РЕЗЮМЕТА - Публикации в чужди и в български издания, които са реферирани и индексирани в Scopus и Web of Science

1. **Feasibility and Functional Correlates of Left Atrial Volume Changes during Stress Echocardiography in Chronic Coronary Syndromes**

Morrone D., Arbucci R., Wierzbowska-Drabik K., Ciampi Q., ……**Simova I**….

Abstract

An enlarged left atrial volume index (LAVI) at rest mirrors increased LA pressure and/or impairment of LA function. A cardiovascular stress may acutely modify left atrial volume (LAV) within minutes. Aim of this study was to assess the feasibility and functional correlates of LAV-stress echocardiography (SE) Out of 514 subjects referred to 10 quality-controlled labs, LAV-SE was completed in 490 (359 male, age 67 ± 12 years) with suspected or known chronic coronary syndromes (n = 462) or asymptomatic controls (n = 28). The utilized stress was exercise in 177, vasodilator in 167, dobutamine in 146. LAV was measured with the biplane disk summation method. SE was performed with the ABCDE protocol. The intra-observer and inter-observer LAV variability were 5% and 8%, respectively. Δ-LAVI changes (stress-rest) were negatively correlated with resting LAVI (r = − 0.271, p < 0.001) and heart rate reserve (r = -.239, p < 0.001). LAV-dilators were defined as those with stress-rest increase ≥ 6.8 ml/m2, a cutoff derived from a calculated reference change value above the biological, analytical and observer variability of LAVI. LAV dilation occurred in 56 patients (11%), more frequently with exercise (16%) and dipyridamole (13%) compared to dobutamine (4%, p < 0.01). At multivariable logistic regression analysis, B-lines ≥ 2 (OR: 2.586, 95% CI = 1.1293–5.169, p = 0.007) and abnormal contractile reserve (OR: 2.207, 95% CI = 1.111–4.386, p = 0.024) were associated with LAV dilation. In conclusion, LAV-SE is feasible with high success rate and low variability in patients with chronic coronary syndromes. LAV dilation is more likely with reduced left ventricular contractile reserve and pulmonary congestion.

2. **Lung Ultrasound and Pulmonary Congestion During Stress Echocardiography**

Scali MC., Zagatina A., Ciampi Q., Cortigiani L., …..Monte I., **Simova I…**..

Abstract
Objectives

The purpose of this study was to assess the functional and prognostic correlates of B-lines during stress echocardiography (SE).

Background

B-profile detected by lung ultrasound (LUS) is a sign of pulmonary congestion during SE.

Methods
The authors prospectively performed transthoracic echocardiography (TTE) and LUS in 2,145 patients referred for exercise (n = 1,012), vasodilator (n = 1,054), or dobutamine (n = 79) SE in 11 certified centers. B-lines were evaluated in a 4-site simplified scan (each site scored from 0: A-lines to 10: white lung for coalescing B-lines). During stress the following were also analyzed: stress-induced new regional wall motion abnormalities in 2 contiguous segments; reduced left ventricular contractile reserve (peak/rest based on force, ≤2.0 for exercise and dobutamine, ≤1.1 for vasodilators); and abnormal coronary flow velocity reserve ≤2.0, assessed by pulsed-wave Doppler sampling in left anterior descending coronary artery and abnormal heart rate reserve (peak/rest heart rate) ≤1.80 for exercise and dobutamine (≤1.22 for vasodilators). All patients completed follow-up.
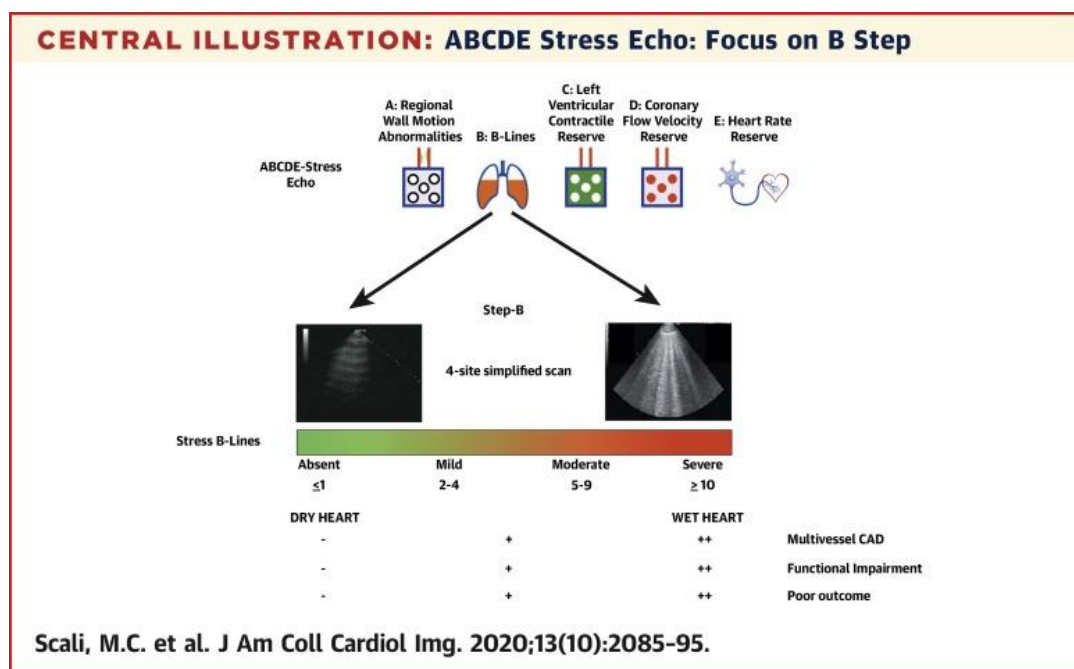
Results
According to B-lines at peak stress patients were divided into 4 different groups: group I, absence of stress B-lines (score: 0 to 1; n = 1,389; 64.7%); group II, mild B-lines (score: 2 to 4; n = 428; 20%); group III, moderate B-lines (score: 5 to 9; n = 209; 9.7%) and group IV, severe B-lines (score: ≥10; n = 119; 5.4%). During median follow-up of 15.2 months (interquartile range: 12 to 20 months) there were 38 deaths and 28 nonfatal myocardial infarctions in 64 patients. At multivariable analysis, severe stress B-lines (hazard ratio [HR]: 3.544; 95% confidence interval [CI]: 1.466 to 8.687; p = 0.006), abnormal heart rate reserve (HR: 2.276; 95% CI: 1.215 to 4.262; p = 0.010), abnormal coronary flow velocity reserve (HR: 2.178; 95% CI: 1.059 to 4.479; p = 0.034), and age (HR: 1.031; 95% CI: 1.002 to 1.062; p = 0.037) were independent predictors of death and nonfatal myocardial infarction.

