K39 Investigation of the Effect of Vinegar on Oral Fluid Drug Testing: Effects on Immunoassay Screening

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After attending this presentation, attendees will learn about: (1) the effects of different types of vinegars on the Orasure Intercept®, and microplate screen; and (2) the new Concateno Certus™ oral fluid collection devices with homogenous immunoassay screen.

This presentation will impact the forensic science community deomonstrating how the Orasure Intercept® oral fluid collection device exhibited many oral fluid false positive after the consumption of various types of vinegar.

Introduction: Oral fluid (OF) drug testing has become increasingly popular during recent years as an alternative matrix for drugs of abuse (DOA) testing. OF is simple and easy to collect and offers a non-invasive means of sample collection that can be applied for use in the work place, hospitals, drug treatment centers, and roadside. Although numerous studies have been published in relation to OF drug detection and identification, little work has been undertaken to investigate the effects of substances. In a separate study, several different foods and beverages and the result from this indicative study inferred the possibility that vinegar could cause an effect on an immunoassay screen were evaluated. This study was conducted to look at this effect in greater detail. This study investigates the effects of different types of vinegars on the Orasure Intercept® and microplate screen and the new Concateno Certus™ OF collection devices with homogenous immunoassay screen.

Method: Non-drug using human volunteers were asked to swirl 5mL of selected vinegars around the mouth. These included malt, white distilled, balsamic, red wine, and white wine vinegar. After consumption, OF was collected using the Orasure Intercept® or the new Concateno Certus™ OF collection devices a) immediately after mouth emptying and b) 10, 20 and 30 minutes after mouth emptying. Each volunteer provided samples using both devices for all vinegars tested. The volume, pH and time for collection of samples were recorded. OF samples were subsequently analyzed using two different immunoassays for Amphetamine, Methamphetamine, Cocaine, Methadone and Opiates. Intercept® samples were analyzed using Orasure microplates and Certus™ samples were analyzed using the Concateno homogeneous assays to observe whether the substances affected the immunoassay screening systems.

Results: The Intercept® device collected an average of 0.55 mL in the 3 minutes recommended by the manufacturer. The Certus™ device has a built-in indicator and we collected an average of 1.15 mL in an average time of 1.67 minutes. The OF pH was not affected for either collection device. Presumptive positive Intercept®/Orasure samples were observed for amphetamine, methamphetamine and cocaine following consumption of all types of vinegar. Most presumptive positives were seen at the early time points although a significant number we also observed out to 30 minutes. The screen positives were submitted for GC/MS confirmation and found to be confirmation negative – screen false positives. There was also a depression of the binding for Intercept®/Orasure samples for opiate and methadone assays although this was not enough to trigger a positive response against the kit cut off. By comparison the Certus™ /Concateno samples were negative for all vinegar types and time points.

Conclusion: The Orasure Intercept® OF collection device exhibited many OF false positive after the consumption of various types of vinegar. There was no significant difference between collection times, pH, or volume collected. False positive samples out to 30 minutes were a surprising observation. The Concateno Certus™ OF collection device was shown to collect larger volumes of fluid, more consistently, in a shorter time frame. All of the Certus™ screens were negative.

Oral fluid drug testing is increasing in popularity in forensic, clinical, and workplace scenarios. In order to avoid potential miscarriages of justice or misinterpretation of results, it is essential that any tests employed for human oral fluid drug screening should provide results that are accurate. Personnel using oral fluid drug testing devices should be aware of possible interactions that could provide false positive results. This presentation highlights the potential for false positive screening results that may be observed following the collection of oral fluid after the use of certain food types.

Oral Fluid, Concateno, Orasure

 ** Presenting Author*