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Changes in smoking prevalence and intensity in middle-aged men over 5- and 15-year follow up

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Objective. *To assess changes in the prevalence and intensity of smoking in Tyumen men aged 35–44 and 45–54 years over 5- and 15-year follow up.*

Materials and methods. *This is a cross-sectional epidemiologic study of representative cohorts of men aged 35–44 and 45–54 years with follow-up in 1995, 2000, 2010. Prevalence and intensity of tobacco smoking were assessed using WHO questionnaires as a part of cardiological screening in regular smokers.*

Results. *Based on the 5-year follow-up of Tyumen population, higher prevalence of irregular smoking and lower percentage of adults who have never smoked were identified in individuals over 40 years of age; 15-year follow-up has shown the reduction of everyday smoking and increase in smoking cessation frequency in adult men aged 35–44 and 45–54 years. Over 5 years, more everyday smokers aged 45–54 years started smoking more heavily; percentage of individuals who smoked less than 10 cigarettes per day has decreased, respectively. Over 15 years, smoking intensity in both age groups hasn't changed.*

Conclusion. *Follow-up has shown the reduction of smoking prevalence in adult active men over 15 years and the increase of smoking prevalence over 5 years. Follow-up was performed in the period of social and economic difficulties in Russia. Combined approach to behavioral and psychosocial risk factors is required for efficient smoking prevention programs.*

Keywords: *epidemiologic study, population monitoring, open population, men, smoking prevalence, smoking intensity.*

Conflict of Interest: None declared.

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Introduction

Tobacco smoking is one of the leading independent risk factors (RF) of cardiovascular (CV) morbidity and mortality. Although main effects of tobacco are well known, smoking remains the most common RF of coronary artery disease (CAD) in men [1]. Maslennikova et al. investigated how smoking contributed to mortality rates in Russia. Based on their results, 30% of all male deaths are associated with smoking (25% in Europe) and the rate of cardiovascular mortality due to smoking is the highest of all countries of European region [2]. Russia has significantly larger smoking population compared with developed countries, although 20-year follow-up has shown the reduction of smoking prevalence but increase in intensity [3]. According to epidemiologic study of cardiovascular disease and its risk factors in the Russian Federation, smoking rate among men aged 25–64 years was 43.5% [4]. The largest smoking populations were identified in Ural, Siberia and Far East, the smallest — in the Russian southern regions [3, 5, 6]. In 2003 Russia became a Party to the WHO Framework Convention on Tobacco Control and started to implement the framework and tobacco control policy. This included increasing prices and other measures, such as tobacco smoke protection, control of ingredients, packaging, labelling and advertising [7]. At the same time, international experience has shown that integrated educational and legislative measures are necessary to reduce smoking rates in Russia [8].

Smoking prevalence and intensity in Western Siberia still aren't well studied. At the same time, it's crucial to explore real effects of measures that are imposed by the government in order to prevent cardiovascular diseases and other chronic non-communicable diseases in regions with large smoking populations such as Western Siberia [3].

The objective of this study is to assess changes in the prevalence and intensity of smoking in Tyumen men aged 35–44 and 45–54 years over 5- and 15-year follow up.

Materials and methods

This is a cross-sectional epidemiologic study of representative cohorts of men aged 35–44 and 45–54 years with follow-up in 1995, 2000, 2010. Participants were randomly chosen from Tyumen Central District voters lists — 250 people for each age group were selected.

Prevalence and intensity of tobacco smoking was assessed using WHO questionnaires as a part of cardiovascular screening in regular smokers. Regular smokers,

or everyday smokers, were adults who admitted to smoking at least one cigarette (or equivalent) per day. There were also participants who have never smoked, quit smoking and those who smoked just occasionally. Everyday smokers were divided into the subgroups depending on the intensity of smoking: 1–9 cigarettes per day, 10–19 cigarettes per day and 20+ cigarettes (heavy smokers).

The study was carried out in accordance with Declaration of Helsinki. Study protocol had been approved by the local hospital ethical committee. All subjects signed an informed consent statement before participating in this study.