Conclusions
Severe stress B-lines predict death and nonfatal myocardial infarction. (Stress Echo 2020–The International Stress Echo Study [SE2020]; NCT03049995)

Central Illustration

CENTRAL ILLUSTRATION: ABCDE Stress Echo: Focus on B Step

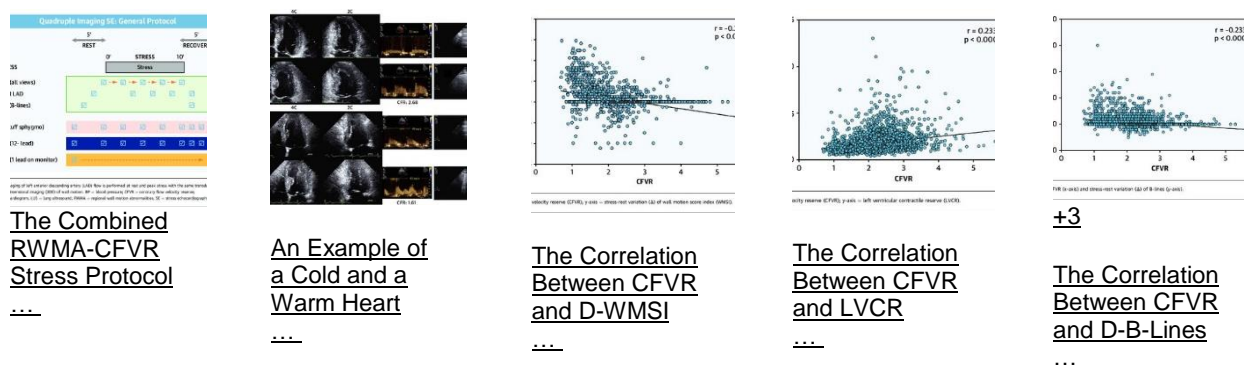Scali, M.C. et al. J Am Coll Cardiol Img. 2020;13(10):2085–95.

Download: Download high-res image (408KB)   Download : Download full-size image

Key Words : coronary artery disease, heart failure, lung ultrasound, stress echocardiography

