ABSTRACT

The primary goal of this paper is to evaluate the efficiency of the Colorectal Cancer Screening Program in the Osijek-Baranja County. The screening method for early detection of colorectal cancer was the guaiac Faecal Occult Blood Test (gFOBT) and colonoscopy for gFOBT positive finding. The target population were asymptomatic subjects at average risk, aged 50–74. The responding rate was 20.3% (14.9% of men and 19.3% of women). The percentage of gFOBT positive tests was 8.5% (11.2% of men and 6.6% of women). From the 1,657 individuals who were invited to further assessment (884 men and 773 women), 1,157 underwent a colonoscopy exam (649 men and 508 women). We can conclude that the response to FOBT in our county was extremely poor. 83 carcinomas were found, with almost double findings among men than among women. Our population has a significantly higher number of men with malignant and premalignant changes when compared with women. Considering the higher incidence among men, as well as an increase in incidence in the entire population, we have to take care that our public health programmes are being created with this taken into account, as to increase the response rate, especially among those with a higher risk of developing a disease.

Key words: colorectal cancer, screening program, Osijek-Baranja County

Introduction

Colorectal cancer (CRC) is the third most prevalent human cancer worldwide, with 1 million estimated new cases annually. Low socioeconomic status (SES) is associated with an increased risk for the development of colorectal cancer; one study estimated the CRC risk to be about 30 percent increased in the lowest as compared to the highest SES quintile. Unhealthy behaviour such as physical inactivity, unhealthy diet, smoking, and obesity are thought to account for a substantial proportion (estimates of one-third to one-half) of the socioeconomic disparity in risk of new onset colorectal cancer. CRC incidence and mortality rates vary markedly around the world. Globally, CRC is the third most commonly diagnosed cancer in males and the second in females, with over 1.2 million new cases and 608,700 deaths estimated to have occurred in 2008. The highest incidence rates are in Australia and New Zealand, Europe and North America, and the lowest rates are found in Africa and South-Central Asia. These geographic differences appear to be attributable to differences in dietary and environmental exposures that are imposed upon a background of genetically determined susceptibility. The incidence of CRC is higher for men, and the risk of the disease increases with age, as the majority of cases are diagnosed in patients more than 50 years of age. From 2005–2009, the median age at diagnosis for cancer of the colon and rectum was 69 years of age.
In Croatia there has been an increase in CRC incidence from 34.5/100,000 (1990) to 64/100,000 (2005), as well as an increase in mortality from 21.9/100,000 (1990) to 40.6/100,000 (2006)\textsuperscript{2}–\textsuperscript{5}. An increase in incidence can also be seen in the Osijek-Baranja County (OBC) (Table 1).

Considering our county is in a depopulation phase, and that the age structure is continuing to lean toward older generations, a further increase in incidence of colorectal carcinoma, as well as the ensuing burdening of the health sector, can be expected.

In 2003, recommendations for screening programs were issued by the Council of the European Union (EU). A screening program of one sort or another has been implemented in 19 of 27 EU countries. Response to the screening is as follows: 52% in the United Kingdom\textsuperscript{26}, 42% in France (2.7% positive)\textsuperscript{27}, 48.0% in Italy (5.5% positive)\textsuperscript{28}, 70.8% in Finland (women)\textsuperscript{29}, 20% in the Czech Republic\textsuperscript{30}. In Croatia, The National Program of Prevention and Early Detection of Colorectal Cancer started on November 2007.

**Material and Methods**

The screening method for early detection of colorectal cancer was the guaiac Faecal Occult Blood Test (gFOBT). The target population were asymptomatic population at average risk, aged 50–74. The target population was 105,075 people, compromising 31.2% of the county’s population. The expected time of one screening cycle was 2 years. Invitation letters have been sent by mail. In an envelope, there are three gFOBT with instructions for their use (because adenomatous polyps and cancers are thought to bleed intermittently, gFOBT require four samples from three different feces), a questionnaire about risk factors and an educational brochure. The respondents were given detailed instructions on how to diet before sampling. The tests were processed without rehydration. The analysis of data from the questionnaires will assess the prevalence of risk factors in the population. Invited people have been asked to mail applied testing-cards back together with a filled out questionnaire. People testing positive are invited for colonoscopy in the Clinical Hospital Centre Osijek by mail.

