



Review Article

CRC SCREENING: CURRENT TREND AND FEASIBILITY.

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Abstract:

Colorectal cancer, a rising health concern of both east and west, can be prevented and its mortality can be reduced by screening all men and women of average risk at the age of 50 years or older and at an earlier age for high risk group of colorectal cancer. Several tests are available for colon cancer screening, including fecal occult blood test (FOBT), flexible sigmoidoscopy, double-contrast barium enema, and colonoscopy. Direct and indirect evidence indicates that all the tests are effective, but they differ in their sensitivity, specificity, cost, and safety. The available evidence does not currently support choosing one test over another. In addition, other new colorectal cancer tests, such as virtual colonoscopy or stool-based molecular testing, have the potential to become important screening tests in the future.

Key Words : Colorectal cancer screening, fecal occult blood test, flexible sigmoidoscopy, double-contrast barium enema, colonoscopy, virtual colonoscopy

Introduction:

Screening is the process of looking for or checking for health problems in population before they cause symptoms in order to improve outcomes by early detection^{1,2,3}

Colorectal cancer (CRC) is one of the most common cancers in the world. It is the third most common cancer in United Kingdom as well as in the United States of America. Colorectal cancer has become an important problem in Asian countries also. Reports from the World Health Organization (WHO) data set

and from individual countries or cities in Asia show that the incidence of CRC is rising rapidly. It accounts for an estimated 1.2 million new cancer cases and over 630 000 cancer deaths per year, almost 8% of all cancer deaths.

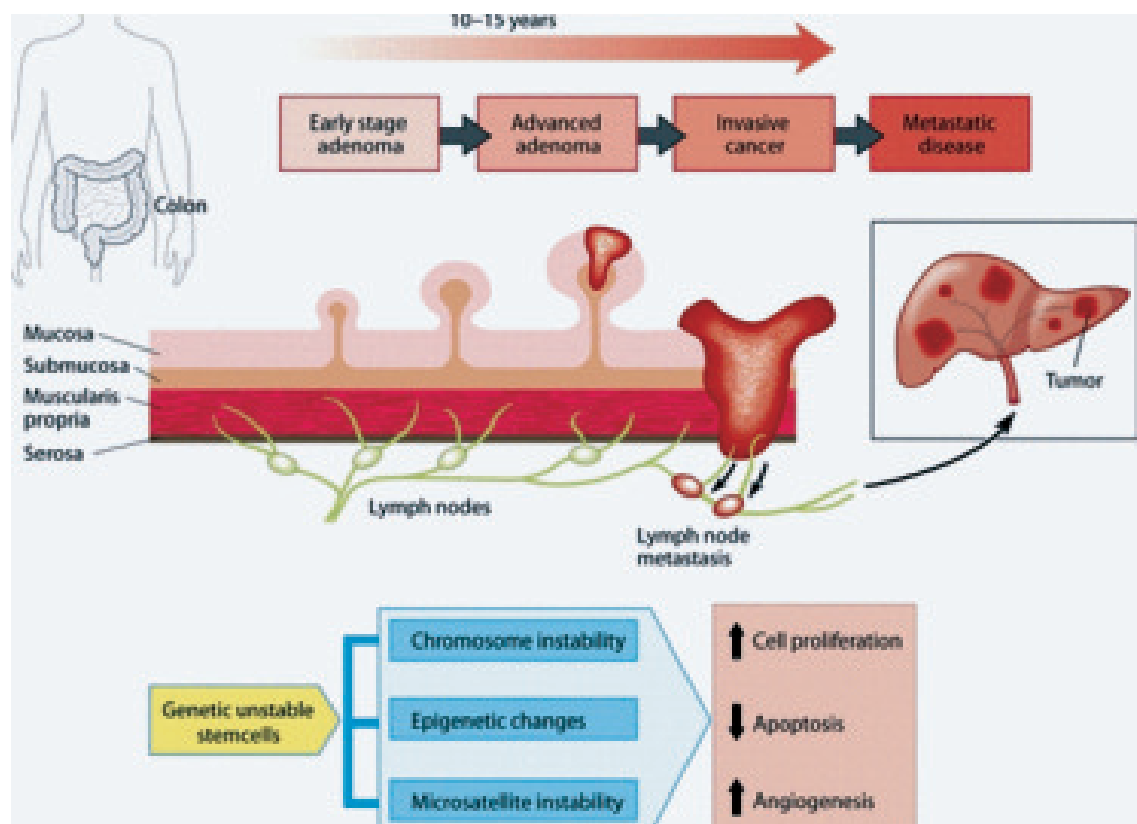
Most colorectal cancers develop from precancerous polyps. Polyps are growths that arise in the lining of the colon and are visible when the bowel is examined by endoscopy (colonoscopy or sigmoidoscopy). There are two main types of polyps: adenomatous and hyperplastic. Adenomatous polyps can become cancerous over time; this progression takes at least 10 years in most people

From the time the first abnormal cells start to grow into precancerous polyps, it usually takes about 10 to 15 years for them to develop into colorectal cancer. Regular screening can, in many cases, prevent colorectal cancer altogether. This is because some precancerous polyps, or growths, can be found and removed before they have the chance to turn into cancer. Screening can also result in finding colorectal cancer early, when it is highly curable¹. So screening can save lives by prevention and providing curative treatment of colorectal cancer⁴⁻⁶.