Abstract and Figures

Background: The assessment of coronary flow velocity reserve (CFVR) in left anterior descending coronary artery (LAD) expands the risk stratification potential of stress echocardiography (SE) based on stress-induced regional wall motion abnormalities (RWMA).
Objectives: The purpose of this study was to assess the feasibility and functional correlates of CFVR. Methods: This prospective, observational, multicenter study initially screened 3,410 patients (2,061 [60%] male; age 63 ± 11 years; ejection fraction $61 \pm 9\%$) with known or suspected coronary artery disease and/or heart failure. All patients underwent SE (exercise, n = 1,288; vasodilator, n = 1,860; dobutamine, n = 262) based on new or worsening RWMA in 20 accredited laboratories of 8 countries. CFVR was calculated as the stress/rest ratio of diastolic peak flow velocity pulsed-Doppler assessment of LAD flow. A subset of 1,867 patients was followed up. Results: The success rate for CFVR on LAD was 3,002 of 3,410 (feasibility = 88%). Reduced (≤ 2.0) CFVR was found in 896 of 3,002 (30%) patients. At multivariable logistic regression analysis, inducible RWMA (odds ratio [OR]: 6.5; 95% confidence interval [CI]: 4.9 to 8.5; $p < 0.01$), abnormal left ventricular contractile reserve (OR: 3.4; 95% CI: 2.7 to 4.2; $p < 0.01$), and B-lines (OR: 1.5; 95% CI: 1.1 to 1.9; $p = 0.01$) were associated with reduced CFVR. During a median follow-up time of 16 months, 218 events occurred. RWMA (hazard ratio: 3.8; 95% CI: 2.3 to 6.3; $p < 0.001$) and reduced CFVR (hazard ratio: 1.5; 95% CI: 1.1 to 2.2; $p = 0.009$) were independently associated with adverse outcome.
Conclusions: CFVR is feasible with all SE protocols. Reduced CFVR is often accompanied by RWMA, abnormal LVCR, and pulmonary congestion during stress, and shows independent value over RWMA in predicting an adverse outcome.

The Combined RWMA-CFVR Stress Protocol
…

An Example of a Cold and a Warm Heart
…

The Correlation Between CFVR and D-WMSI
…

The Correlation Between CFVR and LVCR
…

+3

The Correlation Between CFVR and D-B-Lines
…

4. **ECG attenuation phenomenon with advancing age**

Abstract

Available online xxxx With advancing age, the conduction system and heart muscle cells undergo degenerative alterations affecting the electrocardiographic (ECG) parameters. The

goal of the study is to determine the effect of age on ECG parameters. Are these changes due to a 'normal aging' or are they indicative to a 'heart disease'? Italian Longitudinal Study on Aging (ILSA) database has been created to evaluate physiologic and pathologic modifications connected with aging. Standard 12-leads ECG recordings (10 s, 500 Hz) have been taken twice in a period of three years. The database consists of 890 individuals aged 65–84 years. Analysis of changes has been done also in two groups of individuals in ILSA database – with and without cardiovascular abnormality. This analysis showed a nearly equal age-related change in both groups. The main changes are reduction in the amplitudes of QRS- and T-waves, referred as 'ECG attenuation phenomenon'. $QRSt1 = 0.85$ mV at the time of the first recording t1, and $QRSt2 = 0.81$ mV at the time of the second recording t2, the period between the two recordings being three years (p b 0.0001). Respectively $Tt1 = 0.11$ mV, $Tt2 = 0.10$ mV, p = 0.0013. ECG attenuation phenomenon is more common in males, and it is not significant in females. This attenuation is manifested significantly also in healthy male group, suggesting geriatric changes of "normal aging". Nevertheless, some cardiovascular diseases, such as arrhythmias and hypertension, may have a strong influence on the QRS attenuation, and this supports the open question of the clinical relevance of the phenomenon. ECG attenuation phenomenon is more manifested in younger individuals and occurs independently of body mass. ECG attenuation phenomenon is a significant fact, and therefore it should be considered in any serial ECG study, for example in the ECG analysis for human identification.

5. **Multi-step Web-based Training: the Road to Stress Echo 2020**
    Carpeggiani C., Ciampi Q., Paterni M., De Nes M., Zagatina A., **Simova I**., Djordievic-Dikic A., Citro R., Colonna P., Picano E.
    REV ARGENT CARDIOL 2018;86:250-256.
    http://dx.doi.org/10.7775/rac.v86.i6.14286

Abstract
Background: A standardized training platform helps to achieve reading harmonization in stress echocardiography (SE) beyond regional wall motion abnormalities (RWMA).
Objective: To harmonize SE reading criteria across different laboratories.
Methods: The core lab prepared for readers an obligatory 2-hour web-based learning module for 5 parameters: RWMA; B-lines; coronary flow velocity reserve (CFVR) based on peak diastolic flow velocity on the left anterior descending coronary artery; left ventricular contractile reserve (LVCR, from raw measurements of end-systolic volume, ESV); systolic arterial pulmonary pressure (from raw measurements of peak tricuspid regurgitant jet velocity, TRV). The quality control test consisted of 20 cases selected by the coordinating center. The a priori determined pass threshold was 18/20 ($\geq$90%) with intra-class correlation coefficient between the coordinating lab and the peripheral reader >0.90.
Results: The certification was completed by 84 readers for RWMA, 65 for B-lines, 30 for CFVR, 24 for ESV and 20 for TRV. The mean reading time per attempt was shorter for TRV (9±4 min), CFVR (13±6 min) and B-lines (17±3 min), intermediate for ESV (24±7 min), and longer for RWMA (29±12 min, p <0.01).
Conclusions: A web-based learning platform improves image interpretation skills without need for expensive imaging equipment or a patient to scan. The road to certification is longer for RWMA, intermediate for ESV, and shorter for TRV, CFVR and B-lines.
Key Words: Stress Echocardiography - Web-based Platform - Quality Control.

