



## Epidemiology of Arterial Hypertension in the Adjarian Region of Georgia

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### Resume

The purpose of the study is to reveal the dynamics of prevalence of arterial hypertension, its risk factors and complications. An epidemiological study of the disorganized population in the Adjarian region of Georgia was carried out. The random sampling is the cluster one. The sample size – 900 families – 900 persons. The entire studied contingent was invited to a repeated survey, five years later. In connection with high migration and mortality within the period, the response was 24,7%. The survey included the filling out of the epidemiological questionnaire, three-fold measurement of BP in the sitting position, anthropometry, the Kettle index calculation.

In the initial survey, the arterial hypertension prevalence constitutes 26,9% in the population, and 49,8% in the dynamics. The location altitude showed no practical effect on the arterial hypertension development. Such risk factors as hypodynamia, excessive use of alcohol were associated with the prevalence of hypertension.

The priority risk factors were found to be the psycho-social stresses (58%), the excessive use of dietary salt (56%).

A high level of behavioral risk factors deserves attention in characterizing the non-response contingent.

The prevalence of the psycho-social risk factors and the poor state of the arterial hypertension control system in the country should be mentioned upon interpreting the worsened epidemiological situation.

*Key words:* arterial hypertension, epidemiological survey, risk factors, epidemiological situation

Arterial hypertension (AH) is one of the risk factors of cardiovascular diseases (CVD) that defines the structure of morbidity and mortality in population. It is considered to be the main risk factor of ischemic heart disease (IHD), myocardial infarction, stroke [1].

In Georgia the CVD mortality has a leading position in the structure of the general morbidity. In our country this index had increased by 66,4% from 1970 to 1992.

The epidemic of cardio-vascular diseases in post-socialistic countries is associated with the high prevalence of three classical risk factors (hypercholesterolemia, smoking and AH). These risk factors are facilitated by such factors as psychosocial stress, social problems and others [2].

It is widely known, that AH, psychosocial stress, dietary habits, obesity determine the dynamics of epidemiological situation [3]. That is why a special importance has a condition of the AH control system in population. It was shown, that the rule of Weiber and Barrow (rule of halves) is still actual in the developing countries in terms of AH control [4]. The half of hypertensive patients is treated, but only the half of them achieves a target blood pressure levels. One of the reasons of small efficacy of antihypertensive therapy is an insufficient compliance of the patients.

The epidemiological studies in the different regions of Georgia are carried out in the frames of the state program "Prevention of the cardiovascular diseases" in order to study the prevalence of AH in the representative groups of population.

In collaboration with CDC-ATLANTA (The center of disease control and prevention, USA) the epidemiological

study in the western Georgia (Adjaria, 1996, the population is 250,000) was held in order to investigate the epidemiological situation with AH and its risk factors. The bank of data from the epidemiological Adjarian study, which was held according to all international criteria, was created, and after 5 years the repeated survey in the same population was held (2001). This region differed by dietary habits and ethno-social factors.

### Materials and Methods

Three territorial units were selected for the study: the city Batumi – that is situated in the plain region and Keda and Chulo that are situated in the mountain region. Ethno-social peculiarities were seen within the region.

In the epidemiological study the cluster method of the random sample was used. The three steps of randomization predetermined the same chances of getting into the sample for the all regions, villages, families, and adult members of the families that contributed to the maximal correction of the study.

The calculations were made with the help of program Statcalc (Epi Info – version 6.03). The sample size was 300 families from every region (900 families, e.g. 900 persons, because the persons for the survey were selected among the adult members of the families on the lottery basis). The persons of both gender and older than 20 years were investigated.

The survey included the filling out of the standard questionnaire (passport data, risk factors and non-fatal "end-points"), anthropometry (weight – to 0,1 kg, height – to 0,01 meters), body-mass index calculation (BMI).

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three-fold blood pressure measurement in the sitting position with the interval of 5 minutes, with the help of sphygmomanometer, and indication of the cuff size (pediatric, adult, big adult). The status of AH was defined by the mean index between second and third measurements.

The criteria of AH were: systolic blood pressure 140 mm Hg or higher and/or diastolic blood pressure 90 mm Hg or higher. Different levels of the blood pressure increase were considered when the prevalence of AH was analyzed: soft AH (the first degree) – 140–159/90–99 mm Hg; moderate AH (the second degree) – 150–179/100–109 mm Hg; severe AH (the third degree) – 180/110 mm Hg and higher, isolated systolic hypertension – systolic blood pressure 140 mm Hg and higher, and diastolic blood pressure less than 90 mm Hg [5].

The statistical indices such as the prevalence of the disease (P), odd ratio (OR), cumulative incidence (CI) with the 95% confidential interval, were determined [6].

The entire studied contingent was invited to a repeated study after 5 years (900 persons). Due to the high level of migration during this period, as well as the high mortality the response of the dynamic survey constituted only 24,7% (the highest response was in Batumi – 36,2%).

The primary investigation (1996) was epidemiological by its protocol, without any prevention methods. The results were given to the regional health care managements.

During the secondary study the prevention program (educational, medicamental and non-medicamental prevention of AH) was held parallel to the investigation of the epidemiological situation in dynamics.

### Results

The prevalence of the AH in the disorganized population of the Adjarian region constituted: in a whole population – 26,9%, in the Batumi city – 29,2%, in the Keda city – 28,0%, in the Chulo city – 23,7%.

The altitude of the location had no effect on the arterial hypertension.

Persons with the anamnesis of AH had increased BP 2,7 times more often during examination (OR=2,66, CI=1,33–5,65) than those without this diagnosis in the past.

