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Comparison of Indirect Methods for Lactose Malabsorption

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Abstract: Although direct determination of the lactase activity of the small intestinal mucosa is considered a "gold standard" for the diagnosis of hypolactasia leading to lactose malabsorption, less invasive and simpler indirect techniques like the "plasma glucose response test" and "breath hydrogen test" are preferred in daily practice to diagnose the disorder. The aim of this study was to compare the different indirect diagnostic methods for lactose malabsorption. The following tests were performed in 54 adults: plasma glucose response test, breath hydrogen test and urine galactose/creatinine ratio. The diagnostic variables were as follows: increased plasma glucose ≥ 20 mg/dl; increased exhalation of breath hydrogen ≥ 20 ppm, and urinary galactose/creatinine ≥ 0.1 mg/mg 60 min after 50 g oral lactose loading. Using the gold standard of two diagnostic variables (plasma glucose response test and breath hydrogen test) being positive, lactose malabsorption rate was found to be 85%. Positive predictive values of the plasma glucose response test and breath hydrogen test were 93.8% and 95.8%, respectively. The discordance rate of the tests was 9.2%. We modified a qualitative galactose spot test to determine urinary galactose quantitatively, and used the galactose/creatinine ratio for the indirect detection of lactose malabsorption. The sensitivity, positive predictivity and negative predictivity of the urinary galactose/creatinine ratio at 60 min were determined to be 93.4%, 93.4% and 37.5%, respectively. In conclusion, we suggest the use of the positivity of any two (instead of the former use of only one) of these three indirect methods in accordance with the suitability of the technical equipment of a laboratory, as a "gold standard" for diagnosing lactose malabsorption. Being noninvasive, safe and accurate, we propose the use of a combination of urinary galactose/creatinine ratio and breath hydrogen test, where available, as a convenient protocol for the diagnosis of lactose malabsorption.

Key Words: Lactose malabsorption, urinary galactose, breath hydrogen test, lactose tolerance test

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