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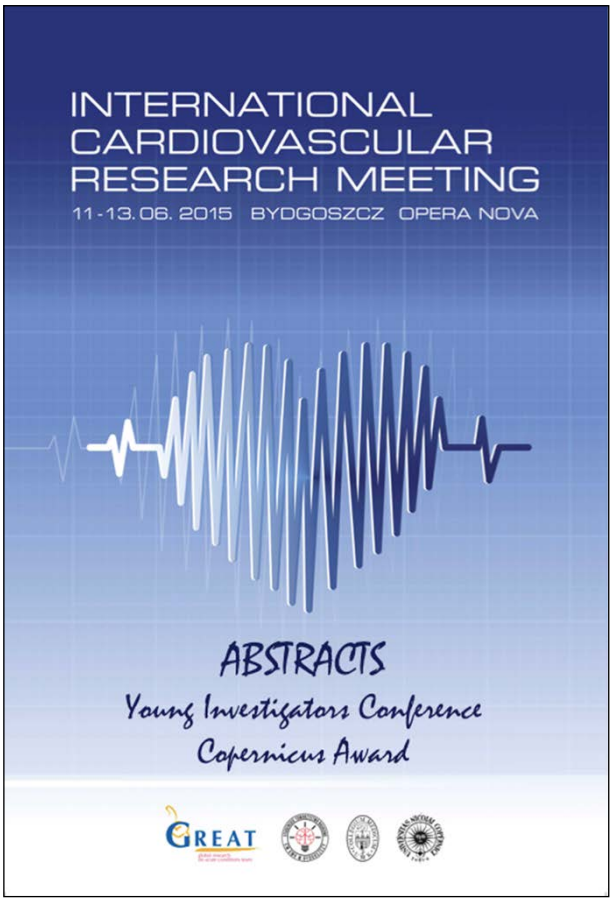
Abstracts



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Modulation of the lysine residues methylation status of histone proteins affects inflammatory response of human microvascular endothelial cells

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BACKGROUND. Changes in the chromatin structure are one of the key mechanisms in regulation of gene expression and the whole cell metabolism. Posttranslational modifications of histone aminoacid residues, e.g. acetylation, methylation, are one of pathways significantly affecting chromatin remodeling. In presented study we have focused on inflammatory response of endothelial cells (ECs), particularly on NFκB transcriptional factor, and histone methylation status of selected lysine/arginine residues.

METHODS. To figure out the role of histone methylation level in the activation process and inflammatory response of endothelial cells, a number of inhibitors of histone lysine/arginine methyltransferases as well as demethylase, have been tested. Selected parameters of the ECs activation was analyzed using Western blotting technique and Real-Time PCR. As a model human microvascular endothelial cells, HMEC-1, were used. For initiation of inflammatory response, cells were treated with lipopolisaccharide (LPS) at the concentration of 1 μg/ml or 100 ng/ml, depends on the analyzed parameter of the HMEC-1 metabolism.

RESULTS. Analysis of the p65 translocation between cytoplasm and nucleus, the NFκB subunit, performed by Western blotting technique, have shown that already 0.5 h exposure of cells to 1 μg/ml LPS, results in the significant increase of the protein in the nuclear extracts. The signal form p65 molecule was enhanced, proportionally to the extending of the incubation time. On the other hand, in the cytosol extract, in the applied range analysis (30 μg protein per lane), we have observed falling gradation of the NFκB structural element.

CONCLUSION. Treatment of cells with the compounds affecting histone methylation status due to inhibition of the methyltransferases/ /demethylases: 2-PCPA, DZNep, AMI-1, AMI-5, BIX01294, chaetocine, UNC0224; followed by stimulation of endothelial cells with 100 ng/ml LPS, have shown that some of the tested inhibitors significantly modulate inflammatory response of HMEC-1. Analysis of mRNA expression level of selected genes associated with NFκB activation: IL-6, IL-8, CCl-2, ICAM-1 revealed strong anti-inflammatory potential of 2-PCPA, an inhibitor of lysine specific demethylase-1 (LSD-1). The Real-Time PCR results were confirmed by leukocyte adhesion to the activated endothelium as well as by the analysis of the cytokine/chemokine release to the cell culture medium (protein profiler assay). Performed analysis clearly show that changes in the methylation status of H3K4, due to inhibition of lysine specific demethylase -1, significantly decrease the inflammatory response of the HMEC-1.

