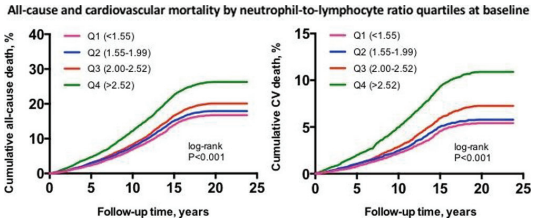
were significantly and independently associated with all-cause death (hazard ratio (HR) 1.12, 95% confidence interval (CI) 1.10–1.15), CV death (HR 1.10, 95% CI 1.06–1.14) and non-CV death (HR 1.04, 95% CI 1.01–1.07), ischaemic stroke (HR 1.08, 95% CI 1.03–1.12), coronary events (HR 1.08, 95% CI 1.04–1.12) and aortic valve stenosis-related events (HR 1.10, 95% CI 1.02–1.19).



Conclusions: Neutrophil-to-lymphocyte ratio is a wide available blood marker of systemic inflammation and an independent predictor of long-term CV morbidity and mortality in middle-aged general population.

PREVENTIVE CARDIOVASCULAR RISK

P618
Prediction of subclinical atherosclerosis using an ultra-sensitive cardiac troponin I assay: data from the Akershus Cardiac Examination (ACE) 1950 Study

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Background: Concentrations of cardiac troponin I (cTnI) are strongly associated with risk of incident myocardial infarction (MI) in the general population, and this association is particularly pronounced in women. The association between cTnI and subclinical stages of atherosclerosis in men and women does however remain unclear.
Methods: We measured cTnI with a novel ultra-sensitive assay (us-cTnI) on the Singulex Clarity System in 1745 women and 1666 men participating in the prospective observational Akershus Cardiac Examination (ACE) 1950 Study, which invited all subjects born in 1950 residing in Akershus county, Norway. All study participants were free from known coronary heart disease and underwent extensive cardiovascular phenotyping at baseline, including carotid ultrasound (common-, external-, and internal carotid artery on both sides). Significant subclinical atherosclerosis was defined as being in the upper decile of quantitative carotid plaque burden.
Results: Concentrations of us-cTnI were measurable in 99.8% of study participants. Participants with subclinical atherosclerosis were more frequently male with prevalent hypertension, diabetes mellitus, and COPD, and more frequently current smokers without higher education. us-cTnI concentrations were also higher in this patient group (1.24 [0.79–1.94] vs. 1.01 [0.69–1.57] ng/L; p<0.001). In the total cohort, concentrations of us-cTnI were significantly associated with subclinical atherosclerosis (OR 1.34 [1.16–1.54]), this association was barely attenuated in multivariate analysis (OR 1.17 [0.99–1.39]). In separate sex specific analyses, no association with us-cTnI was found for women. For men, however, significant associations were found even in multivariate analyses (Table).

Table 1. Associations between us-cTnI and subclinical atherosclerosis

		Odds ratio (95% CI)		
Cardiac troponin I		Model 1	Model 2	Model 3
Continuous	Both	1.34 (1.16–1.54)	1.19 (1.02–1.39)	1.17 (0.99–1.39)
	Female	1.14 (0.84–1.55)	1.14 (0.84–1.55)	1.05 (0.73–1.50)
	Male	1.22 (1.01–1.46)	1.21 (1.01–1.45)	1.22 (1.01–1.48)
Q4 vs Q1	Both	1.56 (1.08–2.25)	1.55 (1.07–2.25)	1.52 (1.02–2.25)
	Female	1.58 (0.85–2.94)	1.58 (0.85–2.94)	1.28 (0.66–2.49)
	Male	1.55 (0.98–2.46)	1.55 (0.98–2.46)	1.76 (1.07–2.92)

Model 1, unadjusted. Model 2, adjusted for sex (analysis for both sexes only) and age. Model 3, adjusted for sex (analysis for both sexes only), age, BMI, eGFR, total and HDL cholesterol, CRP, education, hypertension, diabetes mellitus and smoking status. Q, sex specific quartiles of us-cTnI.

Conclusion: Cardiac troponin I measured with the us-cTnI assay is independently associated with subclinical atherosclerosis in men, but not in women.

P619
Incident premature coronary heart disease in women: an analysis of 53 biomarkers from the Women's Health Study

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Background: Premature coronary heart disease (CHD) is associated with high morbidity and mortality. The underlying predictors of premature CHD, particularly for women, are incompletely characterised.