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The National Polyp Study (USA) showed in its surveillance program that individuals who had their polyps removed experienced a 90% reduction in the incidence of colorectal cancer. The few patients in the study who did develop colorectal cancer had their cancer discovered at early, surgically or endoscopically curable stages⁷.

Adenoma–carcinoma sequence⁸.

Since most colon polyps and early cancers are silent (produce no symptoms), it is important to do screening and surveillance for colon cancer in patients without symptoms or signs of the polyps or cancers. Recommendations for cost-effective public screening and surveillance have been promulgated and endorsed by numerous societies including the American Cancer Society, the National Cancer Institute, American College of Gastroenterology, American Medical Association, American College of Physicians, etc⁷.

In Asia, screening with faecal occult blood test is a national policy only in Japan, Taiwan and Korea⁶. In Bangladesh, currently the awareness of the importance of CRC screening is very low especially among the general population as well as the policy makers which resulted in inadequate resources allocation for faecal occult blood test and colonoscopy as a consequence patients are presenting with CRC in advanced stage.

Risk category for developing colorectal cancer^{1,2}

- **Average Risk people**

1. Asymptomatic
2. 50 years

- **Increased or high risk People**

The following conditions make the risk higher than average^{1,2}

1. A personal history of colorectal cancer or adenomatous polyps
2. A personal history of inflammatory bowel disease (ulcerative colitis or Crohn's disease)
3. A strong family history of colorectal cancer or polyps(non syndromic)
4. A known family history of a hereditary colorectal cancer syndrome such as familial adenomatous polyposis (FAP) or hereditary non-polyposis colon cancer (HNPCC)^{1,2,3}

Methods used to screen people for colorectal cancer.

- Fecal occult blood test (FOBT)

This test checks for hidden blood in fecal material (stool). Currently, two types of FOBT are available. One type, called guaiac FOBT, uses the chemical guaiac to detect heme in samples of stool. Heme is the iron-containing component of haemoglobin.



Fecal Occult Blood Test (FOBT) kit to check for blood in stool².

Usually, samples of stool from three different bowel movements are collected for guaiac FOBT. The other type of FOBT, called immunochemical (or immunohistochemical) FOBT, uses antibodies to detect human hemoglobin protein in samples of stool. Depending on the type of immunochemical FOBT, stool samples from one to three bowel movements are collected. Studies have shown that FOBT, when performed every 1 to 2 years in people ages 50 to 80, can help reduce the number of deaths due to colorectal cancer by 15 to 33 percent².

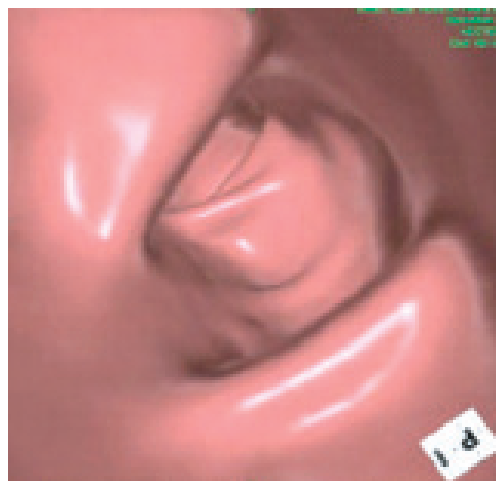
• **Sigmoidoscopy**

In this test, the rectum and lower colon are examined using a lighted instrument called a sigmoidoscope. During sigmoidoscopy, precancerous and cancerous growths in the rectum and lower colon can be found and either removed or biopsied. Studies suggest that regular screening with sigmoidoscopy after age 50 can help reduce the number of deaths from colorectal cancer^{2,9}.

• **Colonoscopy**

In this test, the rectum and entire colon are examined using a lighted instrument called a colonoscope. During colonoscopy, precancerous and cancerous growths throughout the colon can be found and either removed or biopsied, including growths in the upper part of the colon, where they would be missed by sigmoidoscopy. A thorough cleansing of the colon is

necessary before this test, and most patients receive some form of sedation²



• **Virtual colonoscopy (CT colonography)**

In this test, special x-ray equipment is used to produce pictures of the colon and rectum. A computer then assembles these pictures into detailed images that can show polyps and other abnormalities. Because it is less invasive than standard colonoscopy and sedation is not needed, virtual colonoscopy may cause less discomfort and take less time to perform. As with standard colonoscopy, a thorough cleansing of the colon is necessary before this test.

Virtual endoluminal view is reconstructed by computer processing to simulate a conventional endoluminal view of the colon¹⁰.

• **Double contrast barium enema (DCBE)**

In this test, a series of x-rays of the entire colon and rectum are taken after the patient is given an enema with a barium solution and air is introduced into the colon. The barium and air help to outline the colon and rectum on the x-rays. Research shows that DCBE may miss small polyps. It detects about 30 to 50 percent of the cancers that can be found with standard colonoscopy².

