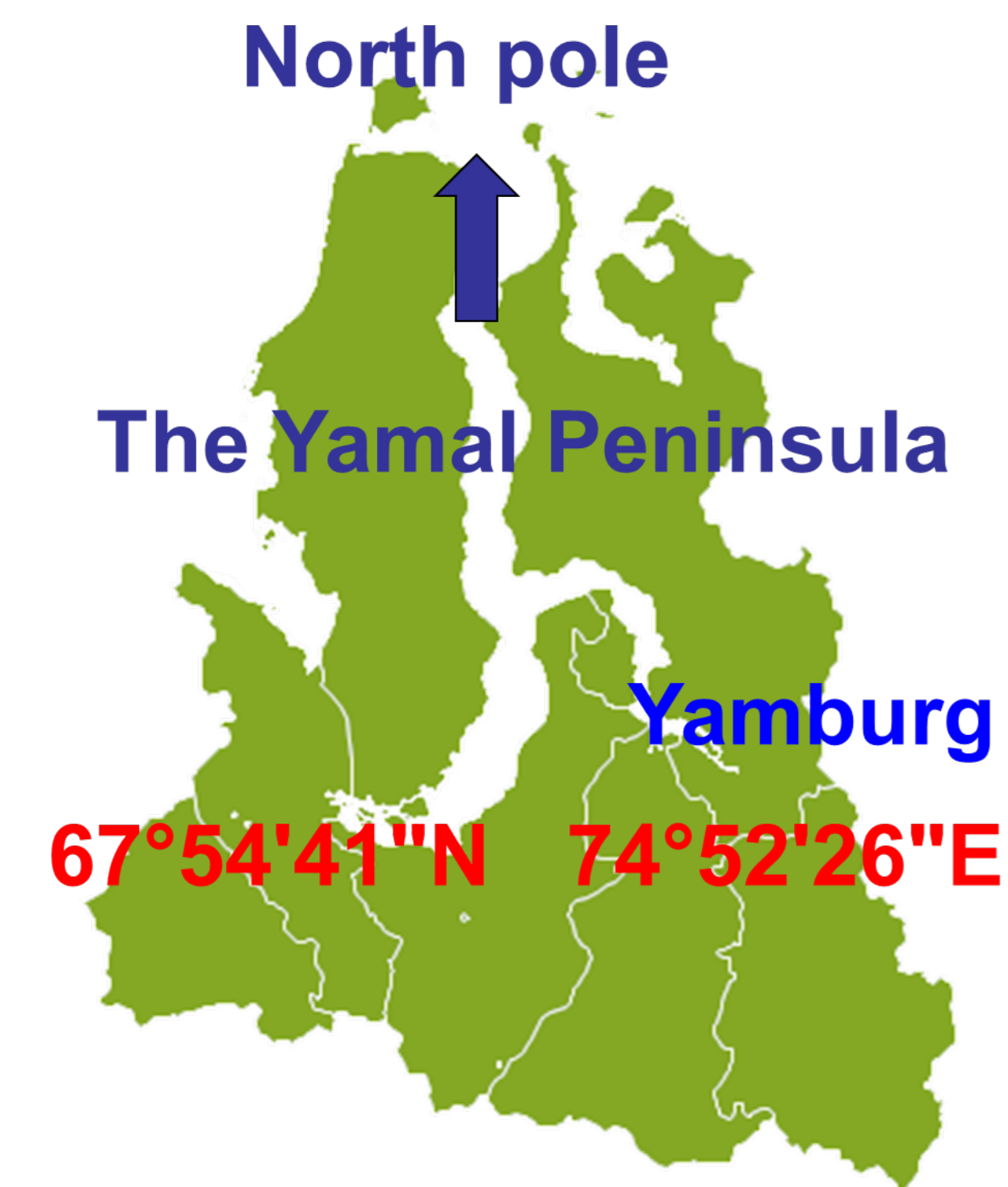


SUBCLINICAL CAROTID ATHEROSCLEROSIS: ROLE OF INFLAMMATION, CHOLESTEROL, HEMODYNAMIC LOAD AND SEX IN ROTATIONAL SHIFT WORKERS IN THE ARCTIC

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Aim: To study feasibility of atherosclerotic plaque (AP) detection in individuals working in the Arctic via rotating shifts (ARS) regarding sex, arterial hypertension (AH), immune inflammation.



