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ANALYSIS OF RISK FACTORS OF COLORECTAL CARCINOMA AND RECOMMENDATIONS FOR PREVENTION

Summary. This paper is focused on the awareness of public regarding prevention of colorectal carcinoma and education in this field. If we look at the lives of our ancestors, we can see that our lives are far more comfortable. Technologies that surround us in every step we take make our lives easier but our pace is faster and faster and that takes toll on our lifestyle – we have less exercise outdoors, bad eating habits, we smoke, drink alcohol, we use drugs and we do not sleep enough. All these factors create stress and strain. Unhealthy lifestyle has lead to overall deterioration of people's health, cardiovascular diseases, mental disorders or increase of tumor diseases. In the Czech Republic, colorectal carcinoma holds the second position in the incidence of tumor diseases and Czech men have the highest incidence of colorectal carcinoma in the world. That is why it is so important to make prevention a part of our lives to try to avoid this serious disease.

Key words: *colorectal carcinoma, prevention, risk factors.*

Introduction

Colorectal carcinoma (CRC) is one of the most serious and also the most frequent oncologic diseases of the digestive system. It arises from cells that cover the colon and rectum, i.e. from the epithelial cells. These cells are subject to changes that result in cancer growth. From the histological point of view CRC belongs to the adenocarcinoma group. Via bloodstream CRC most often metastasizes into liver, bones and lungs. CRC develops slowly, usually from seven to ten years which is good for timely detection and treatment. CRC has four stages. At the first stage, the mucosa and submucosal connective tissues are affected. At the second stage, all layers of the colon wall are struck. At the third stage, the lymphatic nodes are affected and at the fourth, remote metastases emerge (Vyzula, 2007).

Jbvestka states that CRC is most usually detected in the rectum area (30-60 %) and also in sigmoidum (26-30 %), colon descendens (8 %), colon transversum (13 %), colon ascendens (9 %) and in the caecum area (14 %) (Švestka, 2011).

Most frequently the colorectal carcinoma arises from polypi and that is why we need to see them as precancerous condition. Further conditions that can result in colorectal carcinoma are idiopathic colonic inflammations: ulcerative colitis and Crohn's disease. In these inflammations the risk of colorectal carcinoma rises accordingly to the duration and extent of the colonic inflammation. Last but not least we must not ignore genetic predisposition. The most frequent risk factors are age over 50, smoking, drinking alcohol, occurrence of CRC in the family and diet low in calcium and folic acid on one hand and rich in animal fats on the other. The emergence of the disease is also facilitated by low physical activity, overweight or sedentary job. The key role in

the etiopathogenesis is played by consumption of red or smoked meats (Seifert, 2012).

Prevention is the most efficient and the cheapest measure against oncologic diseases. Nurses play an important role in prevention as they can notice the first symptoms. Nurses are also capable of providing necessary information about risk factors and timely diagnosis of an oncologic disease in an appropriate and comprehensible way (Vorlíček, Abrahámová, Vorlíčková et al., 2012).

The purposes of research

The purposes of research were: to determine the level of awareness of risk factors and prevention of colorectal carcinoma; to determine whether the knowledge of risk factors and prevention of colorectal carcinoma is different in various categories of respondents; to determine whether the respondents comply with the principles of healthy lifestyle; to suggest measures to improve the public awareness of risk factors and prevention of colorectal carcinoma.

Material and methods

We acquired our research data via an anonymous questionnaire. We addressed a random pattern of population (mostly acquaintances and friends) and asked them to fill out the questionnaires. Every respondent was informed about the purpose of the research and anonymity was emphasized. We did not assist during completing the forms, we only answered some questions. The respondents had no time limit for filling out the questionnaires. We kept addressing further respondents until we collected one hundred properly completed questionnaires.

