

Analysis of the results obtained by national research groups with the Russian state cancer program for the screening of diseases of the oral mucosa and the vermilion border

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Abstract

Aims and Objectives: The purpose of the article is to analyze the results obtained by the national research groups with the Russian State Cancer Program for the screening of diseases of the oral mucosa and the vermilion border. This article analyzes the results obtained by national research groups in the implementation of the Russian State Cancer Program.

Background: Based on the Department of Therapeutic Dentistry of A.I. Yevdokimov Moscow State University of Medicine and Dentistry, national research groups were created to implement the state program draft for the screening of oncological and precancerous diseases of the oral mucosa and the vermilion border – a grant of the “A” format to support applied research on a competitive basis in the form of subsidies of the federal target program.

Materials and methods: From 2015 to the first half of 2019, the national clinical groups studied the epidemiology (prevalence rate and structure) of oncological and precancerous diseases of the oral mucosa and the vermilion border in 486,059 persons aged 18-92 years living in Tula, the Tula region, Moscow and Noyabrsk as a result of active pathology detection during targeted examination of the population (screening) and appealability in the preclinical period, early, timely and late detection.

Results: the results of the research confirm low cancer alertness of practicing dentists. An individual patient registration card has been developed to systematize data and create a diagnostic register for the screening of cancer and precancerous diseases of the oral mucosa and the vermilion border.

Conclusion: A project has been developed to implement the Russian State Cancer Program for oncological and precancerous diseases of the oral mucosa among the population of the Russian Federation.

Keywords: Cancer screening, national program, oral mucosa, precancer

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Submitted: 06-Jul-2020, **Revised:** 26-Jul-2020, **Accepted:** 06-Aug-2020, **Published:** 09-Jan-2021

INTRODUCTION

In the world, cancer of the oral mucosa accounts for 40% of oncologic diseases of the head and neck, which

determines its second place after cancer of the larynx.^[1] The detection of the disease at early stages is characteristic of about 36%–45% of cases.^[2-7] Low detection rates of cancer of the oral mucosa are inconsistent with the fact

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How to cite this article: Maksimovskaya LN, Abramova MY, Erk AA. Analysis of the results obtained by national research groups with the Russian state cancer program for the screening of diseases of the oral mucosa and the vermilion border. *J Oral Maxillofac Pathol* 2020;24:582-3.

Access this article online

Quick Response Code:



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www.jomfp.in

DOI:

10.4103/jomfp.JOMFP_289_20

that in 84% of cases, it is preceded by precancerous diseases of the oral mucosa and the vermillion border. Moreover, the 5-year survival rate at the T2N0M0 stage is <60% and when regional metastases are detected, it decreases by the factor of two.^[8,9] In Russia, from 3378 to 11,000 new cases of cancer of the oral mucosa are registered annually.^[8,10] Over the past decade, the mortality rate in the 1st year from diagnosis has remained unchanged at about 45%.^[10] The overall 5-year survival rate does not exceed 50% with induction chemotherapy and 70.4% – with combined treatment and surgery at the first stage of therapy of the oral mucosa cancer at the T2N0M0 stage. This allows recognizing this treatment method as the most optimal for this pathology.^[6,11-17] The most widespread diseases are cancer of the tongue (from 62.4% to 75% of patients), the oral floor (14.3%) and other parts of the oral cavity (37.4%).^[8,10] The most common form of cancer of the oral mucosa, which accounts for 95% of all malignant tumors of this location, is squamous cell carcinoma, which is based on the accumulation of heterogeneous genetic changes in squamous epithelium and their increased ability to proliferate invasion and malignancy.^[12,13]

The main method for detecting oncological and precancerous diseases of the oral mucosa and the vermillion border is the clinical method.^[18-23] Special methods include simple and expanded stomatoscopy,^[23,24] the ViziLite chemiluminescent diagnostic method^[7,25,26] using disposable flashlights and reagents, as well as the method for determining salivary tumor markers.^[27] The implementation of the Russian National Cancer Program is based on two methods for early detection of neoplasms – early diagnostics and screening, recommended by the World Health Organization. These methods are financed by federal target allocations (government tasks).

The purpose of the article is to analyze the results obtained by the national research groups with the Russian State Cancer Program for the screening of diseases of the oral mucosa and the vermillion border.

MATERIALS AND METHODS

Based on the Department of Therapeutic Dentistry of A. I. Yevdokimov Moscow State University of Medicine and Dentistry, national research groups were created to implement the state program draft for the screening of oncological and precancerous diseases of the oral mucosa and the vermillion border – a grant of the “A” format to

support applied research on a competitive basis in the form of subsidies of the federal target program. From 2015 to the first half of 2019, the national clinical groups studied the epidemiology (prevalence rate and structure) of oncological and precancerous diseases of the oral mucosa and the vermillion border in 486,059 persons aged 18–92 years living in Tula, the Tula region, Moscow and Noyabrsk as a result of active pathology detection during a targeted examination of the population (screening) and appealability in the preclinical period, early, timely and late detection. Moreover, screening was carried out on an ongoing basis as a part of annual examinations of those who first applied for dental care to the bases of the creation of the national clinical groups, as well as one-off examinations for employees of the Paris Commune enterprise and patients of the Center for Gerontology of the Pension for Labor Veterans No. 1 of the Moscow Department of Labor and Social Protection of Population. Clinical checkup and examination using autofluorescence stomatoscopy with a LED AFS device (medical device registration certificate No. FSR 2011/10669 dated October 5, 2017), developed jointly by A. I. Yevdokimov Moscow State University of Medicine and Dentistry and Prokhorov General Physics Institute of the Russian Academy of Sciences.