6.   The Functional Meaning of B-Profile During Stress Lung Ultrasound

Scali MC., Zagatina A., Ciampi Q., Cortigiani L., …..**Simova I**., ……

The B-Profile of normal lung sliding with B-lines by lung ultrasound (LUS) identifies pulmonary congestion at rest and during exercise stress echocardiography (SE) in coronary artery disease (CAD) (1) or heart failure (HF) patients with either reduced (2) or preserved (3) resting left ventricular ejection fraction (EF). We hypothesized that patients developing B-lines during physical or pharmacological SE are likely to have a functional ischemic or extra-ischemic cause of vulnerability to interstitial pulmonary edema, which can be unmasked with simultaneous transthoracic echocardiography (TTE).

In this prospective study, we evaluated 2036 patients (727 females and 1,309 males; age 63 ± 11 years; EF $58 \pm 11\%$) with known or suspected CAD and/or HF recruited by 21 accredited laboratories of 8 countries (Argentina, Bulgaria, Brazil, Hungary, Italy, Poland, Russian Federation, and Serbia) of the SE 2020 study network (4). Exclusion criteria were severe arrhythmias or valvular or congenital heart disease evaluated based on clinical records and resting TTE before the enrollment. Of recruited patients, 780 (38%) had previous coronary revascularization procedure, 519 (25%) had previous myocardial infarction, 312 (15%) had history of dyspnea, and 142 (7%) had chronic obstructive pulmonary disease. The employed stress was exercise in 1167 (semi-supine, n = 812; upright bicycle, n = 348; post-treadmill, n = 7) or pharmacological testing in 869 patients (dipyridamole, n = 709; dobutamine, n = 150; adenosine, n = 10). The same cardiac transducer was used for TTE and LUS. We adopted the 4-site simplified scan 3, 4, from midaxillary to mid-clavicular lines on the third intercostal space. The positivity criterion for B-lines ("wet lung") was a stress score higher than rest for ≥ 2 points.

Non-parametric Spearman coefficient was used to assess linear correlation. Multivariate logistic regression analysis was performed to find predictors of any appearance or increment in stress B-lines. Statistical significance was set at $p < 0.05$.

Interpretable images were obtained in all patients. Regional wall motion abnormalities (RWMA) were present in 483 patients (24%). A "wet lung" was present in 512 patients (25%). Ischemic heart with wet lung was present in 213 patients (11%).

Peak Wall Motion Score Index (WMSI) was correlated with B-lines ($R = 0.46$; $p = 0.001$) (Figure 1). At multivariate logistic regression analysis, stress WMSI (odds ratio [OR]: 4.89; 95% confidence interval [CI]: 3.65 to 6.55; $p < 0.001$), peak systolic blood pressure (OR: 1.008; 95% CI: 1.004 to 1.011; $p < 0.001$), severe mitral regurgitation (OR: 2.38; 95% CI: 1.03 to 5.54; $p < 0.001$), systolic pulmonary arterial pressure >40 mm Hg (OR: 4.94; 95% CI: 1.41 to 17.32; $p < 0.012$), hypertension (OR: 1.36; 95% CI, 1.04 to 1.79; $p < 0.024$), and history of dyspnea (OR: 1.37; 95% CI: 0.98 to 1.92; $p = 0.066$) were associated with B-lines during SE. Stress E/e' >15 was more frequent in wet lungs (44 vs. 14%; $p < 0.001$) but not significant at multivariate analysis. Stress B-lines' appearance or increment was present in 3 of 27 patients with no CAD (11%), 5 of 26 (19%) with single-, 8 of 22 (36%) with double-, and 15 of 27 (55%) with triple-vessel disease ($p = 0.003$ for trend test).

Figure 1. Wet Lung and Regional Wall Motion Abnormalities During Stress
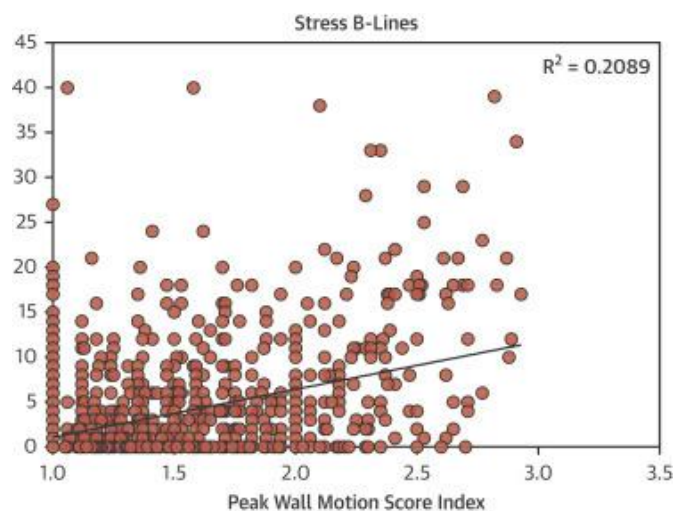
The correlation between peak wall motion score index (x-axis) and stress
B-lines (y-axis) in the entire population.

