significantly from the control finger ($p = .07$ and $.08$, respectively) and resulted in 100% accurate results. Blood glucose data from the fourth (cola-coated) finger were substantially higher on average compared with the other finger conditions, but glucose data from the fifth finger (cola-coated then cleaned with hand sanitizer) was similar to the control finger. The data from *in vitro* experiments showed that the hand sanitizer did not adversely affect glucose meter results, but when an exogenous glucose interference was present, the effectiveness of the hand sanitizer on glucose bias (range: 6% to 212%) depended on the surface area and degree of dilution.

Conclusions:

In our study, use of an instant hand sanitizer was compatible with the results of a blood glucose monitor and did not affect finger stick blood glucose results. However, depending on surface area, hand sanitizers may not be adequate for cleaning the skin prior to glucose meter testing.

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Abbreviations: (CV) coefficient of variation, (SD) standard deviation, (SMBG) self-monitoring of blood glucose, (YSI) Yellow Springs Instrument

Keywords: blood glucose monitoring, hand sanitizer, pre-analytical error, self-monitoring of blood glucose

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