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Regulation of HMEC-1 cell cycle progression conditioned by G9a methyltransferase activity

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BACKGROUND. Inter-related epigenetic processes, such as DNA methylation, histone post-translational protein modifications and regulatory mechanisms of gene expression by non-coding RNA (miRNA), have a big impact on the endothelium functions. Their relationships offer new insights into controlling transcription process in vascular endothelial cells. Post-translational modification of histone proteins changes chromatin structure affecting cells metabolism as well as, more globally, whole organism functions. One of the most often modification is methylation of arginine and lysine residues of histone amino acid tails, which is catalyzed by a number of histone methylatransferases (HMTs), including G9a. G9a methyltransferase is responsible for dimethylation of H3K9, an epigenetic mark of gene silencing.

METHODS. The aim of this study was to characterize the activity profile of microvascular endothelial cells, HMEC-1, conditioned by G9A methyltransferase activity, with particular focus on the role of G9a HMTse in the regulation of the cell cycle. In the first step proliferation analysis of HMEC-1 treated with the selected G9a inhibitors was performed (resazurin reduction assay), followed by the flow cytometry analysis of cell cycle. To explain observed changes, using Real-Time PCR, we have estimated expression of genes involve in cell cycle regulation, e.g. p21, Rb, p16.

RESULTS. To determine the role of G9a methyltransferase, human microvascular endothelial cells, HMEC-1 were treated with G9a inhibitors, BIX01294, chaetocin and UNC0224, which have a different affinity for the enzyme. 72 h incubation with the epidrug have shown that inhibition of G9a HMT by BIX01294 and chaetocin is correlated with changes in proliferation of HMECs with cytotoxic effects observed at the higher

concentrations of inhibitor: for BIX01294 IC50 = 20 μM, for chaetocin IC50 = 27 nM, whereas UNC0224 at the selected range of concentrations did not affect EC's viability. Shorter treatment (24 h) with BIX01294 revealed increased expression of p21 and pRb (mRNA level, qPCR), responsible for cell cycle arrest at G0/G1 phase. Also, immunocytochemical staining showed changes in the activity of kinase Cdk1, a key player in the cell cycle regulation.

On the other hand we have found that inhibition of G9a HTM strongly affects redox homeostasis of HMECs. It is well known that reactive oxygen species in the small concentration can significantly affect cell proliferation. We have found that 12 h incubation of HMEC-1 with BIX01294 (5 - 20μM) result in decreased ROS production. Reduced production of ROS, may be a consequence of elevated gene expression level of antioxidant enzymes (catalase, superoxide dismutase).

CONCLUSION. Performed studies indicate that G9a HMT has a significant impact on the functioning of HMECs, in particular, on the cell cycle progression and redox homeostasis of vascular endothelial cells.

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The role of lysine-specific demethylase-1 (LSD-1) in the regulation of nitric oxide production of the microvascular endothelial cells

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BACKGROUND. Nitric oxide is one of the key molecules regulating the function of vascular endothelium, as well as more globally, the entire cardiovascular system and metabolism of the whole organism.

METHODS. The aim of this study was to understand the molecular/epigenetic mechanisms involved in the regulation of endothelial nitric oxide synthase (eNOS) activity conditioned by the lysine-specific demethylase-1 (LSD-1); the enzyme responsible for the mono- and di-methylation of lysine 4 of histone H3 (H3K4), residues in the literature indicated as the markers of transcriptional activation.

Tools, we have used to investigate the nitric oxide level in HMEC-1 specific, were on the one hand specific inhibitors of LSD-1: MS30, AH124, MS120 and MS137, on the other the compounds acting globally on the all monoamine oxidases: 2-PCPA and pargyline.

