Influence of risk factors of cardiovascular diseases upon essential hypertension formation and target organs lesion in adolescents.

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A large quantity of studies, which showed that risk factors formation begin in children and adolescents, were performed all over the world.
The aim of the work:

• To study the frequency of risk factors (RF) of cardiovascular diseases (CVD) in adolescents with essential arterial hypertension (EAH) at different stages of its formation and to assess their influence upon the target organs lesions.
Target subject characteristics

326 adolescents at the age of 12 - 18 years old.
The average age was 14,9± 2,0 лет

Note: WCH – “white coat hypertension”; LAH – liable arterial hypertension; st.AH – stable arterial hypertension
**Entry criteria**

- Adolescents at the age of 12-18 years old;
- BP higher than 95 percentile of distribution for corresponding sex, height and age, reported thrice in 10-14 days at a pediatrician’s

**Exclusion criteria**

- Adolescents younger 12 years old and older 18 years old;
- Adolescents with symptomatic AH;
- Adolescents taken antihypertensive medication during the study
Study methods

- 24-hour blood pressure monitoring
- Risk factors study included assessment of frequency of passive and active smoking, low physical activity, family history of CVD and overweight.
- Brain MRI was performed using MRI scanner “Magneton-OPEN”.
- Left ventricle (LV) function and central hemodynamics were assessed according to Echo data.
Frequency of major risk factors of CVD in adolescents with arterial
Influence of CVD risk factors on st. AH formation in adolescents

- Passive smoking st. AH/WCH: 8.33
- Passive smoking st. AH/LAH: 4.76
- Overweight st. AH/WCH: 2.94
- Overweight st. AH/LAH: 3.7
- Family history of CVD st. AH/WCH: 5.5
- Family history of CVD st. AH/LAH: 3.46
Types of structural and geometrical LV myocardium change in adolescents with essential AH

- Normal geometry: 77%
- Eccentric hypertrophy: 15%
- Concentric remodelling: 6%
- Concentric hypertrophy: 2%
Frequency of structural and geometrical change of left ventricle myocardium at different stages of essential AH formation in adolescents
Correlation of overweight with morphofunctional heart parameters in adolescents with essential AH

- Weight increase of 1 kg leads to left atrium enlargement up to 0.19 mm (0.06: 0.32), p=0.0042) and decrease of indices of systemic vascular resistance of 12.53 dyn·s/sm5 (-24.93:-0.13), p=0.048.
Prevalence of structural brain changes in adolescents with essential arterial hypertension (N=150)

HE - hypertensive encephalopathy
Correlation of CVD risk factors with target organs lesion in adolescents with essential arterial hypertension

- Family history of idiopathic hypertension
- Smoking
- Pulse pressure level
- Triglyceride level
- Brain structural changes
- Vessels endothelium damage - endothelium dysfunction?
- Heart change of LV myocardium geometry
- SBP time index per night
- Average BP per day
- Insulin resistance
- Overweight
Conclusion

- Smoking, overweight and family history of IH favour increase of stable form of disease.

- Family history of IH and active smoking contributed into LV hypertrophy formation by increase of pulse pressure level, and overweight by increase of insulin resistance HOMA index.
• Overweight influenced indirectly on hypertensive encephalopathy formation by increase of time index of SBP at night

• Preventive measures in all adolescents with essential AH allow stopping the progression of the disease and favour involution of disease symptoms.