

LungAlert™

Results of a pilot study of a screening test based on galactose oxidase Schiff's reactivity in the detection of lung cancer.

Introduction: The galactose oxidase Schiff's reaction (GOS) detects D-galactose-beta [1-3]-N-acetyl-D-galactosamine also known as T-antigen. GOS-reactive material has been found in many cancers including lung cancer. One of the difficulties associated with the GOS method is that the interpretation of the test result is subjective and is based on visual evaluation of colour development. We evaluated a new test, based on the GOS method, that produces an objective interpretation of the test result using a spectrophotometer. **Methods:** Sputum samples were collected from 76 individuals: 24 healthy volunteers, 27 patients with benign lung disease, and 25 with lung cancer. 100% of the cancer patients and 63% of the benign disease patients produced sputum spontaneously whereas 92% of the healthy volunteers had sputum production induced. 50ul of untreated sputum was applied to a glass fiber membrane attached to a slide-shaped holder and air-dried. Samples were treated with galactose oxidase, stained with Schiff's reagent, and scanned. Results were obtained by determining the hue of the scanned sample using a portable spectrophotometer. All GOS testing was done blinded to clinical diagnosis. **Results:** Sputum from patients with cancer had significantly lower hue values than those with benign disease ($p < 0.001$) or healthy volunteers ($p < 0.025$). Individuals with benign disease more closely matched the cancer patients than healthy volunteers in terms of age, gender, race, and ability to produce spontaneous sputum and provide an appropriate control population to evaluate test sensitivity and specificity. Using a hue cutoff of < 18.9 we detected 88% of the lung cancer cases with a specificity of 77.8% relative to benign disease. Relative to healthy volunteers the specificity was 57.7%. **Conclusions:** These data from our preliminary study suggest that this novel method could have utility as a screening tool for lung cancer.

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