RESULTS. Analysis of the production of reactive nitrogen species (RNS), using DAF-FM DA probe, have shown the inhibition of the RNS production after 16 hours of incubation of HMEC-1 with the inhibitors. In case of a MS120 compound (50 μM), we have observed 50% decrease in the production of reactive nitrogen species. Apart of the MS120, also treatment of HMEC-1 with AH124 (50 μM) resulted in strong decrease of the RNS level (up to 60% in comparison to control — untreated cells), as well as MS137 — 20 μM – up to 70% of inhibition of the DAF-FM probe oxidation. The other tested LSD-1 inhibitors did no exerted statistically significant changes in NO level. In order to explain the observed reduction in the reactive oxygen species production, our analysis were moved the level of transcription analysis. Performed experiments have shown decrease in the level of expression of NOS3 after treatment of HMEC-1 with all tested inhibitors. The biggest changes were observed for inhibitors: MS120, MS137 and AH124. In addition, eNOS gene expression level was correlated with the protein level; Western blotting revealed changes in the amount of eNOS protein, in the cellular lysates after 24 hours treatment of cells with the lysine-specific demethylase-1 inhibitors.

CONCLUSION. Performed analysis revealed potential regulatory role of LSD-1 in the modulation of endothelial functions, due to limited bioavailability of nitric oxide.

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Evaluation of 2 years treament results after Biolimus A9 stents implantation in coronary arteries

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BACKGROUND. Stenting — it is a widespread procedure for patients that are suffering from coronary artery disease. Possibility to use drugs-covered stents, improved stenting safety and treatment efficiency. Using second generation Biolimus drugs-covered Stents A9 is asociated reduced risk of stent thrombosis copaired with first generation. However the posibility of stent thrombosis and restenosis as late complication still persist. In this survey we tried to evaluate 2 years treament results after Biolimus A9 stents implantation in coronary arteries.

AIM. Evaluate 2 years treatment results after Biolimus A9 stents implantation in coronary arteries for patients suffering from coronary artery disease. Evaluate the success of procedure and the rate of complications after Biolimus A9 stents implantation. Evaluate the rate of complications in hospital after Biolimus A9 stents implantation. Evaluate the rate of complications in 2 years period of time after Biolimus A9 stents implantation.

METHODS. The retrospective study performed in LSMUL KK Cardiology department. There was 216 patients suffered from coronary artery disease, and were treated using Biolimus A9 drugs-covered stents, in this way eliminating all bigger than 50 % stenosis. Data collected from hospital case histories and e-Biomatrix PMR questionnaire. The rate of complication after stenting were evaluated, when stenosis were eliminated or reduced to 30% or TIMI 3 flow were determined. We evaluated the rate of complications(myocardial infarction, Stent thrombosis, the need of revascularization, stroke, death) in 2 years period. Data was analyzed using SPSS v. 22.0 programme.
RESULTS. There were 216 patients in a survey, 69.91% men and 30.09% women. The age mean was 60.17 ± 10.13 years. Diabetes was diagnosed for 19% of patients. The success of Biolimus A9 implantation was 110%. The rate of complications after stenting was 0.93% (2 cases) There were no complication in hospital. There rate of complication during one year period was 1.4% (1 stent thrombosis, 2 new revascularizations, 1 stroke). There rate of complication during second year period was 0.46% (1 revascularization).
CONCLUSIONS. The implantation of Biolimus a9 stent is safe and effective procedure, with low-risk for complications. There was no complications in hospital. The rate of complications during 2 year period is low.

Utility of SYNTAX Score for predicting clinical outcomes after CTO-PCI

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BACKGROUND. Dealing with complex chronic total occlusions (CTOs) in patients undergoing percutaneous coronary intervention (PCI), it is important to evaluate not only the CTO lesion itself but also atherosclerotic lesions of the whole coronary artery tree.
AIM. To evaluate the utility of the SYNTAX score in patients having CTO undergoing PCI.
METHODS. This retrospective study included 72 consecutive patients with CTO lesions who underwent PCI. Primary endpoints were procedural failure and major adverse cardiac events (MACE) within 30 days. The SYNTAX and J-CTO scores were assessed before the procedures, and patients were divided into 2 groups according to SYNTAX criteria: high (> 22) and low (≤ 22).
RESULTS. Procedural success was obtained in 86.1% of patients. Patients with a high SYNTAX score had significantly lower procedural success than those with a low SYNTAX score (72.6% v. 87.8%). There were 76% MACE in patients with high SYNTAX scores and 2.2% MACE in those with low scores. Both the SYNTAX and J-CTO scores had odds ratios of 1.39 (95% CI 1.03–1.81) and 3.31 (95% CI 1.12–9.43) for procedural failure. Higher SYNTAX scores were also an independent predictor of 30-day MACE after PCI (odds ratio 1.65, 95% CI 1.54–2.26), though the J-CTO score failed to predict the development of MACE.
CONCLUSION. The SYNTAX score appeared predictive of procedural failure in patients undergoing CTO-PCI. High SYNTAX scores were strongly associated with an increased risk of 30-day MACE.

