Bowel cancer screening

Risk of colon cancer

The risk of colon cancer in the population in the Czech Republic is constantly increasing. The incidence reached 80 per 100 000 inhabitants in 2007 and is the highest in European comparison. Screening programs include methods of detection of occult bleeding – FOBT, detection of genetic markers and imaging colonoscopic, reps. sigmodoscopic examination.

Development of molecular biology and applications of type PCR in routine diagnosis, they also open up completely new trends in GIT tumour screening. The latest screening methods are based on the detection of specific mutations by PCR or biochip technology in DNA isolated from a stool sample. For the detection of tumors colon mutations of APC, K-ras, p53, microsatellitic instability (MSI) genes and other genetic markers can be determined from a stool sample.

Occult haemorrhage screening

Screening of occult haemorrhage for the detection and early diagnosis of colorectal tumours by the Haemoccult test is carried out in detail, the interval screening, age range and subsequent colloscopic examination programme with positive evidence of occult haemorrhage are established.

Hemoglobin concentration in faeces *is an crucial question of setting a 'cut-off* value for screening. The physiological process defines daily blood losses of faust in the volume of 0.5-2.5 ml. If we recalculate this amount of blood by the concentration of haemoglobin in the blood (120-150 mg/ml) and the amount of stool in 24 hours (300-450 g), then we can consider the values of 0.3-1.3&mg hemoglobin per 1 g of stool as a physiological range. A healthy/physiological population with a concentration of 0.3-1.3 mg Hb/g stools and an Hb concentration curve in colorectal cancer can be viewed schematically. The detection cut-off for the standard Haemoccult test (gFOBT) is approximately 5 mg Hb/g stool, so it does not catch all KRCA, but should not detect any healthy individual positively. The level of the detection limit is discussed, e.g. for imunochemical tests - iFOBT.

Studies in recent years have tested several immunochemical analyzers for quantitative determination of haemoglobin in faeces (qi-FOBT), most of which are Japanese-made. ROC curves demonstrate a specificity for advanced adenomas 95,3 % at a sensitivity of 100 ng Hb/ml.

DNA test

Newly introduced molecular-genetic diagnostic methods have a higher sensitivity than the demonstration of haemoglobin in faeces. In the stool sample, the aberrantly methylated DNA of promoter regions *BMP3* and *NDRG4* and mutations in the *KRAS* gene are shown. The sensitivity of the method for carcinoma is 92%, for advanced adenoma as a significant precancerosis 42%[1].

Links

Source

- with author's permission taken from KOCNA, Petr. *GastroLab : MiniEncyklopedie laboratorních metod v gastroenterologii* [online]. ©2002. Poslední revize 2011-01-08, [cit. 2011-03-04]. <http://www1.lf1.cuni.cz/~kocna/glab/glency1.htm>.

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