Dual imaging TTE-LUS during SE is feasible and simple, with 100% success rate and only minimal increase of imaging time. Stress B-lines are associated with more severe and/or extensive RWMA and CAD. In patients without inducible ischemia, stress B-lines are associated with severe mitral insufficiency, increased pulmonary pressure, and excessive systolic blood pressure increase during stress. The same probe was used for TTE and LUS and this may lower the image quality but does not affect to any significant extent B-lines quantification. B-lines also originate from pulmonary interstitial fibrosis, but these fibrotic B-lines do not increase during stress. During stress, B-lines are simpler to image and to measure, not degraded by hyperventilation and tachycardia, and inherently more quantitative than RWMA.

The integration of TTE and LUS identifies a spectrum of functional responses ranging from non-ischemic heart and dry lung up to very abnormal ischemic heart and wet lung, with all intermediate responses in between. (A full listing of the members of the Stress Echo 2020 study group can be found at the web site (5). Please note that these are members of the Stress Echo study group and not coauthors of this letter.)

7. Ranking of the most reliable beat morphology and heart rate variability features for detection of atrial fibrillation in short single lead ECG
Christov I., Krasteva V., Simova I., Neycheva T., Schmid R..
Physiological Measurement 2018; 39(9):094005
http://iopscience.iop.org/article/10.1088/1361-6579/aad9f0/meta

Abstract

Objective: This study participated in the 2017 PhysioNet/CinC Challenge dedicated to the classification of atrial fibrillation (AF), normal sinus rhythm (Normal), other arrhythmia (Other) and strong noise, using single-lead electrocardiogram (ECG) recordings with a duration <60 s. The aim is to apply a linear threshold-based strategy for arrhythmia classification, ranking the most powerful time domain ECG features that could be easily reproduced on any platform. *Approach*: An algorithm for time domain ECG analysis was designed to extract 44 features with focus on the following: noise detection; heart rate variability (HRV) analysis; beat morphology analysis and delineation of P-, QRS-, and T-

waves in the robust average beat; detection of atrial activity by the presence of P-waves in the average beat and atrial fibrillatory waves (f-waves) during TQ intervals. A linear discriminant analysis (LDA) classifier was optimized on the Challenge training set (8528 ECGs) by stepwise selection of a nonredundant feature set until maximization of the Challenge F1 score. Heart rate (HR) was an independent factor for the LDA classifier design, particular to bradycardia (HR $\leq$ 50 bpm), normal rhythm (HR = 50–100 bpm), tachycardia (HR $\geq$ 100 bpm). *Main results*: The algorithm obtained official Challenge F1 scores of 0.80 (Overall), 0.90 (Normal), 0.81 (AF), 0.70 (Other), and 0.54 (Noise) on the hidden Challenge test set (3658 ECGs). This is equivalent to a true positive rate (TPR) = 90.1% (Normal), 81.5% (AF), 67.7% (Other), and 69.5% (Noise), and a false positive rate (FPR) = 13.6% (Normal), 2.3% (AF), 7.7% (Other), and 1.5% (Noise). *Significance*: The top five features, which together contributed to about 94% of the maximal F1 score were ranked: (1) proportion of RR intervals differing by >50 ms from the preceding RR interval; (2) Poincaré plot geometry estimated by the ratio of the minor-to-major semi-axes of the fitted ellipse; (3) P-wave presence in the average beat; (4) mean percentage of the RR interval first differences; and (5) mean correlation of all beats against the average beat. The global rank of feature extraction methods highlighted that HRV alone was able to provide 92.5% of the maximal F1 score (0.74 versus 0.8). The added value of more complex ECG morphology analysis was less significant for Normal, AF, and Other rhythms (+0.02 to 0.08 points) than for Noise (+0.19 points); however, these were indispensable for wearable ECG recording devices with frequent artefact disturbance.

8. **Ethnic-Specific Normative Reference Values for Echocardiographic LA and LV Size, LV Mass, and Systolic Function: The EchoNoRMAL Study**
K.K.Poppe R.N.Doughty J.M.Gardin F.D.R.Hobbs J.J.V.McMurray S.F.Nagueh R.Senior L.Thomas G.A. Whalley E. Aune A. Brown………I.Simova K. Sliwa S. Stewart……..