The individuals who tested positive for gFOBT were invited to undergo a colonoscopy examination. During colonoscopy examination the premalignant lesions are removed and the samples are sent for histopathological analysis. The patients were referred to colonoscopy surveillance if appropriate, depending on the results of the analysis. The colonoscopy results were collected and analysed in the Institute of Public Health. In first year of program implementation the central database for online data input was established. The results of testing, colonoscopy and Question form collecting and input in the County Institute of Public Health.

The histologic classification of polyps and cancers was based on World Health Organization criteria\textsuperscript{31}. Advanced adenoma was defined as an adenoma with any of the following features: adenomas larger than 9 mm or with villous component >20% or with high dysplasia\textsuperscript{32,33}. The risk of malignancy within an adenomatous polyp correlates with size, histologic type, and degree of dysplasia\textsuperscript{34}. Cancer was defined as the invasion of malignant cells beyond the muscularis mucosae. Patients with intramuscular carcinoma or carcinoma in situ were classified as having high-grade dysplasia.

**Statistical analysis**

Contingency tables were used in the analysis. The software SAS for Windows (version 8.2, SAS Institute Inc, Cary, NC) was used for the analysis\textsuperscript{35}.

**Results**

Until February 2013 we sent FOBT to 105,075 individuals (100.0% of target population); 48,678 men and 56,397 women. 8,609 (4.635 men and 3.974 women) had declared themselves unwilling to undergo testing (Table 2). The responding rate (of those who received the invitation) was 20.3% (14.9% of men and 19.3% of women). The percentage of FOBT positive tests was 8.5% (11.2%
of men and 6.6% of women). From the 1,657 individuals who were invited (884 men and 773 women), 1,157 underwent a colonoscopy exam (649 men and 508 women). 87.6% had a pathological finding, 92.0% in men and 82.1% in women. There were 83 newly discovered carcinomas (7.2% of those who underwent colonoscopy), 599 polyps (51.8%), 196 haemorrhoids (16.9%), 87 diverticula (7.5%) and 49 other diagnoses (4.2%). 306 polyps was advanced adenomas (26.4%). In 143 individuals the findings were without pathological findings (12.4%).

Discussion

CRC is the second most frequent malignant disease in developed countries\textsuperscript{36}. It has been estimated that in 2006, 412,000 people were diagnosed with CRC in Europe, and 207,400 of them died of the disease\textsuperscript{37}. In the Osijek-Baranja County the National programme started in 2007.

gFOBT and optical colonoscopy (OC) are currently recommended for population-based screening programs in Croatia\textsuperscript{38}. Moreover, the European Guidelines on quality assurance for CRC screening has recently recommended fecal immunochemical test (FIT) as the first choice test in place of the guaiac test\textsuperscript{39}. The reason for choosing gFOBT was a big difference in price, as well as the geographic characteristics of the country that prevented transportation of FIT to the lab during the scheduled period (up to 12 hours since the sample collection).

Although the Programme stated an invitation cycle of two years\textsuperscript{38}, we are only concluding the first screening
The reasons for this prolongation were problems in implementation, as well as an inadequate estimation of health sector funds; for instance, an inadequate number of colonoscopies and personnel in colonoscopy units. Up until February 2013 response rate on gFOBT was 22.2% (20.1% of men and 23.9% of women). If we compare the response rate to that of other European countries (GB 52%, France 42%, Italy 48.0%, Finland 70.8%), we can conclude that the response to FOBT in our county is extremely poor, far poorer than expected, but still in line with the rest of Croatia.

The percent of gFOBT positive tests was 8.5%; 11.2% of men and 6.6% of women. Up until now 1,157 colonoscopy exams were conducted in the screening programme. The average response rate to OC was 69.8% which is far lower than in similar Programs in Europe. Perhaps the reason for a low response rate to OC was an invitation via mail and the insufficient education of the population. Simultaneously with sending invitations to OC to the respondent, a message to the GP about the invitation was sent. Thus the GP had the ability to check the reason for not responding to the invitation. The impact on the response to OC was affected by poor preparation for the examination. These subjects are then re-scheduled. One part of the re-scheduled subjects was lost from the records because they came to OC with a GP referral.

Men had as high as 92.0% of pathological findings, while women had 82.1%. 83 (7.2%) carcinoma were found, with almost double findings among men (9.4%) than among women (4.3%). Detection rate (DR) per 1,000 screened subjects for cancer was 4.3‰ (7.7‰ in men and 1.9‰ in women) and for advanced adenomas (AA) was 15.6‰ (25.9‰ in men and 8.6‰ in women) which is much more than e.g. in Italy. USA DR for cancer and advanced adenomas was 20.0‰ (33.7‰ in men and 10.5‰ in women).

