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## ETHNIC GROUPS AND COLORECTAL CANCER. A RETROSPECTIVE STUDY IN KAZAKHSTAN

Rasim A. KERIMOV, <http://orcid.org/0000-0001-6156-0958>,  
Murat E. ZHANTEYEV, <http://orcid.org/0000-0002-5387-3476>,  
Saule B. BISSIMBAYEVA, <https://orcid.org/0000-0002-2234-3368>

South Kazakhstan Medical Academy, Shymkent, Republic of Kazakhstan



Kerimov R.A.

In 2018 compared to 2010, the incidence rate of colorectal cancer increased by 1.8 folds. In this regard, studies aimed at studying the risk factors of this disease have been actualized. In many publications, it was shown that different ethnic groups had unequal risks for colorectal cancer development.

**The purpose of this study** was to investigate the link between ethnic groups and colorectal cancer in Kazakhstan.

**Material and methods.** Patients' medical records, which were made from 2011 to 2016, were studied in 4 regional oncology centres. The group of patients with colorectal cancer and the group of patients with no malignant diseases were compared. There were 1570 cases in each group. Based on the results of the data obtained, such indicators as the chi-square test and relative risks were calculated.

**Results and discussion.** The analysis showed that in the patient group the share of Russians was higher than that in the control group and in the population. The strength of the association was estimated as moderate ( $\chi^2(2)=487.3$ ,  $p<0.001$ ). This association may be caused by many factors what requires additional research.

### Conclusions

1. The analysis showed that different ethnic groups had unequal risks for colorectal cancer development;
2. Such a difference might be due to the nature of the diet, susceptibility of the ethnic group to the disease, the level of seeking of the medical assistance, involvement in a healthy lifestyle;
3. More research is needed to clarify the association.

**Keywords:** colorectal cancer, cancer of the colon and rectum, ethnic groups, Kazakhstan.

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### Т Ұ Ж Ы Р Ы М

#### ЭТНИКАЛЫҚ ТОПТАР ЖӘНЕ КОЛОРЕКТАЛДЫ ОНЫР. ҚАЗАҚСТАНДАҒЫ РЕТРОСПЕКТИВТІ ЗЕРТТЕУ

Расим А. КЕРИМОВ, <http://orcid.org/0000-0001-6156-0958>,  
Мұрат Е. ЖАНТЕЕВ, <http://orcid.org/0000-0002-5387-3476>,  
Сәуле Б. БИССИМБАЕВА, <https://orcid.org/0000-0002-2234-3368>

Оңтүстік Қазақстан медицина академиясы, Шымкент қ.,  
Қазақстан Республикасы

2018 жылы колоректалды обыр аурушандығы 2010 жылмен салыстырғанда 1,8 есеге өсті. Осыған байланысты осы аурудың қауіпті факторларын анықтауға бағытталған зерттеулер өзектілендірілді. Бірқатар зерттеулерде әртүрлі этникалық топтардың колоректалды обыр дамуының әртүрлі тәуекелдіктері бар екендігі көрсетілген.

**Бұл зерттеудің мақсаты.** Қазақстандағы этникалық топтар мен колоректалды обыр арасындағы байланысты зерттеу болып табылады.

**Материал және әдістер.** 2011-2016 жылдар аралығында 4 облыстық онкологиялық орталықта емделушілердің ауру тарихы зерттелді. Екі топ – колоректалды обыры бар пациенттер және қатерлі ісіктермен ауырмаған пациенттер салыстырылды. Әр топ бойынша 1570 жағдай қаралды. Алынған деректердің нәтижелері бойынша хи-квадрат критерийі және салыстырмалы тәуекелдер сияқты көрсеткіштер есептелді.

**Нәтижелері және талқылауы.** Талдау пациенттер тобында орыс ұлты тұлғаларының үлесі бақылау тобына және популяциясына қарағанда жоғары болғанын көрсетті. Байланыс күші орташа деп бағаланды ( $\chi^2(2)=487.3$ ,  $p<0.001$ ). Бұл белгілер қосымша зерттеулерді талап ететін көптеген факторлармен байланысты болуы мүмкін.

### Қорытынды

1. Талдау әр түрлі этникалық топтардың колоректалды обыр дамуының әртүрлі тәуекелдері бар екенін көрсетті;
2. Мұндай айырмашылық диетаның сипатына, белгілі бір этникалық топтың ауруға бей-

**Contacts:** Rasim A Kerimov, Master of Medicine, PhD doctoral candidate, senior lecturer of the Department of Normal and Pathological Physiology of the South Kazakhstan Medical Academy, Shymkent, Al-Farabi district, pl. Al-Farabi, 1. E-mail: kir-2004@list.ru

**Контакты:** Керимов Расим Азат-оглы, магистр медицины, PhD докторант, старший преподаватель кафедры Нормальной и патологической физиологии Южно-Казахстанской медицинской академии, г. Шымкент, Аль-Фарабийский район, пл. Аль-Фараби, д.1. E-mail: kir-2004@list.ru

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**Рецензент:** Кузикеов Марат Анатольевич, доктор медицинских наук, руководитель Центра абдоминальной онкологии Казахского научно-исследовательского института онкологии и радиологии, г. Алматы.