Abstract
Objectives
This study sought to derive age-, sex-, and ethnic-appropriate adult reference values for left atrial (LA) and left ventricular (LV) dimensions and volumes, LV mass, fractional shortening, and ejection fraction (EF) derived from geographically diverse population studies.
Background
The current recommended reference values for measurements from echocardiography may not be suitable to the diverse world population to which they are now applied.
Methods
Population-based datasets of echocardiographic measurements from 22,404 adults without clinical cardiovascular or renal disease, hypertension, or diabetes were combined in an individual person data meta-analysis. Quantile regression was used to derive reference values at the 95th percentile (upper reference value [URV]) and fifth percentile (lower reference value [LRV]) of each measurement against age (treated as linear), separately within sex and ethnic groups.
Results
The URVs for left ventricular end-diastolic volume (LVEDV), LV end-systolic volume, and LV stroke volume (SV) were highest in Europeans and lowest in South Asians. Important sex and ethnic differences remained after indexation by body surface area or height for these measurements, as well as for the LRV for SV. LVEDV and SV decreased with increasing age

for all groups. Importantly, the LRV for EF differed by ethnicity; there was a clear apparent difference between Europeans and Asians. The URVs for LV end-diastolic diameter and LV end-systolic diameter were higher for Europeans than those for East Asian, South Asian, and African people, particularly among men. Similarly, the URVs for LA diameter and volume were highest for Europeans.

Conclusions

Sex- and/or ethnic-appropriate echocardiographic reference values are indicated for many measurements of LA and LV size, LV mass, and EF. Reference values for LV volumes and mass also differ across the age rang.

Уводна статия

1. **The proper care for elderly cardiac patients before rehabilitation**
   Simova I., Pavlova S., Tasheva I.
   European Journal of Preventive Cardiology First Published January 21, 2020
   https://doi.org/10.1177/2047487319900869

Cardiovascular diseases are still a main cause of mortality across the world. Numerous studies and meta-analyses have demonstrated the benefits of cardiac rehabilitation on hard clinical outcomes, including cardiovascular and all-cause mortality.[1,2] Even in patients aged 75 years and older cardiac rehabilitation improves functional parameters (such as peak oxygen consumption, distance walked in 6 min and inferior limbs peak 90° torque strength) and quality of life (QoL), as shown in the CR-AGE EXTRA study.[3]

Exercise capacity was proved to be a strong predictor of mortality.[4] This holds true also for elderly patients enrolled in cardiac rehabilitation programmes after an episode of heart failure decompensation – the physical activity scale for the elderly was shown to be a strong and independent predictor of mortality.[5]

Quantifying exercise limitation and its impact on lifestyle also has a value in establishing diagnosis and prognosis. To find the main predictors of pre-rehabilitation exercise capacity in elderly patients appears to have an impact in future improvement of managing these patients. The European study on effectiveness and sustainability of current cardiac rehabilitation programmes in the elderly (EU-CaRE) study is a prospective study comparing data and predictors of exercise capacity of patients undergoing cardiac rehabilitation in eight centres across Western Europe.…..

2. **What do our patients expect of mobile health?**
   Simova I., Petrov I.
   European Journal of Preventive Cardiology 2019; 26 (9):917–919
   https://journals.sagepub.com/doi/full/10.1177/2047487319830169

e-Health encompasses the use of information and communication technologies (ICTs) in the support of health and health-related activity.

e-Health is used as a general term, encompassing: (a) telemedicine and telecare (including disease management services, remote patient monitoring, teleconsultations and homecare); (b) clinical information systems (electronic medical records, decision support and monitoring of clinical and institutional practice); (c) integrated regional and national information networks and associated e-referrals and e-prescribing; (d) disease registries and other non-clinical

systems used for education, public health, patient/disease-related behaviour and healthcare management; (e) 'mobile' health (m-Health) including mobile applications (apps) – medical and public health practice supported by mobile technologies delivering health information, screening patients, monitoring physiological signs, providing direct care and patient education; (f) 'personalised' health (p-Health) – wearable or implantable micro- and nano-technologies with sensors and/or therapy delivery devices to help facilitate health and social-care decision-making and delivery (including fall detectors, implantable insulin pumps, defibrillator vests, etc.) and (g) 'big data' – large-scale integration and analysis of heterogenous data sources, usually of high volume and velocity.

Implantable devices offer a unique possibility for implementation of remote monitoring (RM). In patients with implantable devices, RM could be used to send information automatically about battery status, lead impedances, sensing and capture thresholds directly to the healthcare providers, reducing the number of outpatient visits in this way. Some systems also have the possibility of monitoring heart failure signs, such as pulmonary congestion, oedema or breathing difficulties. This could facilitate an earlier recognition of heart failure worsening and timely initiation of efforts to prevent rehospitalisation. …

3.   **Primary aldosteronism in AF patients - to screen or not to screen?**
     Simova I., Garvanski I.
     European Journal of Preventive Cardiology 2018; 25 (7):692-693

Atrial fibrillation (AF) is a growing epidemic worldwide, with almost 3% of the adult population being diagnosed with AF. Establishing a possible causal link between AF and primary aldosteronism (PA) could lead to an improved outcome in both the diagnostics and treatment of these patients.

