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Araştırma / Research Article

The relationship between the frequency of consumption of dietary fiber and colon cancer

Diyet lifi tüketim sıklığı ile kolon kanseri arasındaki ilişki

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ABSTRACT

Objective: The study was carried out to determine the frequency of pre-disease dietary fiber consumption in patients with colon cancer and to associate it with colon cancer. **Method:** In January-September 2013, 65 colon cancer patients, 65 healthy adults and 130 individuals in total. The data were obtained through a questionnaire on demographic data and frequency of food consumption. Body mass index was calculated by measuring the weight and height of the participants. **Results:** The mean age of patients with colon cancer was 48 ± 2.4 years, whereas 37 ± 3.6 years were calculated in the control group. Body mass index, colon cancer and obesity rates among the individuals in the control group were: 50.6%, 29.3%, respectively. Patients with colon cancer had higher rates of obesity and malaise in the control group. **Conclusion:** Vegetables in dried legumes are more common in patients with colon cancer than in the control group, while vegetables, fruits and oilseeds are consumed less. In order to meet the needs of the fibers recommended to protect from 25-35 g / day colon cancer, it is thought to be beneficial to consume more fiber-rich foods and to support them with the results of more comprehensive studies.

ÖZET

Amaç: Çalışma, kolon kanserli hastaların, hastalık öncesi diyet lifi tüketim sıklığını saptamak ve kolon kanseriyle ilişkilendirmek amacıyla yapıldı. **Yöntem:** 2013 yılı Ocak-Eylül aylarında, 65 kolon kanseri hastası, 65 sağlıklı yetişkin ile toplam 130 birey üzerinde gerçekleştirilmiştir. Veriler demografik veriler ve gıda tüketim sıklığı ile ilgili anket formu ile elde edilmiştir. Çalışmaya katılanların ağırlık ve boyu ölçülerek, beden kitle indeksi hesaplanmıştır. **Bulgular:** Kolon kanseri olan hastaların yaş ortalaması 48 ± 2.4 iken kontrol grubunda 37 ± 3.6 yıl hesaplanmıştır. Kontrol grubundaki bireyler arasında beden kitle indeksi, kolon kanseri ve obezite oranları sırasıyla: % 50.6, % 29.3 idi. Kolon kanseri olan hastalarda kontrol grubunda obezite, halsizlik oranı daha yüksekti. **Sonuç:** Kolon kanserli hastaların kuru baklagillerdeki sebzeler kontrol grubuna göre daha sık görülürken, sebzeler, meyveler ve yağlı tohumlar daha az tüketilmektedir. 25-35 g / gün kolon kanserinden korunmak için tavsiye edilen liflerin ihtiyaçlarını karşılamak için, lif bakımından zengin gıdaların daha sık tüketilmesi ve daha kapsamlı çalışmaların sonuçlarıyla desteklenmesinin faydalı olduğu düşünülmüştür.

INTRODUCTION

Today, dietary fiber is known to be important in healthy nutrition and disease treatment with its physiological functions, different local and systemic effects in the gastrointestinal tract. In particular, the role of colon cancer prevention has been demonstrated in many scientific studies(1). Dietary fiber protects against bowel diseases including obesity, constipation by increasing bowel movements, cardiovascular diseases by regulating blood fats, and bowel flora by regulating intestinal flora. It passes to the blood slowly and provides better control of diabetes. Research have shown that soluble fiber reduces cholesterol and delays glucose absorption. The fibers bind fecal bile acids and prevent the absorption of cholesterol. Fermentable oligosaccharides and dietary fiber convert to intestinal bacteria and short-chain fatty acids, which, by a mechanism that is still not clear, reduces blood lipids (2).