Twelve-month clinical outcomes of transradial coronary artery intervention: Comparison of the right and left radial artery approach

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BACKGROUND. The transradial intervention (TRI) has several advantages such as reduction of bleeding risk, improvement of patients' convenience, and immediate ambulation as compared with the transfemoral intervention (TFI). In TRI, there are some anatomical and technical differences between right and left radial approach.
AIM. The aim of this study is to evaluate the impact of the choice of the right or left radial approach on 12 months clinical outcomes in patients undergoing TRI.
METHODS. A total of 506 consecutive patients underwent TRI were enrolled from Nov 2013 to Oct 2014 in Lithuanian University of Health Sciences TRI Registry. The patients were divided into two groups; right radial approach group (n = 240 pts) and left radial approach group (n = 266 pts). To adjust potential confounders, propensity score matched (PSM) analysis was performed using the logistic regression model (C-statistics: 0.726). After PSM, total of 450 pts (225 pairs) were enrolled for this analysis.
RESULTS. After PSM, the baseline clinical and angiographic characteristics were balanced between two groups. However, contrast volume during procedure were larger and fluoroscopic time (20.5 ± 26.0 min v. 15.1 ± 10.6 min) were longer in right radial approach group (256.3 ± 116.6 cc v. 225.0 ± 88.7 cc, p-value < 0.001), whereas procedure time (45.2 ± 27.4 min v. 53.4 ± 25.7 min, p-value = 0.003) were longer in left approach group. After PSM, procedural and in-hospital complications were similar between the two groups. The cumulative clinical outcomes up to 12 months including mortality, recurrent myocardial infarction (MI), repeat revascularization, stent thrombosis and MACE were similar between the two groups.
CONCLUSION. In this study, despite the procedural efficacy including procedural time and contrast volume were increased in right artery approach, however, 12 months cumulative clinical outcomes were similar between the two groups.

The comparison of hybrid approach versus single crossing strategies to coronary CTO-PCI

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BACKGROUND. Most attempts to intervene on coronary chronic total occlusions fail because the wire cannot cross the occlusion. Three main strategies can be used to cross a CTO: antegrade wire escalation, antegrade dissection/re-entry and retrograde. The basic underlying principle of the hybrid approach (HA) is that no single procedural crossing strategy should be pursued to exhaustion, but an alternative strategy should be attempted if a given crossing strategy does not progress.
AIM. To evaluate the difference in success, complication rates, procedural characteristics and clinical outcomes of single CTO crossing strategies versus hybrid approach to coronary CTO-PCI.
METHODS. The success rates, complication rates, procedural characteristics and clinical outcomes of 72 consecutive CTO-PCIs with single crossing strategy (control group) were compared to 34 cases of hybrid approach to CTO-PCI. In the HA group succesful crossing strategy was assessed. The SYNTAX and J-CTO scores were assessed to evaluate the potential severity of the procedure. Procedural characteristics were evaluated by numbers of stents, wires, microcatheters, amount of dye used, total fluoroscopy time, air kerma radiation dose and total procedural time. The complications included major adverse cardiac and cerebrovascular events (MACCE) (defined as death, myocardial infarction, emergent coronary bypass surgery, repeat PCI, or stroke) and the procedural complications such as acute or sub-acute occlusion, distal embolization, coronary dissection, and coronary perforation. At 6 month follow-up clinical outcomes including target vessel revascularization (TVR), target lesions revascularization (TLR) and major adverse cardiac events (MACE) were evaluated.
RESULTS. Procedural success was achieved in 91.2% cases in HA group and was significantly higher than cases in control group (86.1% respectively). The final successful CTO crossing strategy in HA group was antegrade in 48.4%, retrograde in 29%, and antegrade dissection/reentry in 22.6%. The retrograde approach in control group was used in 45.8% cases with 87.9% procedural success. Major procedural complications occurred 2.9% and 2.8% respectively, with no statistically significant difference. Higher SYNTAX scores were also an independent predictor of MACE after PCI in both groups at 6 month follow-up.
CONCLUSION. Use of the hybrid approach to CTO-PCI is associated with higher success and similar complication rates compared to other CTOs crossing strategies. High CTO-PCI success rates can be achieved without incurring more complications, which is important for an elective procedure, such as CTO-PCI. High SYNTAX scores were strongly associated with an increased risk of early MACE after CTO-PCI, which is useful for clinical decision making in patients with complex CTO to minimize PCI-related procedural complications.