A recent study from Mourtzinis et al. entitled 'Primary aldosteronism and thyroid disorders in atrial fibrillation: a Swedish nationwide case–control study', published in this issue of the journal, reports an increased prevalence of PA in patients with AF compared to an age and sex-matched group from the general population. This case–control study includes a large enough number of patients to detect a difference in a rare disease such as PA. The data for the study are gathered from the Swedish Patient Register and cases were randomly matched in a ratio of 1:2 with controls from the Swedish Total Population Register. The results show a higher prevalence of PA (0.056% compared to 0.024%), hypothyroidism (5.9% compared to 3.7%) and hyperthyroidism (2.3% compared to 0.8%) in the group with AF compared to the general population, all comparisons being statistically significant.

The possible indirect link between PA, hyperthyroidism and AF is supported by several studies and animal models, but the link between hypothyroidism and AF remains uncertain. Overt and subclinical hyperthyroidism increases the risk of AF, while hypothyroidism poses no risk or reduces the risk of this arrhythmia. Swedish data also show that blood pressure control in hypertension is associated with a lower risk of new-onset AF. In most clinical practices AF patients are screened for thyroid disorders, but should we also introduce PA screening in this group? Mourtzinis et al. tried to address this question analysing a large Swedish database. …

Писмо до Редактор

1.   **Hydroxychloroquine for prophylaxis and treatment of COVID-19 in health care workers**

Simova I., Vekov T., Krasnaliev J., Kornovski V., Bozhinov P. New Microbes and New Infections. 2020 available online
https://www.sciencedirect.com/science/article/pii/S2052297520301657
SCImago Journal Rank (SJR): 0.543
DOI: https://doi.org/10.1016/j.nmni.2020.100813

Abstract

Hydroxychloroquine (HCQ) exerts antiviral effects through several mechanisms. Our initial experience suggests that HCQ could be used for prophylaxis of COVID-19 infection in health care workers (HCW) and could help to control the virus in the early disease stages. We suggest a prophylactic strategy with HCQ for autumn-winter-spring 2020-2021.
Key words: COVID-19; hydroxychloroquine; prophylaxis; treatment; health care workers

Обзори

1. Predictors of Recurrence of Atrial Fibrillation in Patients After Radiofrequency Ablation

I., **Simova** I., Angelkov L., Matveev M.
European Cardiology Review 2019; 14(3):165–168.
DOI: 10.15420/ecr.2019.30.2 PMID: 31933685 PMCID: PMC6950489;
https://europepmc.org/article/med/31933685;

Abstract

Catheter ablation is a well-known treatment for patients with AF. Despite the growing knowledge in the field, the identification of predictors of recurrence of AF after catheter ablation is one of the primary goals and is of major importance to improve long-term results of the procedure. The aim of this article is to provide an overview of what has been published in recent years and to summarise the major predictors, helping cardiac electrophysiologists in the selection of the right candidates for catheter ablation.
Keywords
AF, catheter ablation, recurrence of arrhythmia, pulmonary vein isolation

2. T-wave Area Dispersion in Coronary Artery Bypass Grafting is Indicative for Increased Risk of Adverse Events in Diabetics

Simov D., Christov I., **Simova I.**
Current Diabetes Reviews 2019; 15(5):347-348.
doi: 10.2174/1573399815666190115150321;
https://www.eurekaselect.com/169011/article

Abstract:

Problems in measuring the QT-dispersion are associated mostly with the inaccurate location of the T-wave end. The complications are: (i) In methodology due to various definition for Tend, (ii) In automatic measurements, due to low amplitude of T-wave, presence of U-wave and noise, and (iii) In manual measurements, due to lack of repeatability in the results, and

involuntary subjectivism, when the QT-dispersion is measured by a person familiar with the ultimate goal of the study.

New ECG repolarization parameter, 'T-Wave Area Dispersion' (TWAD), has been defined by Kenttä et al. 2018. Clustering ability of TWAD for prediction of risk for Sudden Cardiac Death (SCD) has been proven by the authors, working with a large database.

We have measured TWAD in peri-, and postoperative ECG recordings of patients, undergoing coronary artery bypass grafting. Analysis of perioperative TWAD has shown an increased risk of adverse events in diabetics. Postoperative TWAD parameters have deteriorated proportionally in both diabetics/ non-diabetics groups indicating increased cardiac risk within the first ten postoperative days.

The ability for diabetics/non-diabetics clustering of TWAD has been proven even in case of inaccurate location of the Tend. So far this is a reasonable advantage of TWAD vs. QT-dispersion in the study of ECG repolarization.

Keywords: T-wave dispersion, QT dispersion, CABG, diabetes, coronary artery, grafting.

3. **Coronary flow velocity reserve assessment with transthoracic Doppler echocardiography**
Simova I.

Abstract
Coronary flow velocity reserve (CFVR) reflects global coronary atherosclerotic burden, endothelial function and state of the microvasculature. It could be measured using transthoracic Doppler echocardiography in a non-invasive, feasible, reliable and reproducible fashion, following a standardised protocol with different vasodilatory stimuli. CFVR measurement is a recommended complement to vasodilator stress echocardiography. It could serve as a diagnostic tool for coronary microvascular dysfunction and in the setting of epicardial coronary artery stenoses could help in identification and assessment of functional significance of coronary lesions and follow-up of patients after coronary interventions. CFVR has also a prognostic significance in different clinical situations.
Keywords: Coronary flow velocity reserve, echocardiography, non-invasive

4. **A review on electrocardiographic changes in diabetic patients**
Simova I., Christov I., Bortolan G.