High blood pressure was also seen in the group of treated hypertensive patients, and it was connected with irregular and inadequate treatment. In this group the increase of blood pressure was seen in 81% of cases.

Hypodynamia and excess alcohol abuse (OR=1,67, CI=1,00–2,78) were connected with the AH prevalence.

It was interesting that the obesity had practically no effect on the blood pressure levels in non-smokers, while in obese patients the increase in blood pressure levels was closely connected with smoking.

17% of the patients had stroke in anamnesis, 16% – myocardial infarction, all of them had arterial hypertension. The 5 years dynamic of mortality constituted 24,8%, the index of cardiovascular mortality in the overall mortality – 80%. 60% were females in the age group of 60 and older, in 60% of patients the cause of death was stroke (all were hypertensive).

As a result, in 2001 the prevalence of AH doubled (increased by 49,8%).

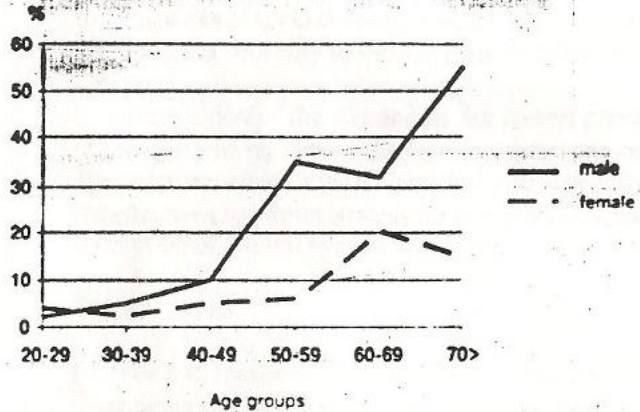


Figure 1. Dependence of AH prevalence upon age and gender

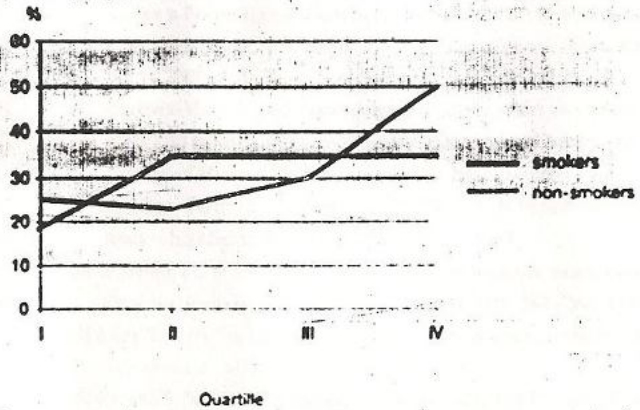


Figure 2. Percentage of hypertension in smokers and non-smokers according to the quarters of BMI.

The most common risk factors were psychosocial stress (58,6%) and high dietary salt intake (56,2%), which are typical for Georgia population, especially for western regions.

The characteristic of the non-response population is of special interest. The examination of these groups was provided ambulatory (at their homes).

In compare to responders, these persons were mostly single, with low level of education and high levels of behavioral risk factors. Higher incidence of severe forms of arterial hypertension was seen in these patients.

### Discussion

In Adjaria the prevalence of AH in disorganized population constituted in dynamics: 26,9% (1996), 49,8% (2001).

It is widely known, that the alteration of the disease prevalence depend on activity of migration processes, emigration of the healthy and unhealthy people, and also on mortality and aging of population [6].

Considering the age and the structure of morbidity of emigrational contingent (17% of the population is in the age group of 40 and older) and the high mortality, the prevalence of AH in our country is higher.

Fatal and non-fatal cases of myocardial infarction and stroke are associated with AH. Alcohol abuse and high BMI facilitate the increase in the AH incidence.

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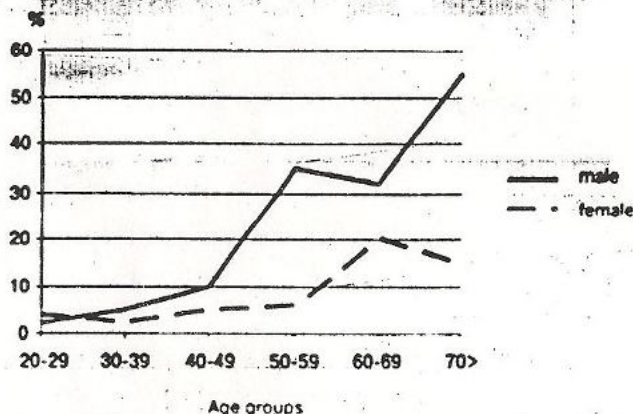


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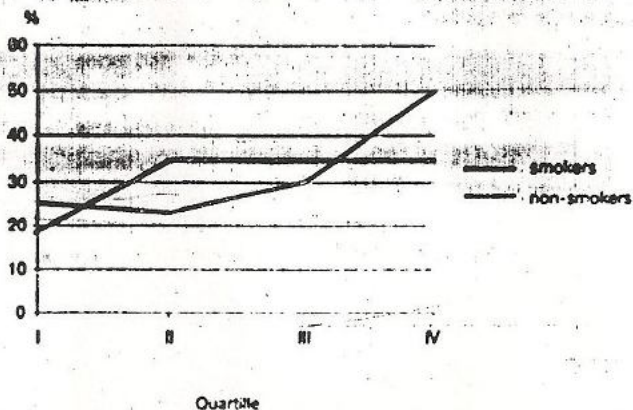


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