Screening options for patients with an average risk for colon cancer¹

There is not enough evidence to state which screening method is best. Beginning at age 50, both men and women should have a screening test.

- a) Fecal occult blood test (FOBT) every year - if results are positive,
- b) Immunochemical FOBT
- c) Colonoscopy every 10 years
- d) Virtual colonoscopy every 5 years

Screening For Higher-Risk People¹

Increased Risk – Patients With a Family History

Risk Category	Age to Begin	Recommended Test(s)	Comment
Colorectal cancer or adenomatous polyps in any first-degree relative before age 60, or in 2 or more first-degree relatives at any age (if not a hereditary syndrome).	Age 40, or 10 years before the youngest case in the immediate family, whichever is earlier	Colonoscopy	Every 5 years.
Colorectal cancer or adenomatous polyps in any first-degree relative aged 60 or older, or in at least 2 second-degree relatives at any age	Age 40	Colonoscopy	Every 5 years.

High Risk

Risk Category	Age to Begin	Recommended Test(s)	Comment
Familial adenomatous polyposis (FAP) diagnosed by genetic testing, or suspected FAP without genetic testing	Age 10 to 12	Yearly flexible sigmoidoscopy to look for signs of FAP; counseling to consider genetic testing if it hasn't been done	If genetic test is positive, removal of colon (colectomy) should be considered.
Hereditary non-polyposis colon cancer (HNPCC), or at increased risk of HNPCC based on family history without genetic testing	Age 20 to 25 years, or 10 years before the youngest case in the immediate family	Colonoscopy every 1 to 2 years; counseling to consider genetic testing if it hasn't been done	Genetic testing should be offered to first-degree relatives of people found to have HNPCC mutations by genetic tests. It should also be offered if 1 of the first 3 of the modified Bethesda criteria is met.
Inflammatory bowel disease: Chronic ulcerative colitis Crohn's disease	Cancer risk begins to be significant 8 years after the onset of pancolitis (involvement of entire large intestine), or 12-15 years after the onset of left-sided colitis	Colonoscopy every 1 to 2 years with biopsies for dysplasia	These people are best referred to a center with experience in the surveillance and management of inflammatory bowel disease.

Pros and cons of these screening tests.

Test	Pros	Cons
Flexible sigmoidoscopy	Fairly quick and safe Usually doesn't require full bowel preparation Sedation usually not used Does not require a specialist Done every 5 years	Views only about a third of the colon. Can miss small polyps. Can't remove all polyps. May be some discomfort. Very small risk of bleeding, infection, or bowel tear. Colonoscopy will be needed if abnormal
Colonoscopy	Can usually view entire colon Can biopsy and remove polyps Done every 10 years. Can diagnose other diseases	Can miss small polyps. Full bowel preparation needed. More expensive on a one-time basis than other forms of testing. Sedation of some kind is usually needed. Small risk of bleeding, bowel tears, or infection
CT colonography (virtual colonoscopy)	Fairly quick and safe Can usually view entire colon Done every 5 years No sedation needed	Can miss small polyps. Full bowel preparation needed Some false positive test results. Cannot remove polyps during testing. Colonoscopy will be needed if abnormal. Still fairly new - may be insurance issues
Fecal occult blood test (FOBT)	No direct risk to the colon No bowel preparation Sampling done at home Inexpensive	May miss many polyps and some cancers. May produce false-positive test results. May have pre-test dietary limitations. Should be done every year. Colonoscopy will be needed if abnormal
Fecal immunochemical test (FIT)	No direct risk to the colon No bowel preparation No pre-test dietary restrictions Sampling done at home Fairly inexpensive	May miss many polyps and some cancers. May produce false-positive test results. Should be done every year. Colonoscopy will be needed if abnormal

What happens if a colorectal cancer screening test shows an abnormality

If an abnormality is seen in FOBT, patient is advised for colonoscopy. If an abnormality is seen in colonoscopy biopsy is taken or if lesion is polyp then polypectomy is done. Further management depends on histopathology report.

New tests on the horizon.

Genetic testing of stool samples is being studied as a possible way to screen for colorectal cancer. The lining of the colon is constantly shedding cells into the stool. Testing stool samples for genetic alterations that occur in colorectal cancer cells may help doctors find evidence of cancer or precancerous growths. Research conducted thus far has shown that this kind of test can detect colorectal cancer in people already diagnosed with this disease by other means. However,

more studies are needed to determine whether this type of test can accurately detect colorectal cancer or precancerous polyps in people who do not have symptoms².

Conclusion:

Colorectal cancer screening reduces death from colorectal cancer and can decrease the incidence of disease through removal of adenomatous polyps. Several available screening options seem to be effective, but the single best screening approach cannot be determined because data are insufficient. In our context to reduce the load of CRC as well as the health budget people should be brought in the screening programme. Considering the socioeconomic condition we should adopt a secondary programme which costs minimally. Our

recommendation is to spread awareness in the different forum regarding CRC and at least FOBT can be introduced as an interval step.

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