Improved medically resistant arterial hypertension dynamics in patients undergoing percutaneous renal denervation

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BACKGROUND. As well known risk factor hypertension and especially resistant hypertension needs to be treated sufficiently as soon as possible. The autonomic sympathetic activation plays a key role in controlling the mechanism of systemic hypertension and in some situations the medication do not show a fast, effective results. Percutaneous renal denervation (PRD) has proven to be an effective and safe method to treat patients with medically resistant hypertension. We used the Simplicity-Catheter-System (Ardian Inc., Palo Alto, CA, USA) as a new opportunity in the treatment of resistant hypertension by using endovascular denervation of renal sympathetic nerves method and want to report about our first experience.
AIM. To evaluate the effectives of renal denervation in patients with resistant arterial hypertension.
METHODS. 32 patients were treated with PRD between. All patients have had resistant hypertension, defined as systolic blood pressure over 160mmHg or more under treatment with at least three antihypertensive agents including one diuretic. PRD was performed in all patients by transfemoral access and in both renal arteries. As much as possible using low-power radio-frequency (RF) ablations were done. A first follow up including ambulatory blood pressure measurement (ABPM) was done three weeks after PRD and again 2 months post procedure. Patients with less than 10mmHg blood pressure reduction at office measurements were classified as non-responders.
RESULTS. Mean age of the patients was 54.2 years (70% male and 30% female). At baseline mean office blood pressure was 180.2/93.2 mm Hg and by an average use of > 3 antihypertensive agents. The ABPM mean was 155.8/89.6 mm Hg. Procedure time was about 62 minutes (mean — 53 min). 4.2 lesions per patient were done in the left renal artery and 4.5 lesions in the right renal artery. Mean ABPM of 148/86.5 mm Hg was documented three weeks after PRD (blood pressure reduction: 5.6/2.0 mm Hg). 2-months after PRD a mean ABPM of 142.5/83.5 mm Hg was measured (blood pressure reduction was 8.2/3 mm Hg) and mean office blood pressure was 154.2/80.8 mmHg. At this point of time 5 patients (20%) were classified as non-repsonders . Renal function parameters (Creatinin, calc. GFR and Cystatin C) remained stable during the follow up period.
CONCLUSION. PRD is a new potent treatment option in patients with resistant hypertension. A change in dipping classification is good predictive parameter for response to PRD.

Prediction of heart failure development by time-resolved fluorescence spectroscopy

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BACKGROUND. Collagen scar formation plays an essential role in the remodeling of cardiac tissue following myocardial infarction and in the development of heart failure as well. Therefore, markers of collagen synthesis and degradation are tested as a biomarkers to determine the extent of cardiac fibrosis. It is supremely important to distinguish patients with increased risk of left ventricular remodeling and heart failure development. The aim of the study was to confirm our findings from previous study assessing mean fluorescence lifetime of plasma in patients with left ventricular remodeling.

METHODS. The study group consisted of patients treated with primary percutaneous coronary intervention for acute myocardial infarction admitted to the Department of Cardiology and Internal Medicine at the University Hospital in Bydgoszcz. The overall group comprised of 65 patients. From each patient 8 mL of blood was taken to obtain plasma that was used for further examination. The time-resolved spectrometer Life Spec II with the sub-nanosecond pulsed 360 nm EPLED diode was used in order to measure fluorescence lifetime of samples.

RESULTS. The analysis showed that brain natriuretic peptide concentrations were significantly higher in patients with lower left ventricular ejection fraction. Statistical analysis showed that the increase of brain natriuretic peptide level is an independent factor resulting in the decrease in mean fluorescence lifetime.

CONCLUSION. It seems that plasma concentration of collagen degradation products is closely related to brain natriuretic peptide level. However, this experiment confirmed that plasma of patients with potential high probability of developing left ventricular remodeling has a decreased mean fluorescence lifetime.