Methods. In Yamburg village (68° 21' 40" N), 99 males (M) and 81 females (F) with AH 1,2 stages and normotensive individuals, comparable in age, work experience in ARS, office blood pressure were examined. Ultrasound examination of carotid arteries (CA), biochemical blood test was performed. Statistica 8,0 (Stat Soft, USA), IBM SPSS Statistics 23. (IBM, USA).

Results. Analysis was conducted in M and F groups with AP (n=98)/without AP (n=82): among them 57 M (58%), 41F (51%) were with AP, $P\chi^2=0.6116$; with/without AH. In AH M, more often than in normotensive M, AP was visualized in CA lumen: 72% (44 out of 61) vs 34% (13 out of 38), $P\chi^2=0.0209$. Probability of AP in M was associated with hs-CRP (p=0.052), level of VLDL CH (p=0.038), C-peptide (p=0.004), IL6 (p=0.048); with level of VLDL CH (p=0.052) in F only. In M with AP, strong association with mean daily blood pressure parameters was found.

Conclusions

CA AP associated with AH in ARS was frequently detected in M. Regardless of blood pressure, AP in M was associated with systemic inflammation, raise of pro-inflammatory cytokines and increase in VLDL CH level. ROC-analysis revealed relationship of AP only with VLDL CH in F. In AH M and F, AP was associated with systemic inflammation, pro-inflammatory cytokines due to AH presence.

Table 1 The ODDS RATIO OF THE INFLUENCE OF BASIC BIOCHEMICAL PARAMETERS ON THE PROBABILITY OF DETECTION OF ASB IN MEN (logistic regression- forced inclusion)

Covariates	B(SD)	p	Exp(B); 95% SI for EXP(B)
AH (1)	1,913(0,027)	0,025	1,028; 1,005 - 2,662
Age	0,238(0,105)	0,027	1,103; 1,032 - 1,559
Sex (Males)	4,702(2,124)	0,027	1,196; 1,713 - 6,979
C-peptide	0,763 (0,264)	0,004	2,146; 1,279 - 3,599
VLDL CH	0,519 (0,365)	0,038	1,218; 1,014 - 1,511
ApoB	0,278 (0,018)	0,070	0,992; 0,959 - 1,027
Homocysteine	0,094 (0,052)	0,073	1,098; 0,991 - 1,217
IL6	0,269 (0,224)	0,056	1,151; 0,991 - 1,261
IL10	-0,271 (0,022)	0,048	0,274; 0,096 - 0,658
hs-CRP	0,297 (0,041)	0,052	1,027; 1,047 - 1,113

