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COLONOSCOPY IN SCREENING FOR COLORECTAL CANCER

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HEADINGS – Colonoscopy. Colorectal neoplasms.

The annual burden of colorectal cancer in the World was estimated in the Globocan database for year 2008[3] at 1,235,108 new cases and 609,51 deaths. The annual number of incident cases of colorectal cancer is just behind that of lung and breast cancer. The estimates for Brazil, according to data of INCA (2012), are 30.140 for new cases and 13,344 deaths (2010), with an incidence of 15/100,000 per year. In Brazil, the colorectal cancer corresponds to the third most frequent incidence for both male and female population, being the second most frequent on the southeast region (22/100,000 per year). In complement to primary prevention by control of causal factors, this high figure justifies, a policy of secondary prevention by screening for early detection and treatment of cancer and also of its malignant precursors. The causal factors of colorectal cancer belong to two categories: 1 - a diet rich in calories with an excess of meat; 2 - a decreased physical activity. These two factors are linked to country development; therefore the incidence of colorectal cancer is higher in the more developed than in the less developed countries. Actually the incidence is higher in North America, Japan, Europe, Australia and New Zealand[2]. In the so-called emerging countries which show a very rapid development a sharp increase in the incidence of colorectal cancer occurred during the more recent decades; Brasil belongs to these emerging countries.

The risk of colorectal cancer is very low in persons aged less than 40 years and increases with aging; however cases of hereditary colorectal cancer occur at a young age. The incidence of colorectal cancer is slightly higher in men than in women and both sexes show a significant risk if aged over 60 years. Colorectal cancer develops through the adenomatous polyp-cancer sequence. Malignant colorectal lesions are completely curable by resection, when their depth is limited to mucosa (m) or submucosa (sm). Superficial curable cancer is the target of screening, as well as the premalignant adenomatous precursors, often called polyps. In the adult population of developed countries the adenomatous precursors show a prevalence, in the range of 30%. The flat or non-polypoid precursors, are benign or already malignant. These lesions were first described in Japan and their morphology was classified in the Paris Endoscopic Classification[7] as elevated (0-IIa), completely flat (0-IIb) or depressed. These non-polypoid lesions lesions have been extensively analyzed[4] and are easily missed during endoscopy. Flat precursors are often responsible of the so-called "interval cancer" occurring after a false negative screening intervention.

The modalities of screening for the secondary prevention of colorectal cancer include the detection of occult blood in the stools[6] called fecal occult blood test (FOBT) and endoscopy through flexible sigmoidoscopy or colonoscopy[5, 8]. Mass screening, under the control of National Health Authorities, addresses to the adult population in the age range 50 to 70 years. These organized protocols are based on a simple filter test like the FOBT followed by a colonoscopy in persons with a positive test. The efficacy of the FOBT in detection of colorectal cancer has been confirmed in Randomized trials. However, at the scale of the population submitted to the intervention, there is no impact on the incidence of cancer and the reduction of the specific mortality in the population is in the range of 15%. Non organized or opportunistic screening, concern individual asymptomatic persons who accept a colonoscopy as the first test. At this individual scale the screening intervention ensures a reduction of the incidence (and mortality) of colorectal cancer in the range 80% for these persons. Actually the reduction of the risk of cancer by colonoscopy is linked to the endoscopic resection of the premalignant adenomatous precursors.

A colonoscopy is of course proposed to persons complaining from intestinal symptoms such as abdominal pain, disturbed intestinal transit, bleeding; this is not screening. A screening colonoscopy can be proposed to asymptomatic persons in the age range 50 to 70 years, in two distinct conditions: 1 - after a positive FOBT in a strategy of Mass screening; 2 - as a primary procedure in opportunistic screening. There has been recently a considerable progress in the material. The modern electronic video-colonoscopes offer

a high resolution image, completed by magnification with a zoom, techniques of image processing like the Narrow Band Imaging, auto-fluorescence. A screening colonoscopy is performed more often in out-patients than during an hospitalization, however the procedure is not so simple. At first the intestinal preparation requires a complete cleaning of the colonic lumen by drinking in a short time a large amount of liquid. Then sedation requires the assistance of a specialized nurse or an anesthesiologist. During colonoscopy the progression of the flexible endoscope from the rectum to the cecum in the proximal colon requires repeated pressions on the abdominal wall for the reduction of loops.

The objective of colonoscopy is the detection of neoplastic lesions. Protruding pediculated or sessile polyps are easily seen but non-polypoid flat lesions which are more frequent in the proximal colon can be missed. The Japanese school of digestive endoscopy developed a two steps strategy for detection: 1 - detection of an area of suspicion through a sharp variation in the color of the mucosa or in the direction of sub-epithelial capillaries; 2 - characterization of the suspect area after spraying of a dye to fix the limits with the help of image processing to predict the histology and select the treatment option, between no treatment, endoscopic resection, surgery. Characterization of histology as non-neoplastic, low-grade dysplasia, high-grade dysplasia, cancer is based on the analysis of the so-called pit pattern of surface epithelial crests and depressions. The pit pattern has been extensively described by Kudo[4] with Groups I and II for non-neoplastic lesions, Groups III and VI for intraepithelial neoplasia, Group V for cancer. As a consequence when adenomatous polyps are detected they may require an endoscopic treatment, followed by a collection of the resected specimen; this step is a potential source of complications like bleeding or perforation. Resection is often performed by endoscopic mucosal resection (EMR) with a ligating snare in a single fragment (en bloc) or in multiple fragments (piece-meal). A more recent technique adapted to resection of large lesions is the endoscopic submucosal dissection (ESD) which allows a complete analysis of the submucosa under the lesion.

There are multiple sources of complication around a colonoscopy, linked to the step of colonic lavage requiring a massive rehydratation with a risk of renal failure, to the sedation and use of anesthesiology drugs, to bacteremia and infection. Intestinal perforation and intestinal hemorrhage are linked to the procedure itself. Overall, the frequency of complications is low, not over 1%, in large series, however a higher risk occurs in aged persons in the age range 70 to 80 years and when there are factors of comorbidity. These factors have been classified and graded with a score 1 to 6 in the Charlston list[1] and they include cardiovascular diseases, cerebrovascular diseases, pulmonary, renal and liver diseases. Globally colonoscopy is a complex, but safe procedure, when the factors of comorbidity have been assessed and when the persons are in the age range 40 to 70 years. This means that the strategy of screening for colorectal cancer, either with the FOBT filter test, either with primary colonoscopy, should be proposed to persons aged between 40 and 50 years for their first exploration. The high risk of complications occurring in old age is linked to the absence of a preliminary screening. Without doubt the major benefit of colonoscopy is the detection and treatment of premalignant adenomatous polyps, ensuring a major reduction is the risk of cancer. An excellent strategy is to propose a screening colonoscopy every 10 years, at ages 50, 60 and 70 years if there are no polyps justifying more procedures.

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