The questionnaire drafted to acquire our research data consisted of an introductory part containing the basic demographic data (age and sex) and

main part where we scrutinized respondents' opinions, attitudes and knowledge. In this part we used 14 closed questions, each with a set of answers to choose from or with Likert scale expressing the degree of consent, and two open questions where the respondents could present their opinions.

We arranged the research data necessary for testing our hypotheses into tables and charts for the sake of transparency. During the data procedure we used basic mathematic methods to determine averages, summation, percentage or difference. In our calculations and in formation of the individual formulas, we used the function Equation and Insert function in Excel, Microsoft Office 2013 by Microsoft Corporation (Hendl 2006).

The main results and discussion

From the total sum of 100 respondents, 36 (36 %) belonged to the age group from 20 to 29 years, 24 (24 %) to the age group from 30 to 39 years, 16 (16 %) to the age group from 40 to 49 years, 13 (13 %) to the age group from 50 to 59 years and 11 (11 %) to the age group 60+.

Chart 1. Age of respondents (in years)

From the total count of 100 respondents, 51 (51 %) were women and 49 (49 %) were men.

We assume that the respondents aged under 40 years will have more information about risk factors of colorectal carcinoma than respondents aged over 40.

Chart 2. Sex of respondents

To verify the validity of this assumption we posed a question: "Choose risk factors that contribute to colorectal carcinoma". The respondents could select from these answers: age, heredity, frequent intake of pain medication, lifestyle and sex. The only wrong answer was "frequent intake of pain medica-

tion". The acquired answers in relation to age categories are shown in Chart 3.

Chart 3. Awareness of risk factors that contribute to tumor disease of colon (comparison of age groups)

As a risk factor for colorectal carcinoma, the age was indicated by 27 respondents under 40 (45 %) and 19 respondents over 40 (48 %), the heredity was indicated by 39 respondents under 40 (65 %) and 28 respondents over 40 (70 %), frequent use of pain medication was indicated by 12 respondents under 40 (20 %) and 4 respondents over 40 (10 %), lifestyle was indicated by 56 respondents under 40 years (93 %) and 34 respondents over 40 (85 %) and sex was indicated by 16 respondents under 40 years (27 %) and 3 respondents over 40 years (8 %).

To compare the answers, we counted up all correct answers and divided them by the maximum number of correct answers. Respondents under 40 years achieved 58 % of the maximum score whereas respondents over 40 achieved 53 % of the maximum score. Higher score of the younger group was in accordance with our hypothesis. To verify whether this difference is statistically significant, we made a statistical test.

We received a higher score in the group of respondents younger than 40 years but this difference showed as statistically insignificant when tested.

Another question which we formulated was: "The first information about risk factors for colorectal carcinoma was provided to me by:...". The respondents had a choice from a range of answers: a general practitioner, a nurse, media, "I have not received any such information so far" and "I am not interested". The answers are summed up in Chart 4 and grouped by age categories.

The first information about risk factors for colorectal carcinoma was provided by their general practitioner to five respondents under 40 (8 %) and 6 respondents over 40 (15 %). No respondent under 40 received the information by a nurse (0 %) and one respondent over 40 (3 %) mentioned this source. 38 respondents under 40 (63 %) came across this information in media and similarly 30 respondents over 40 years (75 %). As many as 14 respondents under 40 (23 %) and 2 respondents over 40 (5 %) denied to have received any information at all and 3 respondents under 40 (5 %) and 1 respondent over 40 (3 %) stated that they were not interested.

Chart 4. Source of the first information about risk factors for colorectal carcinoma

To compare the responses, we counted up positive answers and divided them by the maximum possible score of positive answers. Respondents under 40 achieved 72 % of the maximum score and respondents over 40 achieved 83 % of the maximum score.

Higher score of the latter group contradicted our hypothesis. Therefore, the subsequent statistical testing of the difference lacked purpose. We concluded that this hypothesis was not confirmed by our question “The first information about risk factors for colorectal carcinoma was provided to me by: ...”.

Next our assumption was that women will be better informed about the prevention of colorectal carcinoma than men.