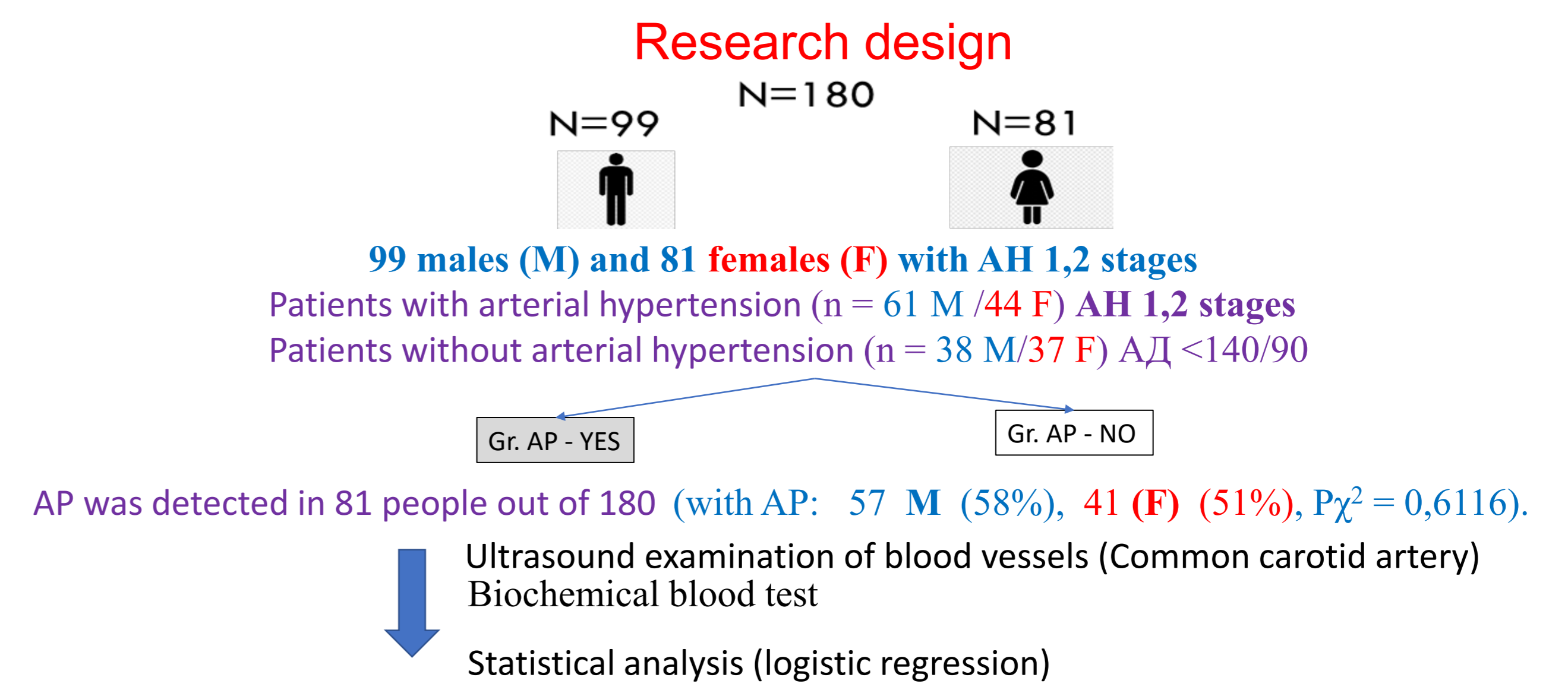
Table 2 The ODDS RATIO OF THE INFLUENCE OF BASIC BIOCHEMICAL PARAMETERS ON THE PROBABILITY OF DETECTION OF ASB IN WOMEN (logistic regression- forced inclusion)

Covariates	B(SD)	P	Exp(B); 95% SI EXP(B)
AH (1)	-0,947(0,496)	0,056	0,388; 0,147 -1,026
Age	0,080(0,044)	0,065	1,084; 0,995-1,180
VHDL CH	-6,885 (3,179)	0,030	0,191; 0,111 - 0,520
hs-CRP	1,287 (0,11)	0,089	1,275; 0,805 - 1,931
VLDL CH	1,484 (0,064)	0,052	1,121; 1,021 - 1,911
ApoB	0,532 (0,151)	0,145	0,702; 0,267 - 2,287
Homocysteine	0,430 (0,174)	0,014	1,537; 1,092 - 2,163
IL6	0,209 (0,51)	0,062	0,964; 1,245 - 1,803
IL10	-1,384 (0,636)	0,030	0,25; 0,072 - 0,872