RESULTS

The first national research group was created in Tula and the Tula region; in 2015 and 2016, it examined 76,940 persons in Tula. Then, from 2017 to the first half of 2019, three groups screened oncological and precancerous diseases of the oral mucosa and the vermillion border in 409,119 persons aged 18–92 years. Among them, 221,069 persons lived in Tula, 184,504 in the Tula region, 3245 in Moscow and 301 – in Noyabrsk (Yamalo-Nenets Autonomous Okrug). Of two existing main ways, 570 persons in Moscow were admitted for diagnosis and treatment after the onset of symptoms of the oral mucosa diseases. The rest (residents of Tula, the Tula region and Noyabrsk, 2562 patients of the Department of Therapeutic Dentistry of the Dental Clinical Center of A. I. Yevdokimov Moscow State University of Medicine and Dentistry, 67 employees of the Paris Commune enterprise and 46 patients of the Center for Gerontology of the Pension for Labor Veterans No. 1 of the Moscow Department of Labor and Social Protection of Population) were examined using the active detection method – screening. Table 1 shows the prevalence and structure of oral mucosa diseases detected using screening in 2017 – first half of 2019, according to which, 7.25% of the examined patients in Tula, 4.13% in the Tula region, 18.61% in Moscow

and 8.31% in Noyabrsk had oral mucosal diseases. We identified four groups of diseases of the oral mucosa and the vermillion border. Chronic trauma, leukoplakia, erythroplakia, lupus erythematosus (erosive-ulcerative form), flat lichen (erosive-ulcerative and hyperkeratotic form), warty (nodular) precancer, limited precancerous hyperkeratosis and abrasive (precancerous) Manganotti cheilitis were classified as precancers.

The significant difference in the revealed diseases of the oral mucosa revealed by two research groups in Tula, the Tula region and Moscow is explained by different ways of detection: appealability and screening. In 2017 – first half of 2019, 854 persons were sent to oncologic dispensaries, 168 of them, as a result of histological and immunohistochemical analyses, were diagnosed with malignant neoplasms (C1–C7, C9 and C10 according to ICD-10): lesion of the tongue beyond one and more location, side surface, floor, back of the tongue or dorsum of tongue, frontal 2/3 of the tongue, hard and soft palate, oral floor beyond one location, front and side oral floor, vermillion border of the lower lip, gums of the upper and lower jaw, mucosa, cheek skin, salivary gland, oropharynx and fossa tonsillaris. Most often, the process was localized in the tongue (43.3%) and the oral floor (20%). In other locations, the process was accounted for 36.7%. The stages of the detected malignant neoplasms are presented in Table 2.

Among benign neoplasms, hemangiomas were most often detected (215 cases, 51% of benign neoplasms). Epulises, fibromas and papillomas were revealed equally often. The most widespread location was not discovered.

Verrucous and erosive-ulcerative leukoplakia (214 cases, 38.01% of detected precancerous diseases) and lichen planus (erosive-ulcerative, including as a part of Grinspan–Villapol Syndrome, and hyperkeratotic form) (124 cases, 22.02% of detected precancerous diseases) prevailed among precancers.

Considering that one of the problems of early detection of oncological and precancerous diseases of the oral

mucosa and the vermillion border is the inattentive dental examination, an analysis of the results of the checkup of the employees of the Paris Commune enterprise was carried out according to questionnaires that registered their visits to dentists of public and private health-care organizations from 1 to 4 weeks before active detection. Among 67 examined patients, 54 persons (80.6%) had pathological elements, of which only five persons (7.81%) had been informed at previous visits before screening [Table 3]. For the first time, nine persons (13.43%) were diagnosed with tongue diseases, one (1.49%) was sent to laboratory tests because of chronic candidiasis and one (1.49%) because of a blood disease. All patients with precancerous diseases and benign neoplasms were admitted to dispensary: 537 persons – in health-care organizations of Tula, 324 – the Tula region, 281 – Moscow and 10 – Noyabrsk.

DISCUSSION

The goal of the work has been achieved – the results of the activities of national research groups under the Russian State Cancer Program for screening of oncological diseases of the oral mucosa and vermillion border have been analyzed.

