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Preliminary assessment of results obtained by the Endoscope Department of Great Poland Cancer Centre, Poznań, in the framework of the Screening Programme for Early Diagnostics of Colon Cancer in years 2004–2005

Authors' Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Data Interpretation
- E** Manuscript Preparation
- F** Literature Search
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Summary

Background

Colonoscopy screening and polypectomy are one of the most effective ways to reduce the incidence of colon cancer. One of the best achievements in Poland is the Colorectal Screening Programme that was started in 2000.

Aim

The aim of our study is to present the results of the examination made by the Endoscope Department of Great Poland Cancer Centre in the framework of the Polish Screening Programme for early diagnosis of colon cancer in the years 2004 and 2005.

Materials/Methods

We admitted to the screening programme asymptomatic persons aged 50–65 years (main group), persons between 40 and 65 years old with familial history of colorectal cancer, and people aged 25–65 from HNPCC or FAP families.

Results

We examined 1000 individuals. 982 total colonoscopies (98.2% effectiveness) were done, and finally 806 polyps were removed. Adenomas were found in 83 removed polyps (10%), including neoplastic lesions in 24 (28.9%) cases: tubulovillous adenomas in 15 (18.1%), villous adenomas in 5 (6.0%) and serrated adenomas in 4 (4.8%) cases. Two of the removed polyps (0.2%) were malignant. Summarized colorectal neoplasia was detected in 26 (2.6%) participants. We observed a 0.9% complication rate among all the participants.

Conclusions

The fundamental importance and consequence of early cancer detection and removal of premalignant adenomatous polyps has been shown to prevent death due to colorectal cancer and to reduce colorectal cancer incidence. Screening by colonoscopy with polypectomy can be an excellent and safe procedure with good levels of acceptability and high level yield for advanced colorectal neoplasia.

Key words

colonoscopy • screening • colorectal cancer

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BACKGROUND

Colorectal cancer is the second most common cancer and the second leading cause of death among men and women in Poland. Colorectal cancer incidence is high (30–35/100,000) and is rising by 2.5% per year. The five-year survival rate does not exceed 25%, which means that about 50% of colorectal patients are already diagnosed at advanced stage. Several methods of colorectal cancer screening appear to be effective in reducing disease-specific mortality, but the cost-effectiveness of different strategies is unclear and still under study. Colorectal cancer is the third most common cancer in both men and women in the United States of America. However, the number of new cases of colorectal cancer and the number of deaths due to colorectal cancer (in the USA) have decreased, which is attributed to increased screening and polyps removal [1]. A number of arguments support the concept that colonic adenomatous polyps are premalignant. In epidemiological studies an association between the occurrence of adenomas and colon cancer was found. Malignant foci have been observed in otherwise benign-appearing adenomas. Histological and genetic markers absent in normal colon mucosa have been found in both benign and malignant neoplasms. Our outcome was the endoscopic detection of significant colorectal neoplasia, which included adenocarcinoma, high-grade dysplasia, villous tissue, adenomas 1 cm or greater and multiple adenomas of any size. Scientists are still studying colorectal cancer screening methods, both alone and in combination, to determine how effective they are. Studies are also under way to clarify the risks of each test. Arguments for colonoscopy as an elementary colorectal screening procedure are: the possibility of direct visualization of the whole colon and to allow biopsy for histopathological examination and/or removal of polyps, leading to reduction of mortality in colorectal cancer [2]. Actually, we know that colonoscopic screening and polypectomy are one of the most effective ways to reduce the incidence of colon can-

cer. One of the best achievements in Poland is the Colorectal Screening Programme that was started in 2000.

AIM

The aim of our study is to present the results of the examination made by our Endoscopy Department in the framework of the Polish Screening Programme for early diagnosis of colon cancer in the years 2004 and 2005.

MATERIALS AND METHODS

We admitted to the screening programme asymptomatic persons between 50 and 65 years old (main group) and between 40 and 65 years with incidence of colorectal cancer in familial history. Finally apart from the above groups we examined people aged 25–65 years from families with syndromes predisposing to colorectal cancer: hereditary nonpolyposis colorectal cancer (HNPCC) or familial adenomatous polyposis (FAP). The last group of patients was also consulted by the Genetics Unit. We invited for screening only by posters. Colonoscopy was chosen as a proper tool for the programme, and as a rule we removed all found polyps which were up to 10 mm in diameter. The larger ones were not treated in the framework of the programme. Management after screening colonoscopy is presented in Table 1.

RESULTS

We examined 1000 (620 women and 380 men) people. We made 982 total colonoscopies (98.2% effectiveness), removing 806 polyps within the group of 179 people (removal from 1 to 34 polyps per case). In 18 cases we were unable to assess the whole colon during the process. Therefore, for these patients we made a complementary examination, such as double contrast barium enema (DCBE). For polyps resection, wire loop and argon plasma coagulation (APC) after forced biopsy were used. All removed polyps were examined

Table 1. Management after colonoscopy in screening programme.