Statistical analysis was performed using IBM SPSS Statistics 21.0. Pearson's chi-squared test was used to compare the groups. $P < 0.05$ was considered statistically significant. Bonferroni correction was used to counteract the problem of multiple comparisons.

Results

Changes in the prevalence and intensity of smoking in Tyumen men aged 35–44 and 45–54 years are presented in the following figures.

Prevalence and intensity of tobacco use in everyday smokers aged 35–44 and 45–54 years haven't changed significantly over the study period. Higher prevalence of irregular smoking and lower percentage of adults who have never smoked were identified in individuals aged 45–54 years (7.3–21.5%, $p < 0.001$ and 44.3–21.5%, $p < 0.001$, respectively) (Fig. 1).

15-year follow-up has shown the reduction of everyday smoking and increase in smoking cessation frequency in adult men aged 35–44 and 45–54 years — 65.5–36.0% and 46.3–35.1%, respectively. The first screening has shown that more men aged 35–44 years were everyday smokers, but at 15-year follow-up everyday smoking was highly prevalent in both age groups.

As for occasional smoking, over 15 years its prevalence and intensity hasn't changed in both age groups — 9.3–10.5% in 35–44 age group and 7.3–12.1% in 45–54 age group ($p > 0.05$). Only 2.0% participants aged 45–54 quit smoking according to the results of the first screening; in the younger age group no one stopped smoking. The second screening showed that 23.7% participants aged 35–44 years and 20.3% participants aged 45–54 years, $p < 0.001$, quit smoking. Over 15 years, there were no statistically significant differences in the number of individuals who have never smoked (Fig. 2).

The baseline data show that the percentage of people who smoke very few cigarettes per day was

minimal. Percentage of moderate smokers (10–19 cigarettes per day) and heavy smokers (20+ cigarettes per day) in Tyumen population was, on the contrary, very high.

Among young men who smoked every day no changes in smoking intensity were noted; among the older men we have identified significant reduction of percentage of individuals smoking just a few cigarettes (1–9 per day) — from 16.8% to 5.0%, $p < 0.05$ and increase in the percentage of heavy smokers — from 36.8% to 62.2%, $p < 0.05$ (Fig. 3).

15-year follow-up has shown that main tendencies have returned to baseline. The third cardiologic screening in men aged 35–44 and 45–54 years has shown that the percentage of light smokers was still minimal, and the percentage of moderate smokers has increased. Heavy smoking was more prevalent in men aged 35–44 years; in men aged 45–54 years, the percentages of moderate and heavy smokers were almost the same (Fig. 4).

Discussion

According to WHO, by 2030 the number of deaths associated with tobacco smoking will rise from 6 to 8 million cases and around 80% of all deaths occur in developing countries [1]. Treatment of diseases caused by smoking and loss of productivity in smokers will cause significant economic losses. At the same time, data from the 1980–2012 study have shown the reduction of smoking prevalence in men from 41.2% to 31.1% [9]. The results from our study were similar to that data. Moreover, the tendencies that we've identified are also supported by the data from the larger studies on Russian population carried out at the same time. These studies have shown that smoking prevalence decreased from 59.8% to 39.0% [3]. Authors explain these results by the measures implemented by the Russian government [7].

In the current study we have shown the decrease in everyday smoking prevalence and increase in those who stopped smoking among middle-aged men. Percentage of those who quit smoking according to the first screening during the "perestoyka" period in Russia was extremely low, and close to zero among younger people. Although the number of people who quit smoking hasn't changed over the 5 years of follow-up, during the reform period we could clearly see the effects of the federal preventive measures. Apparently, social factors that we've identified during our study have also