To verify this hypothesis, we formulated question in the form of a statement: “The information about prevention of colorectal carcinoma that I received from my doctor was sufficient.” The respondents could choose from these answers: “I agree completely”, “I rather agree”, “I do not know”, “I rather disagree” and “I completely disagree”. Their answers are summed up in Chart 5.

Chart 5. Sufficiency of information about prevention of colorectal carcinoma

From all respondents, 8 women (16 %) and 7 men (14 %) completely agree, 5 women (10 %) and 11 men (22 %) rather agree, 7 women (14 %) and 9 men (18 %) do not know, 13 women (25 %) and 11 men (22 %) rather disagree and 18 women (35 %) and 11 men (22 %) completely disagree with the sentence

“The information about prevention of colorectal carcinoma that I received from my doctor was sufficient”.

To compare the answers, we gave every item a value from 5 (I completely agree) to 1 (I completely disagree). We calculated the average value of women’s responses (2.54, i.e. 49 % of the maximum score) and the average value of men’s responses (2.84, i.e. 57 % of the maximum score). We could see from the numbers that women do not feel to be better informed about prevention than men, which was an opposite of what we had expected in our hypothesis. For this reason, the statistic testing of statistical significance of the difference lacked purpose. Our hypothesis was not confirmed by question “The information about prevention of colorectal carcinoma that I received from my doctor was sufficient”.

Then we formulated next question in the form of a statement: “I am interested in prevention of colorectal carcinoma.” The respondents could choose from these answers: “I completely agree”, “I rather agree”, “I do not know”, “I rather disagree” and “I completely disagree”. Their responses are summed up in Chart 6.

Chart 6. Interest in prevention of colorectal carcinoma

From all respondents, 9 women (18 %) and 9 men (18 %) completely agree, 16 women (31 %) and 8 men (16 %) rather agree, no woman (0 %) and 10 men (20 %) do not know, 21 women (41 %) and 16 men (33 %) rather disagree and 5 women (10 %) and 6 men (12 %) completely disagree with the statement “I am interested in prevention of colorectal carcinoma.”

To compare the answers, we gave every item a value from 5 (I completely agree) to 1 (I completely disagree). We calculated the average value of women’s responses (3.06, i.e. 61 % of the maximum score) and the average value of men’s responses (2.96, i.e. 59 % of the maximum score). It is apparent that women feel to be better informed about prevention than men, as we had presumed in the hypothesis. To verify whether this difference is statistically significant we exercised a statistical test and determined this zero and alternative hypothesis: H0: Women will be informed about the prevention

of colorectal carcinoma as well as men. H1: Women will be informed about the prevention of colorectal carcinoma better than men.

Our hypothesis was thus not confirmed with testing by question “I am interested in prevention of colorectal carcinoma.” We received a higher score in the group of women but this difference showed as statistically insignificant when tested.

To verify another hypothesis we formulated such question: “The first information about risk factors for colorectal carcinoma was provided to me by:...”. The respondents had a choice from a range of answers: a general practitioner, a nurse, media, “I have not received any such information yet” and “I am not interested”. The answers are shown in Chart 7 and grouped by sex.

Chart 7. The first source of information about risk factors for colorectal carcinoma

The first information about risk factors for colorectal carcinoma was provided by their general practitioner to 8 women (16 %) and 11 men (22 %). One woman (2 %) and no man (0 %) received the information by a nurse. 33 women (65 %) came across this information in media and similarly 25 men (51 %). As many as 12 women (24 %) and 9 men (18 %) denied to have received any information at all and no woman (0 %) and 7 men (14 %) stated that they were not interested.