Result	Family history of colon cancer	Recommendation
Norm	Negative	Colonoscopy after 10 years
Norm	Positive	Colonoscopy after 5 years
Adenoma size smaller than 10mm after screening polypectomy (1–2)	Negative	Colonoscopy after 10 years
Adenoma size smaller than 10mm after screening polypectomy (any number)	Positive	Colonoscopy after 5 years
Adenoma size greater than 1cm (even one), many more adenomas or contraindications against ambulatory care polypectomy	No significance	Endoscopic treatment outside the programme
Large size flat adenomas	No significance	Endoscopic treatment outside programme
Colorectal cancer	Positive first-degree relative examinations	Surgical treatment
Patients with hnpcc and fap	According to definition	Dependent on results of colonoscopy and genetic counselling; colonoscopy after 2–3 years or surgical treatment
Inadequate bowel preparation		Colonoscopy again after one more bowel preparation – individual decision
Other cases		Individual recommendation

Table 2. Histological types of removed polyps.

Adenomas	83	(10.0%)
Hyperplastic polyps	76	(9.4%)
Chronic inflammatory (non-specific)	17	(2.0%)
Leiomyoma	1	(0.12%)
Malignant polyps	2	(0.2%)

by a histopathologist. We performed 109 APC, 44 wire loops and 26 APC and loop together procedures. 10 patients with polyps (of diameter 10–40 mm) were not included in the programme. They were referred for hospital treatment. We performed in 7 cases endoscopic polypectomies and in 3 cases open surgery resections. Histological examination revealed that two of the removed polyps (0.2%) were malignant. In both cases the polypectomy was sufficient treatment. The excision line was free of the invasive carcinoma and the margin of healthy tissue was large enough. In a number of removed polyps the domination of hyperplastic polyps was enormous. Adenomas were found in 83 removed polyps (10%), including neoplastic lesions in 24 (28.9%) cases: tubulovillous adenomas in 15 (18.1%), villous adenomas in 5 (6.0%) and serrated adenomas in 4 (4.8%) cases. The histological types of removed

Table 3. Histological types of adenomas.

Adenomas	Tubular	59	(71.1%)
	Tubulovillous	15	(18.1%)
	Villous	5	(6.0%)
	Serrated	4	(4.8%)

polyps and types of adenomas are presented in Tables 2 and 3. We observed in 9 (5%) cases such complications as bleeding (1 case), postpolypectomy coagulation syndrome (1 case) and extended abdominal pain (7 cases). Second colonoscopy with APC in the case with bleeding and conservative therapy in other cases were enough. Two patients were hospitalized for 1 (the patient with bleeding) and 5 days (the patient with postpolypectomy coagulation syndrome). There were no serious complications. All complications are presented in Table 4.

DISCUSSION

Early diagnosis of colorectal cancer, like other kinds of cancers, is the basis of successful treatment. Because of involvement of some polyps in colorectal cancerogenesis many prevention

Table 4. Complications.

Complication	Part of colon	Method of removal	Number of cases – 179	Hospital stay	Treatment
Bleeding	Caecum	Loop	1 (0.6%)	1 day	Second colonoscopy apc
Postpolypectomy coagulation syndrome	Sigmoid	Loop	1 (0.6%)	5 days	Conservative
Abdominal pain (1–2 H.)	All	APC (a lot of polyps)	7 (3.9%)	0	Toilet – decompression necessary

programmes are focused on detecting and removing them. The term intestinal polyp is used to describe any projection arising from flat mucosa into the intestinal lumen. Polyps can be classified as neoplastic and nonneoplastic. Neoplastic polyps can be further classified as either adenomatous (pre-malignant) or malignant. Approximately 95% of all colorectal carcinomas are believed to arise from adenomas, a finding that underscores the importance of treatment and surveillance of adenomas of the gastrointestinal tract. Adenomas represent approximately 60% of all polyps removed during colonoscopic examination of the colon. The cancer risk of adenomas is related to their macroscopic appearance (i.e. size, attachment, location) as well as their microscopic architecture and degree of dysplasia. These descriptors are used clinically to predict the malignant potential of a polyp and to guide both treatment and future surveillance intervals. In our examinations we have looked for colorectal neoplasia, which included adenocarcinoma, high-grade dysplasia, villous tissue, adenomas 1 cm or greater and multiple adenomas. Colorectal cancer is believed to progress through an adenoma-carcinoma sequence. However, recent evidence increasingly supports the existence of an alternative route for colorectal carcinogenesis through serrated polyps, a group that encompasses a morphological spectrum, including hyperplastic polyp, admixed hyperplastic polyp/adenoma, and serrated adenoma; the latter two manifest epithelial dysplasia. In our examination we performed polypectomy in 179 (18.2%) participants. Adenomas were found in 83 removed polyps (10%), including neoplastic lesions in 24 (28.9%) cases: tubulovillous adenomas in 15 (18.1%), villous adenomas in 5 (6.0%) and serrated adenomas in 4 (4.8%) cases. Two of the removed polyps (0.2%) were malignant. In summary, we detected colorectal neoplasia in 26 (2.6%) participants. Our results form only a small part