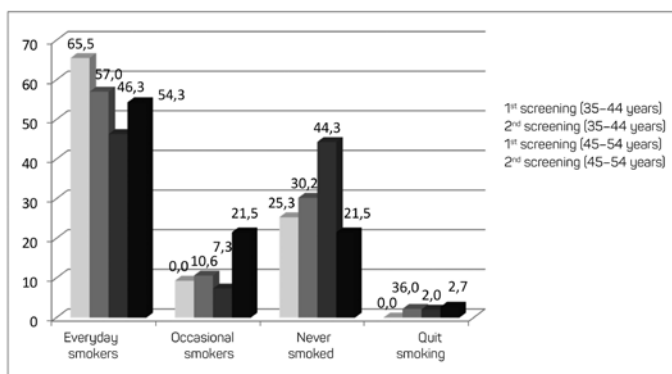


Figure 1. Changes in tobacco smoking prevalence in middle-aged men over 5 years

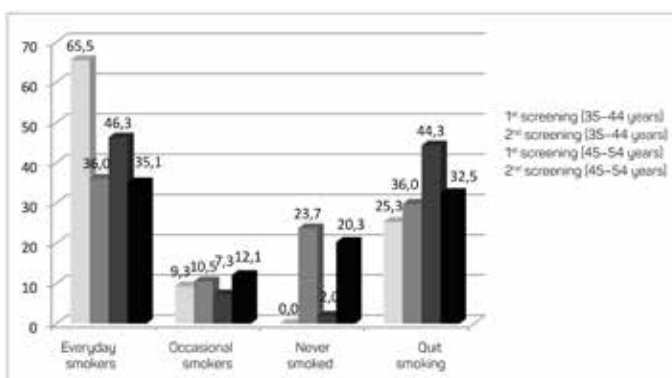


Figure 2. Changes in tobacco smoking prevalence in middle-aged men over 15 years

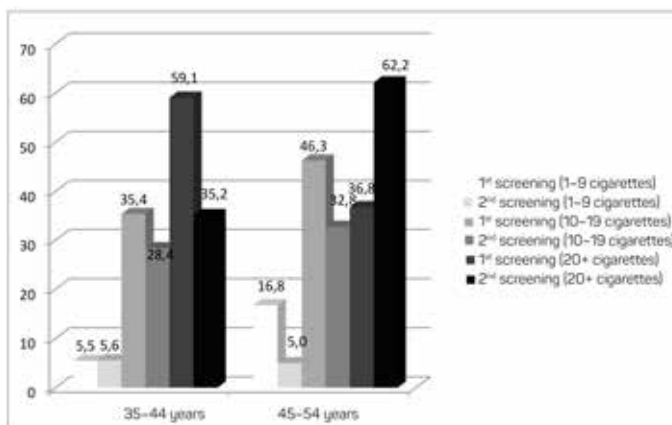


Figure 3. Changes in tobacco smoking intensity in middle-aged men over 5 years

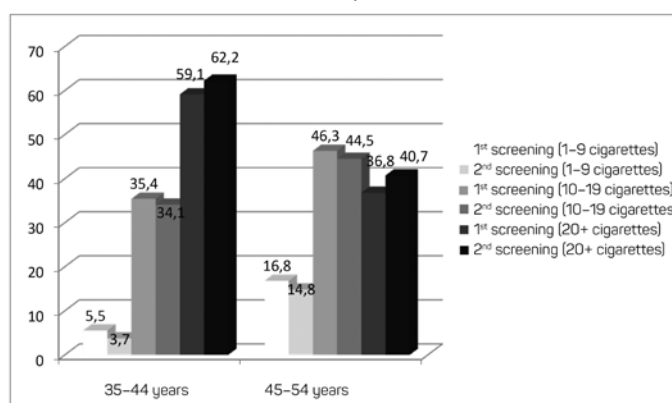


Figure 4. Changes in tobacco smoking intensity in middle-aged men over 15 years

affected Tyumen population apart from general federal measures. Social status, family stress and other chronic stress factors were less prominent and that had a positive effect on smoking prevalence in men of working age [10, 11].

Other epidemiological studies showed the reduction in the percentage of smoking men and increase in smoking intensity in the fifth decade of life. In Tyumen population, intensity of smoking was extremely high in younger people (aged 35–44 years) and decreased to 45–54 years [12]. These results are consistent with the data from our previous studies of male population in Northern Tyumen [5]. We also noted redistribution in the "everyday smokers" — "occasional smokers" — "ex-smokers" — "non-smokers" groups over 5 years of 45–54-year-old males population monitoring. At the same time, in 45–54-year-old men, together with the decrease of occasional smokers percentage we ob-

served the rise in heavy smoking prevalence. These negative changes in smoking intensity over 5 years are undoubtedly the result of massive tobacco advertising in 1996–2001 and the lack of anti-smoking propaganda.