To compare the answers, we assigned a value of 1 to positive answers and a zero value to negative answers. It is apparent from the mathematic comparison of average assessment by women (78 % of the maximum score) and men (69 %) of the maximum score that women feel to be better informed about prevention than men as we assumed in our hypothesis. To verify whether this difference is statistically significant, we exercised a statistical test. To make a statistic test we determined this zero and alternative hypothesis: H0: Women will be informed about the prevention of colorectal carcinoma as well as men. H1: Women will be informed about the prevention of colorectal carcinoma better than men. We received a higher score in the group of women but this difference showed as statistically insignificant when tested.

We also tested next hypothesis and formulated question: “What are the methods of timely diagnosis of colorectal carcinoma?”. The respondents had a choice from a range of answers: “blood in stool test”, “gastroscopy”, “colonoscopy” and “blood test”. The only incorrect answer was the B choice – gastroscopy.

As many as 42 women (82 %) and 30 men (61 %) chose “blood in stool test”, 2 women (4 %) and 1 man (2 %) chose “gastroscopy”, 35 women (69 %) and 30 men (61 %) chose “colonoscopy” and 15 women (29 %) and 5 men (10 %) chose “blood test” as their answer to the question “What are the methods of colorectal carcinoma?”. In women the score was 60 % of possible correct answers and in men the score was 44 % of possible correct answers, as we had assumed in our hypothesis. To verify whether this difference is statistically significant, we exercised a statistical test.

Our hypothesis was thus confirmed with testing by question “What are the methods of timely diagnosis of colorectal carcinoma?” We received a higher score in the group of women and this difference showed as statistically significant when tested.

We analysed the results of our research with another similar works provided by another authors. For example, in 2014, Rice et al. from South Carolina, USA published outputs of their research. The aim of their research was to find out how their respondents perceive the risks of cancer and how the perception is related to the demographic data. As many as 405 respondents took part in that research. The authors concluded that 37 % of respondents consider the risk of cancer to be low, reasoning their belief with examples from their family and environment. Abstainers, people who had gone through colon examination, women and people between 25 and 40 years proved to have lower perception of the risk. Smokers and respondents with bad eating habits stated higher perception of the risk of cancer (Rice, 2014). In the same period Gimedo Garcia et al. published an analysis exercised in Spain. The authors analysed available researches dealing with public awareness of colorectal carcinoma. They came to the conclusion that in most of the researches the knowledge of respondents and their willingness to undergo testing for CRC depend on their education. People from higher income groups have better attitude to prevention and testing. People with CRC diagnosis in their families get tested more often. Men get tested more often than women but this difference decreases with the course of time and is insignificant. People who live in marriage get tested more often than singles and the couples often undergo the testing at the same time. The biggest barrier according to the researchers was lack of information about the issue, followed by fear from testing and embarrassment (Gimero et al., 2014).

Conclusion

The cause of high mortality rate for CRC is above all the fact that most tumors are diagnosed at an advanced stage. We can expect significant improvement only in connection with methods of primary and secondary prevention. Timely diagnosis of CRC is based on screening of asymptomatic people over 50 years of age. The success of the screening strategy is conditional on both professional and organi-

zational preparedness, economical assurance and patients' compliance (Vyzula, 2007).

The most efficient and the cheapest measure against oncologic diseases is prevention. The prevention is focused on timely search for ill people and their timely treatment. Screening is a global method of testing healthy population to reveal tumor diseases in their early stages when patients do not have any problems or symptoms.