Colon cancer is the most common type of cancer in the gastrointestinal tract. It is an important cause of morbidity and mortality worldwide, and it is estimated that more than 1 million people develop the disease annually worldwide. When evaluated together with rectal cancer, prostate and lung in men, breast and lung cancer in women is the third most common. Approximately 10% of cancers in men and women are colorectal cancer. In the United States (USA), colorectal cancer is the second leading cause of cancer-related death (3,7).

As with many diseases, it is possible to prevent colon cancer. It is known that negative lifestyle and unbalanced eating habits increase the risk of colon cancer (4). Dietary fiber changes the flora in the colon, reduces the formation of toxic metabolites, accelerates the excretion of feces, shortens the contact time of toxic metabolites with intestinal cells and prevents colon cancer (5).

Studies have shown that regular consumption of fruits and vegetables containing foods has a protective feature in terms of cancer risk, fruits and vegetables contain high potassium, low soy and cholesterol (6, 7, 8). With the emergence of positive effects of dietary fiber, which is functional and functional in fruits and vegetables, on health, the trend towards consumption of these products is increasing day by day (9,10).

In the literature review, a study examining the relationship between dietary fiber consumption and colon cancer was not found in our country. Therefore, this study was planned and applied in a cross-sectional and descriptive manner to investigate the relationship between dietary fiber consumption frequency and colon cancer.

MATERIALS AND METHODS

The sample of the study included inpatients and individuals working in the Oncology Department of a private hospital between in January-September 2013. The study was conducted with the permission of the institution. The universe of his study consists of all patients who come to the clinic. According to the random numbers table, it is divided into two groups as patient and control groups. Adult individuals who volunteered to participate in the study were included in the study. A total of 130 individuals, 69 males and 61 females, aged between 23-67, with 65 colon cancer and 65 without colon cancer, were included in the study. This is a cross-sectional and descriptive study to evaluate the frequency of dietary fiber consumption in patients with colon cancer before disease. The condition of not having colon cancer disease was sought in the individuals working in the hospital. The patients and the control group were informed about the study in advance by informing them and started to work after obtaining their permission. The absence of colon cancer in the control group was specified as the inclusion criteria.

The research data were collected by using the questionnaire form prepared in line with the information obtained from the research questions and the resources obtained from the relevant sources by the researcher. The colon cancer patients who participated in the study were taken as a patient group, and healthy individuals working in the hospital were taken as a control group. While the height and weight information was obtained from the most recent medical records, the height and weight of the case group were measured by the researcher at the Universal Çamlıca Hospital Nutrition and Diet section. It was measured with the 'G-Tech International Co.' height meter device. The BMIs are calculated by dividing the body weight by the square of the height (Body weight (kg) / Height (m2)). Body mass index is classified according to WHO's reference values(6, 8, 13, 24, 20).

In this questionnaire, the demographic information of the individuals and the frequency of food consumption were questioned. The gender, education, marital status, age, family history of illness, smoking, alcohol use were questioned in the scope of the study. In addition, the frequency of consumption of foods in cereals, fruits and oil seed group, especially dairy and meat products, was questioned. The frequency of consumption of food in the study group was evaluated according to the frequency of consumption of the case group in the study period (5,7,8,14,21,23).

SPSS 17.0 program was used for analysis. At the end of the study, descriptive statistics such as frequency, arithmetic mean, standard deviation and percentage were used to analyze the data. Nonparametric tests were used in our analyzes. Spearman's Rho correlation coefficient was used for correlation analysis and Mann-Whitney U test, one of the non-parametric tests, was used for comparisons. Significance was evaluated at $p < 0.05$.

The ethical dimension of the study; all permissions regarding the research were obtained, and a consent form was obtained from the volunteers who participated in the study.

Strengths and weaknesses of working; The limitations of this study were the inability to accurately determine the daily consumption of nutrients due to the small number of adults diagnosed with colon cancer and the data obtained retrospectively during the study. This thesis topic, which is planned as a master's thesis, is recommended to be repeated in larger groups and at different times. In the literature review conducted, no studies examining the relationship between dietary fiber consumption and colon cancer can be found in studies conducted in our country. Therefore, this study was planned and conducted to examine the relationship between dietary fiber consumption frequency and colon cancer.