Purpose: To compare biomarker profiles predictive of incident premature (<65yr) versus conventional (≥65yr) CHD in apparently healthy women in the prospective Women's Health Study.
Methods: Two sub-cohorts were defined based on age at enrollment: <65years old (premature; n=25042) and ≥65years old (conventional; n=2982). Self-reported cardiovascular risk factors, baseline levels of 53 biomarkers related to lipids, lipoprotein particle concentration and size, inflammation, and metabolism were analysed. Women were followed for incident CHD and analysed with Cox regression models adjusted for standard risk factors.
Results: CHD incidence was 2% (n=435/25042) and 12% (n=343/2982) in premature and conventional cohorts, respectively. While premature and conventional CHD shared risk factors including LDL-C, HDL-C and hsCRP, the strength of associations with selected biomarkers differed. Lipoprotein(a), triglyceride-rich lipoprotein (TRL) particles, HDL size, and inflammatory biomarkers such as protein glycan side chains (GlycA) and fibrinogen showed stronger associations with premature CHD (Table). Biomarkers such as citrate showed no association with either cohort (not shown).

Risk of Incident CHD (adjusted HR per SD)

Biomarker	Premature CHD	Conventional CHD	p value for interaction (premature vs conventional)
LDL-C	1.33 (1.23–1.45)	1.18 (1.07–1.31)	0.07
HDL-C	0.62 (0.55–0.70)	0.85 (0.76–0.96)	0.0002
Triglycerides	1.45 (1.32–1.58)	1.22 (1.09–1.37)	0.02
Lipoprotein (a)	1.30 (1.18–1.43)	1.08 (0.97–1.21)	0.02
Apo B	1.53 (1.41–1.66)	1.31 (1.17–1.46)	0.02
Apo A-I	0.72 (0.65–0.80)	0.98 (0.87–1.10)	<0.0001
LDL particles	1.51 (1.39–1.64)	1.30 (1.17–1.44)	0.03
LDL particle size	0.78 (0.71–0.85)	0.96 (0.86–1.07)	0.003
TRL particles	1.38 (1.26–1.50)	1.19 (1.08–1.32)	0.03
TRL particle size	1.38 (1.24–1.52)	1.21 (1.08–1.37)	0.11
HDL particles	0.87 (0.78–0.96)	1.01 (0.90–1.13)	0.06
HDL particle size	1.01 (0.90–1.13)	0.95 (0.85–1.07)	<0.0001
Inflammatory			
Fibrinogen	1.31 (1.22–1.41)	1.07 (0.97–1.18)	0.0013
hsCRP	1.37 (1.24–1.52)	1.23 (1.08–1.40)	0.19
GlycA	1.33 (1.21–1.45)	1.08 (0.96–1.21)	0.005
ICAM-1	1.22 (1.13–1.32)	1.02 (0.90–1.15)	0.009
Metabolic			
Valine	1.17 (1.07–1.27)	1.02 (0.91–1.14)	0.05
Leucine	1.13 (1.03–1.24)	0.96 (0.85–1.07)	0.02
Isoleucine	1.19 (1.09–1.29)	1.06 (.95–1.19)	0.11
Alanine	1.08 (0.98–1.20)	0.91 (0.81–1.02)	0.02
Homocysteine	1.12 (1.03–1.23)	0.98 (0.87–1.11)	0.08
Hemoglobin A1c	1.12 (1.06–1.17)	0.95 (0.87–1.05)	0.007

Separate Cox models for each biomarker adjusted for 13 factors including age; smoking; systolic blood pressure; diabetes; family history of premature MI.

Conclusions: We identified a distinctive biomarker profile that predicts future premature CHD in initially healthy women, with significant differences in selected biomarkers for risk of premature versus conventional CHD. These findings could aid in primary preventive screening of premature CHD.
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P620
Atrial pacing: A new predictor for atrial high rate episodes in patients with dual-chamber pacemakers

