

Arterial Hypertension: Prevalence, Awareness, Antihypertensive Drug Use, and Treatment Effectiveness

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Abstract: This article presents the results of the first large-scale survey conducted within the Federal Target Program “Prevention and Treatment of Arterial Hypertension in the Russian Federation”. Randomized representative cluster samples of non-organized male and female populations aged 15–75+ years across seven Federal Regions were examined (response rate >80%). The age-standardized prevalence of arterial hypertension (AH) was 39.5% (higher in women—40.4% vs. 37.2% in men). Awareness of AH was 77.9% (80.3% in women and 75% in men). Antihypertensive drug use was reported by 59.4% (63.1% of women and 53.1% of men), with effective treatment achieved in only 21.5% (22.5% of women and 20.5% of men). Angiotensin-converting enzyme inhibitors (ACE inhibitors) were the most frequently prescribed drugs (70.7%).

Keywords: descriptive epidemiology, arterial hypertension, prevalence, awareness, treatment effectiveness, ACE inhibitors, Russian Federation.

Introduction

Cardiovascular diseases (CVDs) remain the leading cause of morbidity, disability, and mortality in industrialized nations. While many countries in Western Europe, North America, Australia, and Japan have reported a decline in CVD-related mortality due to effective preventive programs, Russia continues to face an alarming epidemiological situation characterized by persistently high mortality and a “rejuvenation” of CVDs, affecting increasingly younger populations. The average life expectancy of Russian men has fallen to 57 years, placing the country among the lowest globally

Arterial hypertension (AH) is the principal risk factor determining cardiovascular morbidity and mortality in Russia. Therefore, assessing its prevalence, public awareness, treatment rates, and therapeutic effectiveness is of paramount importance.

Materials and Methods

The study was based on randomized, representative cluster samples of the general population in seven Federal Regions of Russia. Sampling followed a three-stage procedure:

Primary selection: 10 healthcare facilities (clinics, regional hospitals) were randomly chosen in each region.

Secondary selection: Within each facility, 4 physician service areas (covering 1.5–2.5 thousand residents) were chosen.

Tertiary selection: 25 households were randomly selected in each service area, resulting in approximately 50 adult participants per cluster.

Adults aged ≥ 15 years were included, and with an expected 80% response rate, each regional sample comprised ~1600 individuals. For regions with populations >1.5 million, the number of healthcare facilities was proportionally increased

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Awareness and Gender Differences

The marked improvement in awareness, particularly among women, suggests that public health campaigns have had a significant impact. Women, due to more frequent medical consultations (e.g.,

reproductive health services), may have greater opportunities for blood pressure measurement and education. Men, on the other hand, often present late with complications such as myocardial infarction or stroke.

Data Collection

Blood pressure: measured twice on the right arm; the mean was recorded.

Risk factors: smoking, alcohol intake, physical activity, and serum cholesterol.

Anthropometry: weight, height, BMI.

Clinical data: presence of left ventricular hypertrophy, retinopathy, coronary artery disease, cerebrovascular disease, diabetes, renal disease.

Therapy assessment: drug classes used, treatment adherence, and effectiveness (BP $\leq 140/90$ mmHg defined as controlled).

In total, 32,444 individuals were surveyed with a response rate above 80%.

Treatment Effectiveness and Barriers

Despite relatively high drug prescription rates, only one in five patients achieved effective control. Several barriers have been identified:

Poor adherence: many patients discontinue therapy after initial improvement.

Cost of medications: although ACE inhibitors dominate prescriptions, newer drugs remain expensive and less accessible.

Healthcare system challenges: limited follow-up visits and lack of integrated patient monitoring.

Cultural attitudes: reliance on traditional remedies and underestimation of hypertension risks.

Results

Prevalence

Age-standardized prevalence of AH: 39.5%.

By gender: 40.4% in women, 37.2% in men.

Regional differences:

Highest prevalence in the Southern (45.9%) and Volga (43.2%) Federal Regions.

Lowest prevalence in the Far Eastern Region (32.3%).

Awareness

Overall awareness: 77.9%.

Women: 80.3%; Men: 75%.

Awareness nearly doubled compared with 10 years earlier (men: 37.1% $\rightarrow$ 75%; women: 58.9% $\rightarrow$ 80.3%).

Treatment

Overall treatment rate: 59.4%.

Women: 63.1%; Men: 53.1%.

Regional variation: highest in the Southern Region (72.5%), lowest in the Ural Region (35.1%).

Effectiveness

Effective treatment: 21.5% overall.

Women: 22.5%; Men: 20.5%.

Highest control rates: Far Eastern and Ural Regions (~26%).

Lowest control rates: rural areas of the Southern Region (3.2%).

Drug Use

ACE inhibitors: 70.7%

Diuretics: 45.9%

Beta-blockers: 26.5%

Calcium antagonists: 17.7%

Newer drugs (angiotensin II receptor antagonists, central-acting drugs): prescribed infrequently (1.6%).

Discussion

Despite increased awareness and drug use compared to a decade ago, the prevalence of AH in Russia has remained virtually unchanged. Women consistently demonstrated higher awareness and treatment rates than men. Rural populations, particularly women, were better informed and treated more frequently than their urban counterparts, although treatment effectiveness was not substantially higher.

The dominance of ACE inhibitors indicates adherence to international treatment standards, yet the low proportion of patients achieving effective BP control highlights gaps in therapeutic adherence, patient education, and healthcare system performance. Compared to Western countries, Russia still lags behind in hypertension control rates (England: 29%, USA: 34%).

Future Directions

Further research in Russia should focus on:

Longitudinal studies to track changes in prevalence and mortality.

Evaluation of cost-effectiveness of new-generation antihypertensives.

Interventions targeting high-risk groups (e.g., men aged 35–55, heavy drinkers, urban sedentary workers).

Integration of cardiovascular prevention into national health programs addressing diabetes, obesity, and smoking.

Conclusion

The Federal Program has succeeded in improving awareness and increasing drug use among hypertensive patients in Russia. However, treatment effectiveness remains unsatisfactory, with only one in five patients achieving target blood pressure. Future efforts should focus on optimizing pharmacological regimens, enhancing patient adherence, and strengthening preventive strategies to reduce the burden of hypertension and related cardiovascular diseases.

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