Fluorescence spectroscopy in determination of left ventricular remodeling using *in vitro* model of collagen degradation products

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BACKGROUND. The myocardium contains an extensive network of extracellular matrix, including collagens type I and III. The concentration of collagen degradation products may reflect the process of left ventricular remodeling, which may develop after myocardial infarction. The aim of this study was to evaluate potential diagnostic usefulness of fluorescence spectroscopy in assessment of collagen degradation products.

METHODS. The *in vitro* model of collagen degradation products was created using collagen type III from human placenta (Sigma-Aldrich). In order to measure fluorescence lifetime of samples, the time-resolved spectrometer Life Spec II (Edinburgh Instruments Ltd) with the sub-nanosecond pulsed EPLED diode emitting a light of the wavelength $\lambda = 360$ nm was used. The spectrometer was equipped with all the electronic modules required for TCSPC. The MATLAB was used for data analysis and visualization.

RESULTS. The obtained results showed that the increase of added plasma to hydrolyzed collagen extend the mean fluorescence lifetime. The visible fluorescence signal from hydrolyzed collagen was observed, when small amount of added plasma was used.

CONCLUSION. The results suggest that it is highly likely to detect collagen degradation products in plasma, if interfering proteins are eliminated. Differences between mean fluorescence lifetime from consecutive steps of hydrolysis suggest that it will be possible to determine the degree of collagen degradation. However, it is important to point out the experiment was preliminary and further investigation in this field of research is crucial.

"Vulnerable plaque" versus "vulnerable patient" conundrum. Natural history of coronary vulnerable plaques

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BACKGROUND. Vulnerable plaques are responsible for occurrence of acute coronary syndromes (ACS). However, due to difficulties in their investigation and insidious development, their prevalence and natural history remain poorly recognized. Computed tomography angiography (CTA) allows non-invasive, serial imaging of the whole coronary vasculature. Importantly, it allows identification of so called "napkin ring sign" (NRS), specifically corresponding to vulnerable plaque (VP). Presence of NRS was correlated to occurrence of ACS.

AIM. The aim of this study was to evaluate the prevalence and evolution of vulnerable plaques in patients undergoing CTA due to suspected coronary artery disease (CAD).

METHODS. From 9000 coronary CTA studies (dual source 2 × 128, Siemens — Somatom Definition Flash) performed in Institute of Cardiology within July 2011–January 2015, we chose 89 consecutive patients (56 male, mean age 64.2 ± 11.8 y) with repeated CTA examinations, performed ≥ 24 months apart for clinical indications. NRS was defined as the presence of a lower attenuation ring adjacent to coronary lumen, with the external ring of higher attenuation. All the baseline and follow-up CTA examinations were reviewed with the reader unaware of the identity nor sequence of the studies. The primary outcome — NRS progression, was defined per pt, as more NRSs present on the follow-up than the baseline examination.

RESULTS. There were 53 NRS observed in 22 (24.8%) of 89 patients at the baseline, including 7 patients with single NRS, and 15 patients with multiple NRS. Patients with multiple NRS had lower HDL (1.5 ± 0.2 vs 1.2 ± 0.0, $p = 0.010$), and more often history of ACS and diabetes (respectively 4/15 v. 5/74, and 5/15 v. 13/74, $p < 0.05$ for both). Number of NRS correlated also with the number of significant coronary stenoses above 50% ($p < 0.001$). Following the mean 34 ± 9 months of follow-up, there were 66 NRS observed in 30 patients ($p = 0.037$ for increased proportion of patients with NRS, McNemar test). In 18 patients progression was observed with 23 new NRS. In 5 patients regression was observed with 8 less NRS. In COX regression, after correction for statin treatment between the two CTAs, number of significant coronary stenoses, and HDL, only diabetes (HR 3.6; 95%CI 1.4–9.6) and presence of single NRS (HR 8.3; 95%CI 2.2–31.2), were independent predictors of NRS progression. 10 of 22 patients with either NRS or diabetes had progression as compared to 8 of 67 remaining patients ($p < 0.001$, KM, figure). No clinical variables predicting NRS regression were found.

CONCLUSION. Number of patients carrying vulnerable plaques increases over time, however in some patients NRS regress. Occurrence of new vulnerable plaques may be predicted by the clinical and CTA characteristics, which may indicate patients suitable for extremely aggressive preventive therapies.