REFERENCES

1. Gimeno G., Hernandez N., Nicolas-Perez D., Quintero E. Public awareness of colorectal cancer screening: knowledge, attitudes, and interventions for increasing screening uptake. *Oncol.* 2014 Mar 5;2014:425787. doi: 10.1155/2014/425787. eCollection 2014.
2. Hendl, J. 2006. Přehled statistických metod. Praha : Portál, 2006. 583 s. ISBN 80-7367- 123-9.
3. Khayyat YM., Ibrahim EM., Public awareness of colon cancer screening among the general population: A study from the Western Region of Saudi Arabia. *Qatar Med J.* 2014 Jun 16;2014(1):17-24. doi: 10.5339/qmj.2014.3. eCollection 2014.
4. Rice, LJ. a kol. 20014. Exploring Perceptions of Cancer Risk, Neighborhood Environmental Risks, and Health Behaviors of Blacks. *J Community Health.* 2014 Oct 15.
5. Seifert, B. 2012. Screening kolorektálního karcinomu. 1. vyd. Praha : Maxdorf, 2012. 112 s. ISBN 978-80-7345-306-0.
6. Vorlíček J., Abrahámová J., Vorlíčková H. 2012. Klinická onkologie pro sestry. 1. vyd. Praha : Grada, 2012. 448 s. ISBN 978-80-247-3742-3.
7. Vyzula R., Žaloudník J. a kol. 2007. Rakovina tlustého střeva a konečníku. 1. vyd. Praha : MAXDORF, 2007. 287 s. ISBN 978-80-7345-140-0.
8. Weber MF, Banks E., Ward R., Sitas F. 2008. Population characteristics related to colorectal cancer testing in New South Wales, Australia: results from the 45 and Up Study cohort. *J Med Screen.* 2008;15(3):137-42. doi: 10.1258/jms.2008.008050.

АНАЛІЗ ФАКТОРІВ РИЗИКУ КОЛОРЕКТАЛЬНОЇ КАРЦИНОМИ ТА РЕКОМЕНДАЦІЇ ДЛЯ ПРОФІЛАКТИКИ

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Резюме. Ця стаття зосереджена на обізнаності громадськості щодо профілактики колоректальної карциноми та освіти в цій галузі. Якщо ми подивимось на життя наших предків, то можемо побачити, що наше життя набагато комфортніше. Технології, які нас оточують на кожному кроці, який ми робимо, полегшують наше життя, але наш темп швидший і швидший, і це впливає на наш спосіб життя - у нас менше фізичних вправ на відкритому повітрі, шкідливих харчових звичок, ми куримо, вживаємо алкоголь, вживаємо наркотики і робимо недосипати. Всі ці фактори створюють стрес і напругу. Нездоровий спосіб життя призвів до загального погіршення здоров'я людей, серцево-судинних захворювань, психічних розладів або збільшення пухлинних захворювань. У Чеській Республіці колоректальна карцинома займає друге місце за захворюваністю на пухлинні захворювання, а чеські чоловіки мають найвищу частоту захворювань на колоректальну рак у світі. Ось чому так важливо зробити профілактику частиною нашого життя, щоб спробувати уникнути цього серйозного захворювання.

Ключові слова: колоректальна рак, профілактика, фактори ризику.

АНАЛИЗ ФАКТОРОВ РИСКА КОЛОРЕКТАЛЬНОЙ КАРЦИНОМЫ И РЕКОМЕНДАЦИИ ДЛЯ ПРОФИЛАКТИКИ

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Резюме. Эта статья направлена на информирование общественности о профилактике колоректального рака и обучении в этой области. Если мы посмотрим на жизнь наших предков, мы увидим, что наша жизнь намного комфортнее. Технологии, которые окружают нас на каждом шагу, делают нашу жизнь проще, но наш темп все быстрее и быстрее сказывается на нашем образе жизни: у нас меньше физических упражнений на свежем воздухе, вредные привычки в еде, мы курим, употребляем алкоголь, употребляем наркотики и делаем недостаточно спать. Все эти факторы создают стресс и напряжение. Нездоровый образ жизни привел к общему ухудшению здоровья людей, сердечно-сосудистым заболеваниям, психическим расстройствам или росту опухолевых заболеваний. В Чешской Республике колоректальная карцинома занимает второе место по заболеваемости опухолями, а чешские мужчины имеют самую высокую заболеваемость колоректальной карциномой в мире. Вот почему так важно, чтобы профилактика стала частью нашей жизни, чтобы избежать этой серьезной болезни.

Ключевые слова: колоректальный рак, профилактика, факторы риска.