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Stool-based DNA testing, a new noninvasive method for colorectal cancer screening, the first report from Iran

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Abstract

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Aim: To detect tumor-associated DNA changes in stool samples among Iranian patients with colorectal cancer (CRC) compared to healthy individuals using BAT-26, p16 hypermethylation and long DNA markers. **Methods:** Stool DNA was isolated from 45 subjects including 25 CRC patients and 20 healthy individuals using a new, fast and easy extraction method. Long DNA associated with tumor was detected using polymerase chain reaction method. Microsatellite studies were performed utilizing denaturing polyacrylamide gel to determine the instability of BAT-26. Methylation status of p16 promoter was analyzed using methylation-specific PCR (MSP). **Results:** The results showed a significant difference in existence of long DNA (16 in patients vs 1 in controls, $P < 0.001$) and p16 (5 in patients vs none in controls, $P = 0.043$) in the stool samples of two groups. Long DNA was detected in 64% of CRC patients; whereas just one of the healthy individuals was positive for Long DNA. p16 methylation was found in 20% of patients and in none of healthy individuals. Instability of BAT-26 was not detected in any of stool samples. **Conclusion:** We could detect colorectal cancer related genetic alterations by analyzing stool DNA with a sensitivity of 64% and 20% and a specificity of 95% and 100% for Long DNA and p16 respectively. A non-invasive molecular stool-based DNA testing can provide a screening strategy in high-risk individuals. However, additional testing on more samples is necessary from Iranian subjects to determine the exact specificity and sensitivity of these markers. © 2007 The WJG Press. All rights reserved.

Reaxys Database Information

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Author keywords

BAT-26; Cancer screening; Colorectal cancer; Long DNA; p16; Stool DNA

Indexed Keywords

EMTREE drug terms: DNA; polyacrylamide gel; protein p16

EMTREE medical terms: adult; aged; article; cancer screening; clinical article; colorectal cancer; controlled study; DNA determination; DNA extraction; DNA isolation; DNA methylation; feces analysis; female; human; Iran; male; microsatellite marker; non invasive measurement; polymerase chain reaction

MeSH: Adult; Aged; Aged, 80 and over; Colorectal Neoplasms; DNA Methylation; DNA, Neoplasm; Feces; Female; Gene Expression Regulation, Neoplastic; Genes, p16; Genetic Screening; Humans; Iran; Male; Middle Aged; Mutation; Sensitivity and Specificity; Tumor Markers, Biological

Medline is the source for the MeSH terms of this document.

Chemicals and CAS Registry Numbers: DNA, 9007-49-2; BAT26 protein, human; DNA, Neoplasm; Tumor Markers, Biological

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