RESULT

In this study, fiber consumption rates of 130 adults with 65 colon cancer and 65 control groups were examined.

Table 1. Demographic characteristics of cases

		Patient Group		Control Group	
		n	%	n	%
Age	29 age and under	5	7.Tem	21	32.3
	30-39 age difference	21	32.3	17	26.Şub
	40-49 age difference	7	10.Ağu	18	27.Tem
	50 years and older	32	49.2	9	13.Ağu
Gender	Male	34	52.3	35	53.8
	Woman	31	47.7	30	46.2
Marital Status	Married	52	80	31	47.7
	Single	13	20	34	52.3
Education Availability	Primary School	18	27.Tem	7	10.Ağu
	Middle School	8	12.Mar	4	6.Şub
	High school	18	27.Tem	20	30.Ağu
	University	20	30.Ağu	28	43.1
	Other	1	1.May	6	9.Şub
Job	Officer	13	20.0	5	7.Tem
	Worker	15	23.Oca	9	13.Ağu
	Self-employment	8	12.Mar	15	23.Oca
	Student	14	21.May	5	7.Tem
	Not working	15	23.Oca	9	13.Ağu
	Other	0	0	22	33.8

Fifty percent of the patients with colon cancer were under the age and the majority of the control group was under the age of 50 with 86.2%. There was no gender difference between colon cancer patients and control group. 80% of the patients with colon cancer, 48% of the control group were married and the rate of high school education was similar in both groups. Professionally, 23.1% of the cases in the colon cancer group are workers and 23.1% are not working. It was noteworthy that 21.5% of the cases in this group were students. The majority of the cases in the control group (23.1%) were self-employed (Table 1).

Table 2. Distribution of cases by parental health problems

Parent-Health Problem		Patient Group		Control group	
		n	%	n	%
Mother	Hypertension	25	38.5	24	36.9
	Diabetes	5	7.Tem	10	15.Nis
	Kidney Disease	1	1.May	0	0
	Cancer	5	7.Tem	9	13.Ağu
	Cardiovascular	2	3.Oca	0	0
	Healthy	27	41.5	22	33.8
Father	Hypertension	25	38.5	19	29.Şub
	Diabetes	5	7.Tem	0	0
	Kidney Disease	1	1.May	2	3.Oca
	Cancer	3	4.Haz	6	9.Şub
	Cardiovascular	3	4.Haz	4	6.Şub
	Healthy	28	43.1	34	53.3

In the study, 46.2% of the patients in the patient group were slightly overweight, 53.8% in the control group, and 23.1% in the control group. Weakness rate was higher in the control group. Hypertension was found to be significant and similar in the parents of both groups. In the control group, diabetes and cancer, especially in the mother's history, were found to be 2 times more common than the patient group and the second most common disease was diabetes and the third was cancer (Table 2).

Table 3. Average consumption frequency of food groups

Food Group	Group	n	Ort. ± S.S.	p
Milk	Patient Group	62	3.3 ± 0.7	0.055
	Control Group	65	3.4 ± 1.1	
Red and processed meat	Patient Group	56	3.3 ± 0.8	0.004**
	Control Group	65	2.5 ± 0.9	
White meat	Patient Group	62	2.7 ± 1.0	0.010*
	Control Group	65	3.1 ± 0.9	
Processed grain	Patient Group	56	3.1 ± 0.9	0.059
	Control Group	61	3.1 ± 1.4	
Whole grain	Patient Group	59	3.0 ± 1.6	0.208
	Control Group	61	2.8 ± 1.6	
Dry beans	Patient Group	63	2.5 ± 0.9	0.008**
	Control Group	65	2.2 ± 1.1	
Vegetables	Patient Group	60	2.5 ± 0.8	0.013*
	Control Group	65	2.9 ± 0.8	
Fruits	Patient Group	60	2.9 ± 0.9	0.929
	Control Group	65	2.9 ± 1.0	
Oily seeds	Patient Group	60	2.5 ± 1.1	0.021*
	Control Group	65	2.9 ± 1.2	