імділігіне, медициналық көмекке жүгіну деңгейіне, салауатты өмір салтына тартылуына байланысты болуы мүмкін;

3. Анықталған байланысты анықтау үшін қосымша зерттеулер қажет.

**Негізгі сөздер:** колоректалды обыр, тоқ және тік ішек обыры, этникалық топтар, Қазақстан.

## РЕЗЮМЕ

### ЭТНИЧЕСКИЕ ГРУППЫ И КОЛОРЕКТАЛЬНЫЙ РАК. РЕТРОСПЕКТИВНОЕ ИССЛЕДОВАНИЕ В КАЗАХСТАНЕ

Расим А. КЕРИМОВ, <http://orcid.org/0000-0001-6156-0958>,

Мурат Е. ЖАНТЕЕВ, <http://orcid.org/0000-0002-5387-3476>,

Сауле Б. БИСИМБАЕВА, <https://orcid.org/0000-0002-2234-3368>

*Южно-Казахстанская медицинская академия, г. Шымкент, Республика Казахстан*

В 2018 году заболеваемость колоректальным раком выросла в 1,8 раза по сравнению с 2010 годом. В этой связи актуализировались исследования, направленные на изучение факторов риска данного заболевания. В ряде исследований показано, что разные этнические группы имеют неодинаковые риски развития колоректального рака.

**Целью данного исследования** являлось изучение связи между этническими группами и колоректальным раком в Казахстане.

**Материал и методы.** Изучались истории болезней пациентов в 4-х областных онкологических центрах с 2011 по 2016 годы. Сравнивались две группы – пациенты с колоректальным раком и пациенты, неотягощенные злокачественными новообразованиями. В каждой группе было по 1570 случаев. По результатам полученных данных были рассчитаны такие показатели, как критерий хи-квадрат и относительные риски.

**Результаты и обсуждение.** Анализ показал, что в группе пациентов доля лиц русской национальности была выше, чем в контрольной группе и популяции. Сила связи оценивалась как средняя ( $\chi^2(2)=487,3$ ,  $p<0,001$ ). Данная ассоциация может быть связана со многими факторами, что требует дополнительных исследований.

#### Выводы

1. Анализ показал, что разные этнические группы имеют неодинаковые риски развития колоректального рака;

2. Подобное различие может быть обусловлено характером диеты, восприимчивостью определенной этнической группы к заболеванию, уровнем обращаемости за медицинской помощью, вовлеченность в здоровый образ жизни;

3. Требуется дополнительные исследования для выяснения выявленной связи.

**Ключевые слова:** колоректальный рак, рак толстой и прямой кишки, этнические группы, Казахстан.

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From year to year, the incidence rate of colorectal cancer (CRR) rises as in Worldwide as in Kazakhstan. In 2018, the rate of this disease had been boosted by 1,8 folds since 2010 [1]. According to the recent statistical data, cancer of the colon and rectum is the 3rd most common malignant disease in Kazakhstan [2]. Some studies showed that different ethnic groups living in the same country might have an unequal odds ratio for CRR development. So, Nicholas J. Ollberding et al indicated that Japanese Americans and African American women had increased risk of CRR in comparison with whites. Also, it was shown that Japanese Americans of both sexes and Native Hawaiian men had increased risk for rectal cancer compared to whites [3]. Taking into consideration these facts, among the researchers from different countries, there is a growing understanding that it is necessary to conduct research at the level of different populations since each of them might have different factors causing the disease.

**The goal of this study** was to estimate associations between colorectal cancer and different ethnic groups residing in Kazakhstan.

## MATERIAL AND METHODS

In the context of this study, two groups were compared. The first (patient) group included patients with the CRR. To collect data about them, a retrospective analysis of the medical records was carried out in the South Kazakhstan, East Kazakhstan, Mangistau and Karaganda regional oncology centres. This group included the firstly revealed cases of colon and rectal cancer for 2011-2016. The second group included patients with no malignant disease. Data concerning the second group's patients were obtained from the medical records of the city outpatient clinics.

The following statistical calculations were provided in this study: chi-square test, the p-value of the chi-square test, Cramer's V (to determine the strength of association obtained from chi-square test) and relative risks (RR).

## RESULTS

The patient and control groups included 1570 cases per each of them. The average age in the first group was 61.6 years, in the second one – 58.2 years. Sexual distribution was: 55% and 56.8% of women accordingly. The diagram below shows

the ethnic distribution in the first, second groups and in the population (according to statistical official data).