Abstract:
Prevalence of diabetes mellitus (DM) is progressively increasing, contributing to a parallel increase in cardiovascular morbidity and mortality, and more than doubling the incidence of sudden cardiac death (SCD). Certain electrocardiographic (ECG) characteristics, such as alternans of the T wave (TWA), heart rate variability (HRV) and dispersion of the QT interval, have been found to be predictive of the risk of SCD. This review focuses on ECG changes that could be found in diabetics and their potential implication for SCD risk.
Keywords: Diabetes mellitus, electrocardiography, sudden cardiac death, heart rate variation, t-wave alternans.

РЕЗЮМЕТА - Публикации в чужди и в български НЕ реферирани списания с научно рецензиране или в редактирани сборници с публикации

Авторски изследователски статии

1. **Hyperuricemia and Cardiovascular Risk in The Bulgarian Population.**
   Katova TM,
   Simova I, Yotov YT, Peeva KG, Georgieva NK. Annal Card Cardio Ther: ACCT: 101. 2020; 1 (1); ACCT: 101: ACCT-101. doi: 10.39127/ACCT:1000101
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Abstract:
The increase of serum uric acid (sUA) levels over the reference values is defined as hyperuricemia. Sustained hyperuricemia is an important risk factor for cardiovascular diseases. Aims: To evaluate the prevalence of hyperuricemia by age and sex and main hyperuricemia-related comorbidities in a nationally representative sample of 1242 Bulgarian patient. To establish whether uric acid levels could be used for evaluation of metabolic status in 200 patients with heart failure (HF) by analyzing its correlations with creatinine levels, glomerular filtration rate, in-hospital diuretic dose, ejection fraction, blood glucose, during follow-up visits after hospital discharge. Results: The study found that 33.9% of patients had hyperuricemia, which makes it a very common condition in Bulgaria. 27.3% of patients of both sexes had arterial hypertension and every third patient had a high uric acid level. Hyperuricemia was present in 84% of heart failure patients with statistically significant difference depending on the presence and type of diabetes. Patients with HF and insulin-dependent diabetes had relatively highest uric acid levels. A statistically significant considerable positive correlation was established between sUA levels and creatinine, a statistically significant moderate negative correlation between sUA levels and eGFR as well as a modest, but statistically significant positive correlation between sUA levels and in-hospital diuretic dose. The increased levels of sUA are a significant risk factor for atrial fibrillation. This is the first epidemiological study of the prevalence of hyperuricemia in Bulgarian population. word numbers: 239
Keywords: Hyperuricemia, Heart failure, Arterial hypertension, Atrial fibrillation, Metabolic syndrome

2. **Диагностичен алгоритъм при транстиретинова амилоидоза с кардиомиопатия**.
   Господинова М., Кинова Е., **Симова Я.**, Йотов Й., Гарчева М., Кирова Г., Генова К., Тодорова А., Сарафов С., Търнев И., Токмакова М., Велчев В.
   Българска Кардиология 2020; 26 (2):5-20 https://journal.bgcardio.org/article/53407/

Резюме
Транстиретиновата сърдечна амилоидоза е рестриктивна кардиомиопатия (ATTR-КМП), резултат от извънклетъчно натрупване на неразтворими транстиретинови амилоидни фибрили в миокарда, има прогресиращ ход и е възможен летален изход в рамките на 2-6 години от поставяне на диагнозата. Бива два вида – наследствена и див тип. Данни от последните години показват, че дивият тип ATTP-КМП е относително

честа причина за сърдечна недостатъчност със запазена фракция на изтласкване, особено при по-възрастни мъже. В същото време в България, наследствената транстиретинова амилоидоза не е толкова рядка. Диагностицирни са пет различни патологични мутации. Най-разпространена е p.Glu89Gln, като по данни от юни 2019 г има установени 62 несвързани семейства с 117 пациенти и 72 носители. Диагнозата ATTP-КМП често се поставя със закъснение или се пропуска, а нейното ранно диагностициране е изключително важно, тъй като има одобрен медикамент (стабилизатор на транстиретина), който е по-ефикасен приложен в начален стадий на заболяването. Други медикаменти са в клинични изпитания. Диагностицирането на ATTP-КМП е процес, който изисква мултидисциплинарен подход с участието на подготвени специалисти, мултимодална образна диагностика, добре оборудвани хистопатологична и генетична лаборатории. Изграждането на експертни центрове на функционален принцип би могло да допринесе за по-ранното откриване, своевременното лечение и проследяването на пациентите с ATTP-КМП, което съответно да подобри тяхната прогноза.

Ключови думи: транстиретина амилоидоза, кардиомиопатия, диагноза, лечение