***p<0.001,**p<0.01, *p<0.05

Red and processed meat consumption of colon cancer patients was found to be more frequent than the control group (p <0.001). White meat consumption was significantly more frequent in the control group

Table 4. Frequency of nutrient consumption by gender of cases

Food Group	Patient gender	n	Ort. ±sd.	p	Control gender	n	Ort. ± sd.	p
Milk red and processed meat	Male	32	3.2 ± 0.6	0.977	Male	35	3.2 ± 0.7	0.232
	Woman	30	3.3 ± 0.8		Woman	30	3.3 ± 0.8	
White meat egg	Male	27	3.3 ± 0.7	0.871	Male	35	3.3 ± 0.7	0.364
	Woman	29	3.3 ± 0.9		Woman	30	3.3 ± 0.9	
Processed grain whole grain	Male	32	2.8 ± 1.1	0.273	Male	35	2.8 ± 1.2	0.198
	Woman	30	2.5 ± 0.9		Woman	30	2.5 ± 0.10	
Legumes vegetables	Male	32	3.6 ± 0.7	0.013*	Male	32	3.6 ± 0.8	0.075
	Woman	30	4.1 ± 0.8		Woman	30	4.1 ± 0.9	
Fruit	Male	26	3.7 ± 0.4	0.841	Male	31	3.7 ± 0.4	0.059
	Woman	30	3.7 ± 0.7		Woman	30	3.7 ± 0.7	
Milk red and processed meat	Male	32	3.3 ± 1.7	0.15	Male	32	3.3 ± 1.8	0.679
	Woman	27	2.7 ± 1.5		Woman	29	2.7 ± 1.6	
White meat egg	Male	32	2.4 ± 0.9	0.6	Male	35	2.4± 0.10	0.042*
	Woman	31	2.6 ± 1.5		Woman	30	2.6 ± 0.10	
Processed grain Whole grain	Male	30	2.3 ± 0.7	0.164	Male	35	2.3 ± 0.8	0.009**
	Woman	30	2.6 ± 0.9		Woman	30	2.6 ± 0.10	
Legumes vegetables	Male	30	3.1 ± 0.9	0.081	Male	35	3.1 ± 0.10	0.052
	Woman	30	2.7 ± 0.9		Woman	30	2.7 ± 0.10	
Fruit	Male	30	2.6 ± 1.2	0.5	Male	35	2.6 ± 1.3	0.984
	Woman	30	2.4 ± 1.1		Woman	30	2.4 ± 1.2	

*****p<0.001, **p<0.01, *p<0.05**

(p <0.05). Especially in patients with colon cancer consumed more frequently, it was noted in our study (p <0.01). The consumption of vegetables and oilseeds was significantly more frequent in the control group (p <0.05) (Table 3).

Egg consumption was significantly higher in colon cancer patients than in men (p <0.05). In the other food groups, there was no statistically significant difference according to the gender of the patients in the patient group (p> 0.05). The consumption of legumes and vegetables in the control group was found to be significantly more frequent in females than in males (p <0.05) (Table 4).

DISCUSSION

Burkitt and Trowell described as hastalık civilization diseases "; cardiovascular diseases, digestive system diseases, obesity, diabetes and bowel diseases. Therefore, studies on the metabolic importance and health benefit of dietary fiber have been intensified (1).

Fifty percent of the patients with colon cancer were under the age and the majority of the control group was under the age of 50 with 86.2%. There was no gender difference between colon cancer patients and control group. 80% of the patients with colon cancer, 48% of the control group were married and the rate of high school education was similar in both groups.