of the Polish Screening Programme for early diagnosis of colon cancer. In autumn 2000 screening colonoscopy was introduced into the National Cancer Prevention Programme in Poland. So far, 50,148 participants' colonoscopies have been performed. Advanced neoplasia was detected in 2553 (5.9%) participants from 50 to 66 years old and in 243 (3.4%) participants between 40 and 49 years old. The rate of complications during colonoscopy was 0.1%, and no participants died. We observed a 0.9% rate of complications among all participants. Most of the situations regarded as complications after polypectomy should be named "incidental events" rather than "complications", as they can often be successfully treated in the polypectomy process. The most frequent complication, abdominal pain, is a result of flatulence made by argon, a noble gas dispersing into the large and small bowel very quickly during APC. According to the literature data screening by colonoscopy is invasive and may cause haemorrhage in 1:500 patients and colonic perforation in 1:2000 [3] but in our opinion colonoscopy and colonoscopic polypectomy are safe techniques.

It was found that advanced neoplasia occurs at a significantly higher rate in men than in women, which may warrant refinement of the screening recommendations for colorectal cancer [4]. In October 2002 screening colonoscopy was introduced into the National Cancer Prevention Programme in Germany. A total of 109,989 colonoscopies (43% in males) were evaluated from October 2003 to July 2005. In most of the polyps immediate polypectomy was carried out. The complication rate was low (0.1%) and no deaths were observed. Neoplasias of the colon were detected in about 20% of persons who had taken part in a colonoscopy screening programme. The high rate of early stages of colorectal cancers detected by screening colonoscopy is an indirect indicator of mortality reduction. In Germany screening colonoscopy

has a low risk [5]. Colonoscopy screening is still controversial. A lot of authors have tried to prove the worth of sigmoidoscopy as a useful tool of screening [6]. We know that flexible sigmoidoscopy screening of the average risk population has been recommended as one of the screening options to reduce both incidence and mortality [7,8]. Clinical findings for screening flexible sigmoidoscopy have already been reported for the European trials [9–11]. In the PLCO (Prostate, Lung, Colorectal and Ovarian (PLCO) cancer screening trial) trial, 80% of colorectal cancers associated with positive sigmoidoscopy were discovered in the distal colon, as one might expect from a procedure that examines the distal colon primarily. However, the induction of colonoscopy by screening enables evaluation and treatment of the proximal colon. Detection of any adenoma is a positive factor qualifying for full colonoscopy and the final results of cost-effectiveness assessment are more unfavourable for sigmoidoscopy than colonoscopy screening. Lieberman and Weiss studied 2885 asymptomatic subjects aged 50–75 years who provided stool specimens and underwent a complete colonoscopy [2]. Examination of the first 60 cm of the rectum and sigmoid colon during colonoscopy was used as a surrogate for sigmoidoscopy, and “any adenoma” was defined as a positive screening test. They concluded that only sigmoidoscopy would miss about 30% of patients with advanced proximal neoplasms.

Colorectal cancer is a common disease with a long lead-time and easily recognized precursor lesions, making screening a rational and effective means of prevention. Colonoscopy from age 50 is accepted as an accurate and cost-effective screening modality of colorectal cancer screening with high specificity and low false-positive rate but is not yet the ‘preferred’ strategy [2,12,13]. In these conditions despite the risk, inconvenience and cost, colonoscopy is a valid primary screening tool for colorectal cancer. A large number of patients with adenomas are now being uncovered as a result of the increased use of colorectal cancer screening, particularly the dramatic increase in screening colonoscopy, which places a huge burden on medical resources applied to surveillance [14–16]. In populations where colonoscopy screening was done the number of deaths due to colorectal cancer has decreased, which is attributed to increased examination participation and polyp removal [1]. Therefore, there is a need for increased efficiency of surveillance colonoscopy practices to reduce the cost and risk and increase the availability of prophylactic colonoscopy.

CONCLUSIONS

Finally based on our own experience and literature data we conclude that: (i) fundamental importance and consequence of early cancer detection and removal of premalignant adenomatous polyps has been shown to prevent death due to colorectal cancer and to reduce colorectal cancer incidence; (ii) screening by colonoscopy with polypectomy can be an excellent and safe procedure with good levels of acceptability, and high level yield for advanced colorectal neoplasia.

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