We can conclude that the response to gFOBT in our county is extremely poor, far poorer than expected, but still in line with the rest of Croatia. 83 carcinomas were found, with almost thrice findings among men than among women. Our population has a significantly higher number of men with malignant and premalignant changes when compared with women. Considering only one fifth of the population responded to the invite, a rough estimate is that there is a five time larger number of people with malignant and premalignant lesions in the entire population. Early detection means successful treatment and a better quality of life.

The implementation of similar programmes in the world has shown a greater response rate among women and higher socioeconomic classes, as well as the influence of the chosen general practitioner (GP). Considering the higher incidence among men, as well as an increase in incidence in the entire population, we have to take care that our public health programmes are being created with this taken into account, as to increase the response rate, especially among those with a higher risk of developing a disease.

Conclusions

We can conclude that the response to gFOBT in our county is extremely poor, far poorer than expected, but still in line with the rest of Croatia. 83 carcinomas were found, with almost thrice findings among men than among women. Our population has a significantly higher number of men with malignant and premalignant changes when compared with women. Considering only one fifth of the population responded to the invite, a rough estimate is that there is a five time larger number of people with malignant and premalignant lesions in the entire population. Considering the higher incidence among men, as well as an increase in incidence in the entire population, we have to take care that our public health programmes are being created with this taken into account, as to increase the response rate, especially among those with a higher risk of developing a disease.

### Table 4

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>All subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Received a call for colonoscopy</td>
<td>884</td>
<td>773</td>
<td>1657</td>
</tr>
<tr>
<td>Insufficient preparation, died or give up</td>
<td>235</td>
<td>265</td>
<td>500</td>
</tr>
<tr>
<td>Performed the colonoscopy</td>
<td>649</td>
<td>508</td>
<td>1157</td>
</tr>
<tr>
<td>All subjects</td>
<td>884</td>
<td>773</td>
<td>1657</td>
</tr>
<tr>
<td>Normal findings</td>
<td>52</td>
<td>91</td>
<td>143</td>
</tr>
<tr>
<td>Carcinomas</td>
<td>61</td>
<td>22</td>
<td>83</td>
</tr>
<tr>
<td>Polip</td>
<td>379</td>
<td>220</td>
<td>599</td>
</tr>
<tr>
<td>Hemorrhoids</td>
<td>105</td>
<td>91</td>
<td>196</td>
</tr>
<tr>
<td>Diverticulosis</td>
<td>37</td>
<td>50</td>
<td>87</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
<td>34</td>
<td>49</td>
</tr>
<tr>
<td>All findings</td>
<td>649</td>
<td>508</td>
<td>1157</td>
</tr>
</tbody>
</table>

#### Notes

- DR for cancer and advanced adenomas was 20.0‰ (33.7‰ in men and 10.5‰ in women).
- The implementation of similar programmes in the world has shown a greater response rate among women and higher socioeconomic classes, as well as the influence of the chosen general practitioner (GP).
- Considering the higher incidence among men, as well as an increase in incidence in the entire population, we have to take care that our public health programmes are being created with this taken into account, as to increase the response rate, especially among those with a higher risk of developing a disease.
S. Samardžić et al.: First Six Years of Implementing CCS in the Osijek-Baranja County, Coll. Antropol. 37 (2013) 3: 913–918

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PRVII ŠEST GODINA IMPLEMENTACIJE PROGRAMA RANOG OТKRIVANJA RAKA DEBELOG CRJEVA U OŠJEKO-CARANJSKOJ ŽUPANIJI – MOŽEMO LI BOLJE?

SAŽETAK


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osoba (884 muškaraca i 773 žena) a odazvalo se 1157 osoba (649 muškaraca i 508 žena). U populaciji muškaraca je značajno veći udio malignih i premalignih promjena. Obzirom da se na rano otkrivanje odazvala petina populacije, gruba procjena da je u populaciji pet puta više osoba s malignim i premalignim lezijama. Iskustva u provođenju Nacionalnog programa potrebno je implementirati u slijedeće cikluse kako bi povećali odaziv, a time otkrili premaljne promjene na vrijeme i povećali preživljavanje oboljelih od kolorektalnog karcinoma, te povećali kvalitetu života oboljelih.

S. Samardžić et al.: First Six Years of Implementing CCS in the Osijek-Baranja County, Coll. Antropol. 37 (2013) 3: 913–918