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Introduction: Atrial fibrillation (AF) is the most prevalent cardiac arrhythmia with substantial risk of thromboembolic complications. Dual-chamber pacemakers are reliable in the detection of subclinical and clinical AF and they could be used to identify those patients at risk.
Aim: The aim of this study was to determine whether the percentage of atrial pacing (AP) in patients with dual-chamber pacemakers and no history of AF is related with the development of subclinical AF (atrial high rate episodes, AHRE) and clinical AF.
Methods: From February 2012 to September 2015 we recruited 249 patients. Follow-up took place 3 months after inclusion and then every year. Subclinical AF or AHRE was defined as an episode of atrial rate ≥225 bpm with a minimum duration of 5 min. The percentage of AP was determined as the mean AP during the first three visits. Clinical AF was defined as ECG documented AF. Cardiovascular events (including hospitalization for heart failure, atrial fibrillation, and cerebrovascular accidents) and mortality were also recorded.
Results: 249 patients (57% men; 75±9.7 years) were included. Mean time from pacemaker implantation was 9.2 months. After a mean follow-up of 33.2±11.2 months, 38.5% of the patients developed AHRE and 10.4% clinical AF. Patients with AP ≥50% presented significantly higher risk of developing AHRE (62.5% vs 32.3%, p<0.001) and AF (18.7% vs 8.6%, p=0.05). Patients with AP ≥50% had 3 times more risk of developing AHRE (OR 3.48; 95% CI[1.93–6.4] p<0,01), and 2 times more risk of developing clinical AF (OR 2.4; 95% CI[1.05–5.52]p=0.034).As it was expected, sinus node dysfunction was the main reason for pacemaker implantation in patients with AP ≥50%. The percentage of AP was not related to a higher risk of cardiovascular events or mortality.

Odds ratio for percentage of AP ≥50%

	OR	95% CI	p-value
Cardiovascular events	0.98	0.50–1.85	0.945
AF	2.43	1.05–5.52	0.034
Mortality	0.44	0.16–1.04	0.083
AHRE	3.48	1.93–6.40	<0.001

AF = atrial fibrillation; AHRE = atrial high rate episodes.

Conclusions: Atrial pacing ≥50% is related with higher risk of developing subclinical AF (AHRE) and clinical AF in patients with dual-chamber pacemakers and no history of previous AF. Our data suggest, that patients presenting a high percentage of AP should be closely followed during routinely pacemaker check-ups, assessing for subclinical AF.

P621
Gender-specific risk stratification of lipid markers on the 10-year cardiovascular disease: the ATTICA study

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Background/Introduction: Apolipoproteins vs. the typical lipoproteins have been suggested as robust predictors of cardiovascular diseases (CVDs). Subsequently, there are indications that this association may be more pronounced in females compared with males, usually presented as novel biomarkers.
Purpose: The aim of the present work was to evaluate the explanatory ability of apolipoproteins B100 and A1 (apoB100 and apoA1) over the typical lipoproteins levels (i.e. low density lipoprotein (LDL) and high density lipoprotein (HDL)) on the 10-year fatal/non fatal CVD event, separately on apparently healthy males and females.
Methods: In 2001–02, 1,514 men and 1,528 women (>18 years) free of CVD, at baseline, living in greater Athens area, Greece, were enrolled. In 2011–12, 10-year follow up was performed in 2,020 participants. At baseline, LDL, HDL and their respective apolipoproteins apoB100 and apoA1 were measured.
Results: The overall fatal/non fatal CVD event was 15.5% (n=317) (19.7% in males and 11.7% in females, p<0.001). Multivariate logistic regression analysis revealed that HDL and apoA1 were inversely associated with 10-year CVD event while a positive association was observed in case of LDL and apoB100 (all ps<0.05), as expected. However, a significant interaction was highlighted between the aforementioned lipid markers and the gender (all ps for interaction<0.10). Stratified multivariate models with gender as strata revealed that the significant protective effect of apoA1 and HDL was retained only in case of females (Odds Ratio (OR) per 1mg/dL=0.98 95%Confidence Interval (CI) 0.97, 0.99) and OR per 1 mg/dL=0.98 95% CI 0.96, 1.00, respectively) while the aggravating effect of apoB100 and LDL, only in males (OR per 1 mg/dL=1.02 95% CI 1.00, 1.03 and OR per 1 mg/dL=1.03 95% CI 1.00, 1.04, respectively). In all models the correct classification rate was from 82% to 88%. However, the classification ability as regards the cases was 15% and 19% in female-specific models adjusted for HDL and apoA1, respectively while as for males the respective rates in models adjusted for LDL and apoB100 were 26% and 29%. Using the area under the Receiver Operation Characteristic ROC) curve (AUC) analysis, apoB100 had the best discriminative ability in case of males while the respective marker in case of females was the apoA1 (Males: AUCapoB100=0.623, AUCLDL=0.605, AUCHDL=0.438, AUCapoA1=0.437 / Females: AUCapoA1=0.612, AUCHDL=0.545, AUCLDL=0.457, AUCapoB100=0.452).
Conclusions: The present outcomes state the hypothesis that apolipoproteins should be included in the daily clinical practice, instead of the commonly used lipid markers, yet after setting gender-specific risk stratification strategies.
Funding Acknowledgements: Hellenic Cardiology Society (HCS2002) and the Hellenic Atherosclerosis Society (HAS2003)