Red meat consumption and processed meat products are known to increase the risk of colon cancer. Erman et al. (2007) reported that products such as red meat, salami and sausages increased the risk of colorectal cancer in order to investigate the risk of 50-74 years (mean age 63) 148.610 adults in 1982 and 1992-1993 between the years of the survey conducted in 1992 and 1.2 have identified colorectal cancer cases. Men consumed more red meat and processed meat than women (11).

In our study, consumption of red and processed meat was significantly more frequent in colon cancer patients than in control group (p <0.001). White meat consumption was found to be statistically more frequent in the control group compared to the patient group (p <0.05). In addition, red, processed meat consumption and white meat consumption of the patients in the patient group increased in parallel with the increase in educational status (p <0.01).

Ibrahim et al. (2007), in a study of 85.903 men and 105.108 female food consumption frequency was investigated, individuals who consume dietary fiber frequently stated that they are less overweight. At the end of the study, a significant relationship was found between dietary fiber consumption and colorectal cancer (12).

In a review by Dagfinn et al. (2011), which retrospectively analyzed twenty-five prospective studies, it was reported that especially cereal fibers reduce the risk of colorectal cancer (13).

According to Erman et al. (2007), in a study conducted in Italy; consumption of whole wheat bread was found to reduce the risk of digestive system cancers and especially upper digestive system cancers. Dietary fiber has been shown to significantly reduce the risk of colon cancer (11).

In a study by Jennifer et al. (2005), 39.876 healthy women older than 45 years were included in the study (13). After 10 years of follow-up, 0.6% of women were diagnosed with colorectal cancer. In the results, especially in the legumes of legumes with high consumption of legumes, isoflavones, protease inhibitors, phytosterols, saponins, phenolic compounds, phytic acid have potential anticarcinogenic properties, showing the antioxidant effect of cells that cause cancer and cancer cancers are reported to reduce the risk (11).

Pirjo et al. (2000), in a study of 27.111 Finnish men. Eight years of follow-up revealed dietary fiber intake and its relationship with colorectal cancer. This 8-year follow-up only accounts for 0.6% of the colorectal cases. As a result, high fiber containing vegetables, fruits and legumes have a protective effect against colorectal cancer (15).

In our study, it was observed that there is a difference in the consumption of dried beans only in legumes. Colon cancer patients consumed dried beans more frequently. ($P < 0.05$). When the study group was compared with the patient group: no statistically significant difference was found between the two groups in the consumption of other legumes products ($p > 0.05$). In addition, while the age of the participants in the study group decreased the consumption of legumes and increased in the control group ($p < 0.01$).

Excessive consumption of fresh vegetables and fruits reduces the risk of developing colorectal cancer by increasing the intake of pulp and maintaining the intestines to function regularly. Especially, edible fruits with peels are the most important factors that increase fiber intake. Studies show that small grain fruits such as currants and raisins are good sources of phytoestrogens. Although the results obtained from the studies of phytoestrogens can be protective against gastric, colon and endometrial cancers, new studies are needed because of limited data (16).

Christina et al. (2010), in their study to examine dietary fiber and colorectal cancer, a control group consisting of 1996 individuals and 579 patients with colorectal cancer food consumption questionnaire was applied. At the end of the study, consumption of fruits and vegetables with high dietary fiber content and density was inversely related to colorectal cancer. In the study of Murphy N (2012), after 11 years of follow-up, it was found that fruit and vegetable fiber was inversely related to colorectal cancer in 4.517 colorectal cancer cases (16).

Rachel et al. (2013), 27 prospective and cohort analysis of the results of the study, especially as a result of the protective effect of vegetable and fruit fibers from colon cancer, but stated that the available information is not enough (17).

In oil seeds, perhaps due to social situation, perhaps in our study has not seen enough intake in accordance with habits, but in a study conducted on tumor mice in n-3 containing oil or purified n-3 fatty acids in mice supplemented with purified n-3 fatty acids such as lung, colon, breast, prostate. cancer types have been found to slow down (Mol, 2008). In addition, it makes positive contributions to the column structure with its fiber content (18).

