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# ARTERIAL STIFFNESS AND THE RISK OF HEART FAILURE FORMATION IN ROTATIONAL SHIFT WORKERS IN THE ARCTIC

## AIM:

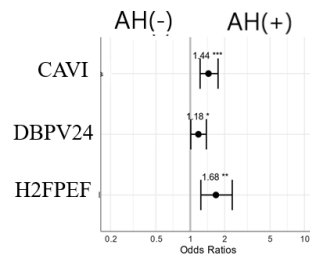
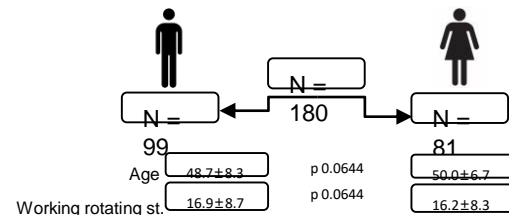
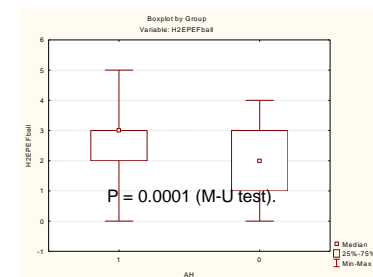
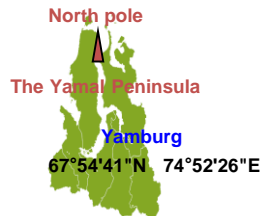
To investigate factors associated with arterial hypertension (AH) and assess their relationship in rotational shift workers in the Arctic region.

## DESIGN AND METHODS:

Within 6 days of September 2019, in the polar settlement of Yamburg (68 N), on the basis of Yamburggazdobycha LLC medical unit, 180 individuals (48.7 ± 8.3 years), working rotating shifts (16.9 ± 8.7 years) were enrolled via medical examination. Patients were divided into 2 groups according to the level of blood pressure (BP): Group 1 (Gr. 1) included 86 individuals with AH of 1,2 stages; Group 2 (Gr. 2) comprised 97 individuals with BP <140/90 mm Hg. Ultrasound examination of carotid arteries (CA) was performed, Peterson's elastic modulus (Ep), β-stiffness index, cardio-ankle vascular index (CAVI), pulse wave velocity (PWV) were determined; ABPM was performed; EchoCG was conducted using calculation of probability for heart failure with preserved ejection fraction ( HFpEF) by the H2FPEF score (Heavy; Hypertensive; Atrial Fibrillation; Pulmonary Hypertension; Elder; Filling Pressure); blood lipid spectrum, inflammatory markers, brain natriuretic peptide were determined.

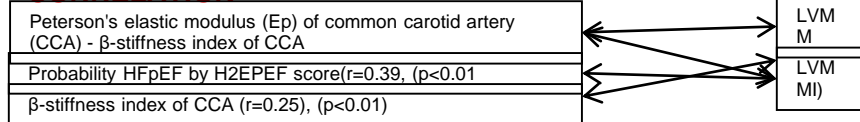
## RESULTS:

In Gr.1 vs Gr.2, elevated levels of left CAVI (7.9 vs 7.4) (p=0.022) and right CAVI (7.9 vs 7.5)(p=0.045) were registered; PWV : 13.8 m/s vs 12.6 m/s (right), (p<0.001) and 13.9 m/s vs 12.6 m/s (left), (p<0.001); triglycerides, (p = 0.03); very low density lipoprotein cholesterol, (p = 0.054); homocysteine, (p = 0.025). Probability of HFpEF by the H2FPEF score was higher in Gr.1 than Gr.2 (p<0.001). According to logistic regression analysis, data of odds ratio (OR) determined the risk of AH developing with increasing of PWV (OR=1.444); 24-hour diastolic blood pressure variability (DBPV24) (OR = 1.164); probability of HFpEF by the H2FPEF score (OR = 1.677). Relationships of Peterson's elastic modulus (Ep) of common carotid artery (CCA) with left ventricular myocardial mass (LVMM) (r=0.39), (p<0.01), LVMMI (r=0.39), (p<0.01), probability HFpEF by H2EPEF score (r=0.27), (p<0.01); β-stiffness index of CCA with LVMM (r=0.25), (p<0.01) were found.



Data of odds ratio (OR) determined the risk of AH developing

## CORRELATION



## CONCLUSION:

Logistic regression results of odds ratios for indicators enable to estimate AH as a risk factor for HFpEF by the H2FPEF-score (OR=1.677) in rotational shift workers in the Arctic region. Associations of AS with LVMM and LVMMI, HFpEF signs may indicate processes of simultaneous interconnected formation of arterial and cardiac stiffness.