All in all, combined approach to conventional and unconventional risk factors is necessary for creation of the most efficient prevention programs.

Conclusion

Follow-up has shown the reduction of smoking prevalence in adult active men over 15 years and the increase of smoking prevalence over 5 years. Follow-up was performed in the period of social and economic difficulties in Russia. Combined approach to behavioral and psychosocial risk factors is required for efficient smoking prevention programs.

Conflict of interest: None declared.

References

1. WHO report on the global tobacco epidemic, 2013: enforcing bans on tobacco advertising, promotion and sponsorship. Geneva: World Health Organization.
2. http://www.who.int/tobacco/mpower/2013/Appendix_VIII-table_1.pdf/
3. Maslennikova G.Ia., Oganov R.G. Medical and socioeconomic damage caused by smoking in the Russian Federation: diseases of circulatory system. *Prevention Medicine*. 2011; 3:19–27. Russian
4. Balanova Yu.A., Shal'nova S.A., Deev A.D., et al. Smoking prevalence in Russia. What has changed over 20 years? *Prevention Medicine*. 2015;6:47–52. Russian
5. Muromtseva G.A., Kontsevaya A.V., Konstantinov V.V., et al. The prevalence of non-infectious diseases risk factors in Russian population in 2012–2013 years. the results of ECVD-RF. *Cardiovascular Therapy and Prevention*. 2014;13(6): 4–11. Russian
6. Gafarov V.V., Akimova E.V. Prevalence of major risk factors for coronary heart disease in men employed expeditionary form of shift work on oil production complex of Western Siberia. *Terapevticheskiy arkhiv*. 1995;67(1); 22–25. Russian
7. Akimova E.V., Smaznov V. Iu., Kaiumova M.M., Kuznetsov V.A. Smoking, a risk of cardiovascular death in a male cohort, and a social gradient. *Prevention Medicine*. 2007;10(3): 23–28. Russian
8. Gambaryan M.G., Boytsov S.A. Progress of monitoring the execution of Federal Law No. 15-FZ "On the protection of citizens' health from exposure to second-hand tobacco smoke and consequences of tobacco consumption" in the subjects of the Russian Federation. *Prevention Medicine*. 2015;5:15–28. Russian
9. Giovino G., Mirza S., Samet J., et al. For The GATS Collaborative Group Tobacco use in 3 billion individuals from 16 countries: an analysis of nationally representative cross-sectional household surveys. *Lancet*. 2012;380(9842): 668–679.
10. Ng M., Freeman M.K., Fleming T.D. Smoking Prevalence and Cigarette Consumption in 187 Countries, 1980–2012. *JAMA*. 2014;311(2): 183–192.
11. Akimov A.M. Attitudes to smoking in open population depending on education and character of labor. *The Siberian Medical Journal*. 2014;29(3): 122–125. Russian
12. Akimov A.M., Gakova E.I., Kayumova M.M., et al. Stress in the family of young people in the gender aspect. *Vrach*. 2019;30(12): 60–62. Russian
13. Mamedov M.N. Dynamics of risk factors and cardiovascular diseases: analytical review of international and Russian data for 2017. *International Heart and Vascular Disease Journal*. 2018;6(19): 32–37. Russian
14. Wu F., Guo Y., Chatterji S., et al. Common risk factors for chronic non-communicable diseases among older adults in China, Ghana, Mexico, India, Russia and South Africa: the study on global AGEing and adult health (SAGE) wave 1. *BMJ Public Health*. 2015;15:88.
15. Amlaev K.R. Tobacco: epidemiology, clinic, treatment, prevention and normative regulation. *Medical News of North Caucasus*. 2018;13(2): 426–430 Russian
16. Akimova E.V., Akimov A.M., Gakova E.V. et al. Behavioral risk factors for cardiovascular diseases in men having different work patterns: Results of a cross-sectional epidemiological study. *Prevention Medicine*. 2016;3:49–53. Russian