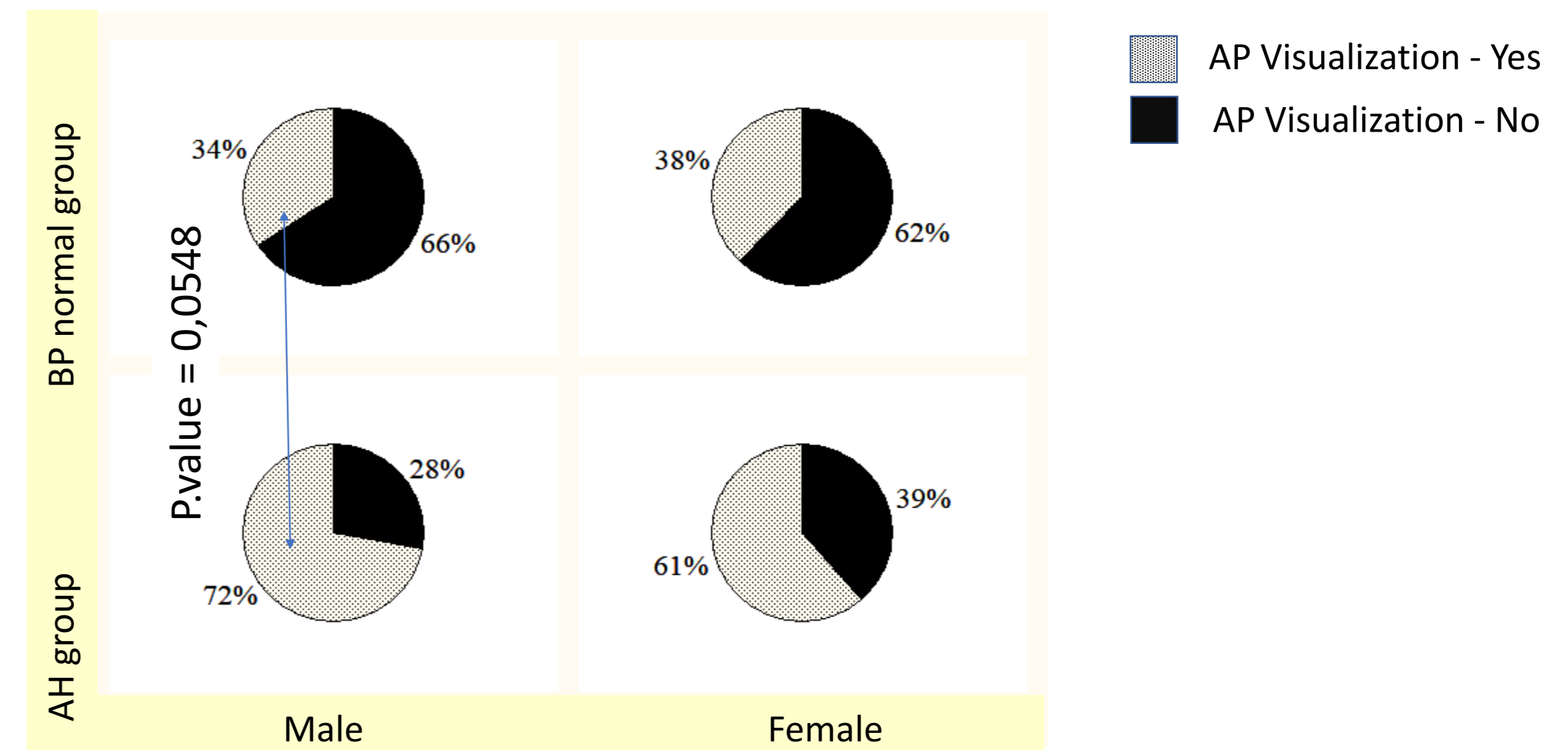
Table 2 The ODDS RATIO OF THE INFLUENCE OF THE MAIN PARAMETERS OF DAILY BLOOD PRESSURE MONITORING ON THE PROBABILITY OF DETECTION OF AP (logistic regression – forced inclusion)