The results of the studies have confirmed the opinions of Davydov and Aksel Ye;^[2] Pozdnyakova and Smirnova Yu;^[3] Paches *et al.*;^[5] Polyakov *et al.*^[6] and Gelfand *et al.*,^[10,11] testifying to the extremely low oncological alertness of practicing dentists, which leads to ignoring the initial stage of malignancy of pathological elements, accompanied by painless seals, cracks and erosion. It is proved that one of the problems of early detection of cancer and precancerous diseases of the oral mucosa and the vermillion border is the inattentive attitude of dentists to the patient's examination. Thus, 80.60% of the patients with primary and secondary elements of damage to oral mucous membrane visited dentists' offices of state or private medical organizations 1 to 4 weeks before active case detection, but that time, pathological elements were not determined. The authors' studies have confirmed the effectiveness of using two techniques for the early detection of neoplasms – early diagnosis and screening, recommended by the World Health Organization based on clinical examination and research using autofluorescence

Table 1: The prevalence and structure of diseases detected using screening in 2017 – first half of 2019

Diseases of the oral mucosa	Tula		Tula region		Moscow		Noyabrsk	
	Absolute value	Percentage	Absolute value	Percentage	Absolute value	Percentage	Absolute value	Percentage
Precancerous diseases	230	1.44	89	1.18	234	38.74	10	40.00
Benign neoplasms	66	0.41	128	1.68	47	7.79	-	-
Malignant neoplasms	84	0.52	49	0.64	35	5.79	-	-
Other	15,643	97.63	7,359	96.50	288	47.68	15	60.00
Total	16,023	100	7,625	100	604	100	25	100

Table 2: The detection of malignant diseases of the oral mucosa in terms of the stage of development

Process stage	Tula		Tula region		Moscow	
	Absolute value	Percentage	Abs.	Percentage	Abs.	Percentage
1-2	49	58.33	21	42.86	5	14.29
3	22	26.19	15	30.61	28	80.00
4	13	15.48	13	26.53	2	5.71
Total	84	100	49	100	35	100

Table 3: The structure of pathological elements in the employees of the Paris commune enterprise detected using screening

Pathological element	Prevalence. abs.	Prevalence (%)
Erosion	9	16.67
Hyperkeratinization	24	44.44
Vesicle	1	1.85
Crusting	1	1.85
Papilloma	5	9.27
Cicatrix	5	9.27
Dot	1	1.85
Scaly patches	2	3.70
Lichenification	2	3.70
Pigmentation	1	1.85
Hemangioma	2	3.70
Fissure	1	1.85
Total	54	100%

stomatoscopy.^[18-20,22,23] As a result of oncoscreening of 854 people with precancerous diseases and suspected cancer of the oral mucous membrane and vermillion border, referred to an oncologist, 168 patients were diagnosed with malignant neoplasms (C1–C7, C9 and C10, according to ICD-10): lesion of the tongue beyond one and more location, side surface, floor, dorsum, frontal 2/3 of the tongue, hard and soft palate, oral floor beyond one location, front and side oral floor, vermillion border of the lower lip, gums of the upper and lower jaw, mucosa, cheek skin, salivary gland, oropharynx and fossa tonsillar. Most often, the process was localized in the tongue (43.3%) and the oral floor (20%), which was consistent with the works of Gelfand *et al.*, 2016 and Omanova *et al.*, 2017. In other locations, the process was accounted in 36.7%. The use of early diagnosis and screening provided the identification of patients with a Stage 1–2 of the process in 42.86%–58.33% of cases, Stage 3 in 26.19–30.62% of cases and Stage 4 in 26.53%–15.48% of cases, which was significantly different from detection by reversibility, in which Stage 1–2 was registered only in 42.86% of cases and Stage 3 in 85.71% of cases.

Screening conducted by national research groups during the first half of 2017 showed that patients had cancer in 7.25% of cases from the total number of cases of oral mucosa diseases in the city of Tula, in 4.13% of cases in the Tula region, in 18.61% of cases in Moscow and in 8.31% of cases in Noyabrsk.

During the study period, the productivity of the research group from Tula grew by the factor of 18.92, and screening coverage reached 482,513 people (298,009 in Tula and 184,504 in the Tula region). This proves the need to create national research groups to coordinate and conduct comparative studies with the aim of testing the innovative screening method and early detection of cancer and precancerous diseases of the oral mucosa. This is also evidenced by the dynamics of the frequency of detection of malignant neoplasms of the oral mucosa by stages and by the number of people registered in the dispensary.

An individual patient registration card has been developed to systematize the obtained data and create diagnostic registry for screening oncological and precancerous diseases of the oral mucosa and vermillion border in the Russian Federation.

The register has been created and the application for state registration of the database “Database of patients with precancerous and oncological diseases of the oral mucosa and vermillion border” has been submitted.

The results of the work can be applied only in those conditions that were taken into account when conducting the study.

CONCLUSION

A project has been developed to implement the Russian State Cancer Program for oncological and precancerous diseases of the oral mucosa among the population of the Russian Federation. It includes the creation of national research groups, which, using the clinical and screening methods, as well as the primary detection method, determine the prevalence and structure of oral mucosal diseases and guide patients depending on the diagnosis and their medical examination.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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