P622
Reclassification of 10-year coronary heart disease risk in a primary prevention setting: traditional risk factor assessment vs. coronary artery calcium scoring

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Background: In a primary prevention screening program of asymptomatic middle-aged executives, we sought to assess the degree of cardiovascular (CV) risk-reclassification provided by traditional CV risk assessment (with or without concomitant assessment of inflammation) vs. coronary artery calcification (CAC) scoring.
Methods: 1806 consecutive asymptomatic executives (age 55 years, 76% men), who underwent comprehensive screening in a primary prevention clinic between 3/2016 and 9/2017 were included. Standard risk factors, C-reactive protein (CRP) and CAC scoring (noncontrast gated chest computed tomography) were performed. % 10-year coronary heart disease (CHD) risk was calculated using Reynolds risk score (RRS), American College of Cardiology/American Heart Association atherosclerotic cardiovascular disease (ASCVD) score and multiethnic study on subclinical atherosclerosis CAC (MESA-CAC) score were calculated. % 10-year CHD risk for all scores was categorized as follows: a) <1% b) 1–5% c) 6–10% and d) >10%.
Results: Mean CRP, RRS, ASCVD and MESA-CAC scores were 2.1±4.2, 3.9±3.7, 5.5±5.1, 4.9±5.3. 54% had CAC of 0, while 21% had CAC >75th percentile. There was a significant, but modest correlation between MESA-CAC score and a) RRS (r=0.62) and b) ASCVD scores (r=0.65, both p<0.001). Distribution of patients within risk categories of RRS and ASCVD score with MESA-CAC are shown in Figures a-b. Compared to MESA-CAC, for RRS, a) 188 (10%) patients had an upgrade in risk and b) 538 (30%) patients had a downgrade in risk (total 40% reclassification of risk). Similarly, compared to MESA-CAC, for ASCVD score, a) 366 (23%) patients had an upgrade in risk and b) 329 (19%) patients had a downgrade in risk (total 41% reclassification of risk).

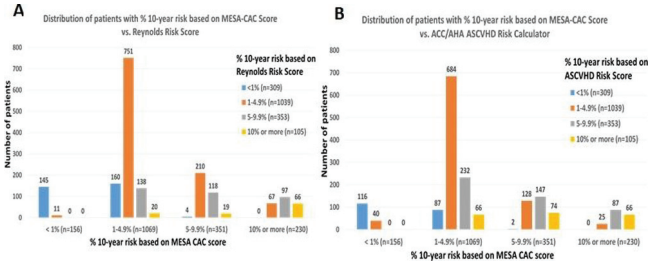

Figure 1

Conclusions: In a primary prevention screening program of asymptomatic middle-aged executives, RRS overestimates and ASCVHD underestimates 10 year CHD risk vs. MESA-CAC score. Addition of CAC scoring results in significant CV risk reclassification. A strategy of CAC quantification, in addition to traditional risk stratification, might provide better assessment of 10-year CVD risk.

P623
A simplified score for adherence to a Mediterranean dietary pattern predicts carotid atherosclerosis progression

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Background/Introduction: Mediterranean Diet is a way of eating based on the traditional foods (and drinks) of the countries surrounding the Mediterranean Sea. Carotid intima-media thickness (cIMT) is a marker of subclinical organ damage and predicts cardiovascular disease events in the general population and in at-risk cohorts.
Purpose: To assess whether the change of cIMT over time, measured in a relatively short time (15 months), is associated with the adherence to a simplified Mediterranean-like dietary pattern (MLDP) score.
Methods: "IMPROVE" is an observational longitudinal prospective cohort study involving 3,703 high-risk individuals from five European countries (Finland, Sweden, Netherlands, France and Italy). At baseline, an 11 items food-frequency questionnaire about the dietary habits during the year preceding the enrolment was administered. A MLDP score based on only seven nutritional items quite frequently used in the five European countries was then constructed. The predictive performance of the MLDP score was firstly validated versus the incidence of vascular events and then tested versus 15 month cIMT progression.
Results: The validity of the MLDP score was confirmed by a significant protective effect versus combined vascular events (adjusted hazard ratio = 0.75, p<0.001, for one step increase in the score) and particularly versus stroke (hazard ratio = 0.59, p=0.002). MLDP score strongly associated also with cIMT progression, even after adjustment for confounders (Ptrend = 0.001).
Conclusion(s): The MLDP score has the capacity to detect, in only 15 month, changes of carotid intima media thickness progression, which appears as a promising marker of dietary intervention efficacy.
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