Covariates	B(SD)	p	Exp (B); 95% SI EXP(B)
AH (1)	-1,388 (0,400)	0,001	0,250; 0,114 -0,547
Age	0,094(0,029)	0,001	10,098; 10,038 - 10,161
Sex (M)	-0,106(0,347)	0,760	0,899; 0,456-1,776
DBP24	-0,509(0,361)	0,159	0,601; 0,296 - 10,221
DBPvar24	-0,177(0,090)	0,050	0,838; 0,703 - 10,000
DBPday	0,421(0,280)	0,133	10,523; 0,880 - 20,637
DBPnight	0,103(0,103)	0,318	10,108; 0,906 - 10,355
DBPvar night	0,082(0,057)	0,153	10,086; 0,970 - 10,215
DIDBP	-0,006(0,050)	0,903	0,994; 0,900 - 10,097

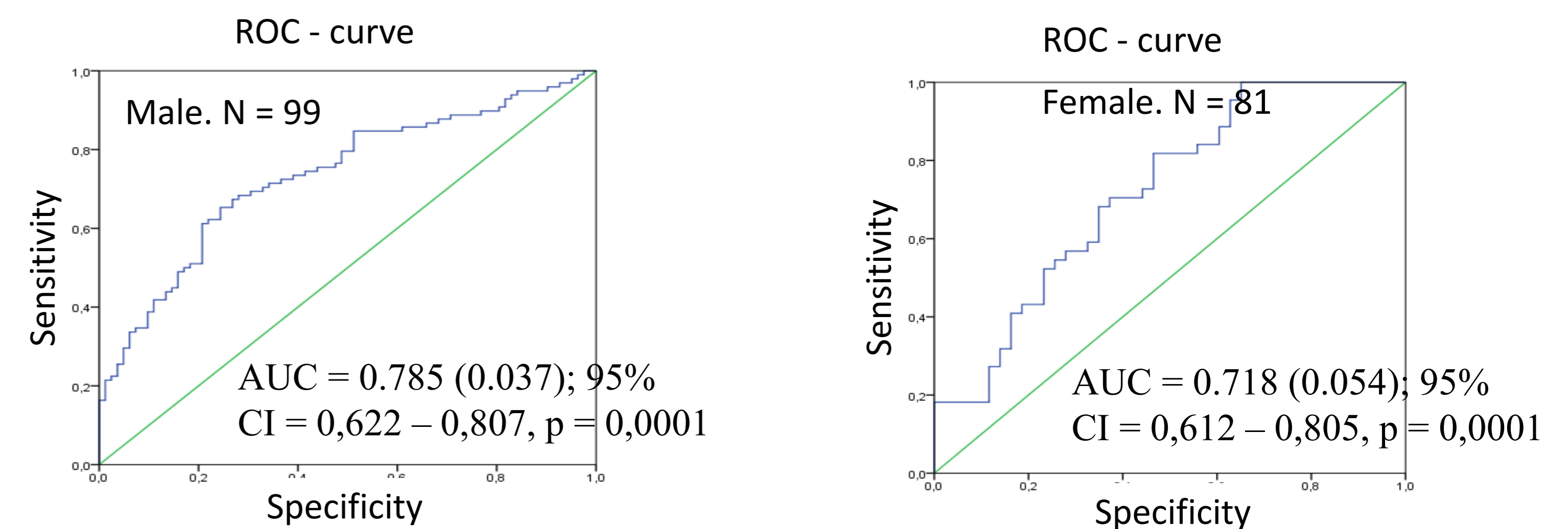
Note: hs-CRP – hs- C-reactive protein, IL6,10 – Interleukins; VLDL CH - Very low density cholesterol; VHDL CH - high-density cholesterol; DBP – Diastolic Blood Pressure; var – variability; ApoB - apoprotein B



Pict 1. Frequency of AP visualization in groups M and F, depending on the blood pressure level



Pict 2. Data from the ROC analysis of sensitivity and specificity of the probability of visualization of AP in the ACC, according to the parameters of the state of the arterial wall in men (A) and women (B)



Pict 3. The levels of office SBP and DBP in M and W with normal and elevated blood pressure, depending on the presence of visualized AP in the ACC.