Mol (2008), to investigate the protective properties of dietary fiber from colon and rectal cancers 47.279 men and 76.947 women made a study. Surveys with diet purchases were renewed every four years. Sixteen years of long-term follow-up revealed that dietary fiber uptake was inversely related to colorectal cancer and other lifestyles should be considered with fiber uptake (18).

As in many diseases, it is possible to prevent colon cancer. It is known that negative lifestyle and unbalanced eating habits increase the risk of colon cancer (19). Dietary fiber changes the flora in the colon, reduces the formation of toxic metabolites, accelerates the excretion of feces, shortens the contact time of toxic metabolites with intestinal cells and prevents colon cancer (5).

It is stated that dietary fibers affect bacterial species in human metabolism and control intestinal flora and metabolism with synergistic and antogonist effects (20). Dietary fibers increase the stool volume and amount of water and have a relaxing effect, which helps prevent constipation (21).

In a study by Eheman et al. (2012) in America, the relationship between overweight and colon cancer was investigated. As a result of the thirty-three-year observation, it is stated that individuals aged 50 and over may increase the incidence of developing colorectal cancer and worsen the prognosis of the existing disease (22).

In a review in which Dagfinn et al. (2011) analyzed twenty-five prospective studies retrospectively, especially cereal fibers were reported to reduce the risk of colorectal cancer (12).

In a study by Christina et al. (2010), a food consumption questionnaire was administered to a control group of 1996 individuals and 579 colorectal cancer individuals to examine dietary fiber and colorectal cancer. In the study result, consumption of fruits and vegetables with high dietary fiber content and density is inversely associated with colorectal cancer (23).

CONCLUSIONS

Red and processed meat consumption of colon cancer patients was found to be more frequent than the control group. White meat consumption was significantly more frequent in the control group. It was determined that it was important for individuals with colon cancer to consume more frequently. The consumption of vegetable and oil seeds was significantly more frequent in the control group. It was thought that low consumption of foods with high fiber content could increase the risk of colon cancer by combining with environmental and genetic factors. Poultry meat consumption was found more frequently in the control group. Especially, individuals with leguminous colon cancer consume more frequently in our study. Vegetable and oilseed consumption of individuals in the control group was statistically significantly more frequent. In other food groups, there was no statistically significant difference between individuals in the control and patient groups. Low consumption of foods with high fiber content was thought to increase the risk of colon cancer by combining with environmental and genetic factors.

In order to prevent colon cancer during the globalization process, it is necessary to increase the awareness of nutrition in the whole society and to transform the healthy diet into lifestyle and to increase the fiber intake in connection.

The presence of sufficient fiber groups (vegetables and fruits, whole grain products, legumes etc.) in the diet will increase the consumption of dietary fiber. For breakfast, fiber rich foods can be preferred. Whole grains and products should be preferred. Legumes should be consumed 2 or 3 times a week. Fruits and vegetables should be consumed together with edible shells. Fruits that can be eaten without peeling (eg apples, pears) must be eaten without peeling. Applications can be made to increase fiber in cooking methods. For example; cooking meat dishes with vegetables, lentils in soup, prefer rice wholemeal. When purchasing nutrients, the label of the nutrients should be read about the fiber content and those with high fiber content should be preferred. The consumer should be made aware of fiber consumption through seminars and advertisements. Turkey is a country rich in dietary fiber in terms of an important agricultural resources because it has the potential. In fact, production residues of food enterprises in our country constitute the most important dietary fiber sources. The utilization of these production residues, the utilization of waste resources and the development of new products by adding different fiber sources to nutrient products will contribute to both the healthy nutrition of our society and the development of our food industry.

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CONFLICT OF INTERESTS

Authors declare no conflict of interest

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