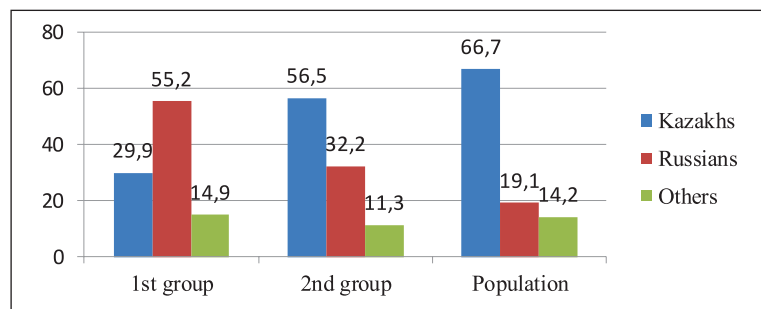


Fig. 1 – Ethnic groups in all studied regions: patients, controls and population (%)

Figure 1 shows ethnic group distributions for all regions concerned. It can be seen that Russians prevailed in the group of patients, although in the control group and in the population this ethnic group was the second most common (among patients they were 55.2%, but in the control group and in the population – 32% and 19.1% respectively). The difference between the groups by ethnic distribution was statistically significant, and the strength of the association between the studied disease and ethnicity was estimated as moderate ( $\chi^2(2) = 487.3$ ,  $p < 0.001$ ,  $V = 0.32$ ).

Table 1 shows that in respect with each studied regions the share of the Russians in the patient group was greater than that in both the control group and in the population. According to the calculation of the chi-square test, this difference was statistically significant for each regions concerned; strength of this association varied from moderate to relatively strong (for

South Kazakhstan Region:  $\chi^2(2) = 39.8$ ,  $p < 0.001$ ,  $V = 0.23$ ,  $V = 0.22$ ; for East Kazakhstan Region:  $\chi^2(2) = 275.4$ ,  $p < 0.001$ ,  $V = 0.42$ ; for Mangystau Region:  $\chi^2(2) = 17.5$ ,  $p < 0.001$ ,  $V = 0.24$ ; for Karaganda Region:  $\chi^2(2) = 194$ ,  $p < 0.001$ ,  $V = 0.31$ ).

Calculations of RR showed that  $RR = 0.56$  (95% CI: 0.52-0.61) was for Kazakhs,  $RR = 1.59$  (95% CI: 1.48-1.7) was for Russians and  $RR = 1.16$  (95% CI: 1.06-1.28) was for others.

## DISCUSSION

Analysis of medical records from different regions of Kazakhstan showed that different ethnic groups had unequal risks for colorectal cancer. This conclusion was consistent with the results of the calculation of the chi-square test. According to

the authors of this article, the results got in this study could be caused by various factors (diet, genetic susceptibility of ethnic groups to the disease, the degree of seeking for medical assistance, involvement in physical training and keeping a healthy lifestyle). The revealed patterns require additional studies like case-control study or longitudinal prospective study.

## CONCLUSIONS

1. The analysis showed that different ethnic groups had unequal risks of CRR development;
2. Such a difference might be caused by patterns of diet, susceptibility of the ethnic group to the disease, degree of seeking medical assistance, involvement in a healthy lifestyle;
3. Additional studies are required to clarify revealed associations.

Table 1 - Ethnic group's distributions for each studied region (%)

Ethnicity	1st group (patients)	2nd group (controls)
South Kazakhstan Region		
Russians	47 (18.4)	21 (8.2)
Kazakhs	146 (57)	180 (70.3)
Others	63 (24.6)	55 (21.5)
Total	256 (100)	
East Kazakhstan Region		
Russians	397 (75.3)	213 (40.4)
Kazakhs	109 (20.7)	294 (55.8)
Others	21 (4)	20 (3.8)
Total	527 (100)	
Mangystau Region		
Russians	18 (17.8)	9 (8.9)
Kazakhs	67 (66.3)	83 (82.2)
Others	16 (15.9)	9 (8.9)
Total	101 (100)	
Karaganda Region		
Russians	404 (58.9)	263 (38.3)
Kazakhs	148 (21.6)	330 (48.1)
Others	134 (19.5)	93 (13.6)
Total	686 (100)	

**Research transparency**

Research did not have a sponsorship. The authors are absolutely responsible for presenting the release script for publication.

**Declaration about financial and other relations**

The release script was approved by all authors. The authors did not get the honorary for the article.

**Authors' contributions**

Kerimov Rassim Azat-ogly - acquisition and analysis of data (records from the Regional Oncology centres), calculations, design, writing of the article text;

Zhanteyev Murat Endybayevich - acquisition and analysis of data (records from the city outpatient clinics), correction of the article text;

Bissimbayeva Saule Babatovna - critical revision of the article, checking of the calculations, writing of the article text ('Discussion').

**Conflict of interest**

The authors declare no conflict of interest.

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