Variability of prasugrel antiplatelet activity

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BACKGROUND. Prasugrel is an antiplatelet drug acting through irreversible inhibition of P2Y12 receptor. The main indication for prasugrel is acute coronary syndrome. Efficient and stable platelets inhibition determines the success of treating a patient with ACS. The study evaluated the hourly and daily variability of antiplatelet activity of prasugrel.

METHODS. 42 patients hospitalized in the Department of Cardiology becouse of ACS, treated with percutaneous coronary intervention, were included to the study. Patients were treated with standard doses of prasugrel. To assess the platelets activity Verify Now analyzer was used. In the "0" day of hospitalization patients received a loading dose of prasugrel (60 mg), in the subsequent days of hospitalization, at 8:00 they received 10 mg of prasugrel. Measurements of platelet activity were made on the 3rd day (at 8:10 and 15:00) and on the 4th day at 8:10.

RESULTS. All patients participating in the study were successfully treated with P2Y12 antagonist during hospitalization period (PRU was less than 208 PRU).

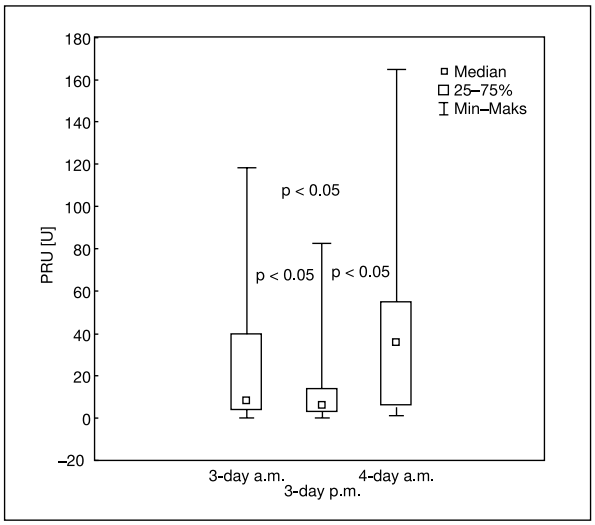

Figure 1. Platelet inhibition in each measurement (Variability of prasugrel antiplatelet activity, Molska MA, Kasprzak M, Buszko K)

Table 1. Correlation analysis between measurements

	Spearman's rank order correlation		
	3r-PRU[U]	**3p-PRU[U]**	**4r-PRU[U]**
3r-PRU [U]	1,000000	**0,575278**	**0,679714**
3p-PRU [U]	**0,575278**	1,000000	**0,717138**
4r-PRU [U]	**0,679714**	**0,717138**	1,000000

In 31 patient (74%), the average PRU measurement is getting lower (from first measurement to third). In contrast in11 patients (26%), average PRU measurement increases from first measurement to third measurement.

CONCLUSIONS. 1) Prasugrel is an effective antiplatelet drug — proper platelet inhibition was observed in all made measurements. 2) Stronger inhibition of platelet aggregation ability was observed 6 hours after administration of maintenance doses of prasugrel compared to inhibition of platelet activity occurring just before next dose. 3) There was a large variation in the daily and hourly capacity of platelets aggregation. 4) Observed in the 4th day of hospitalization decline PRU values, hypothetically may be the result of regretion activity of loading dose of prasugrel and other antiplatelets drug used in the "0" day of ACS.

Platelet reactivity after the loading dose of ticagrelor in patients with non-ST-elevation myocardial infarction and ST-elevation myocardial infarction: A subanalysis of the impression study

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BACKGROUND. Ticagrelor is a novel platelet P2Y12 receptor blocker, which is recommended in patients with ST-segment elevation myocardial infarction (STEMI) and in all moderate-to-high risk patients with non-ST-elevation myocardial infarction (NSTEMI), regardless of the initial treatment strategy. Ticagrelor is known of its rapid, potent and uniform antiplatelet activity, however its pharmacodynamic profile may differ between STEMI and NSTEMI patients. The IMPRESSION study is an ongoing trial, which has been designed to determine the influence of morphine on pharmacokinetics (PK) and pharmacodynamics (PD) of ticagrelor in patients with acute myocardial infarction (AMI). The current interim analysis of the study aims to assess the differences in platelet inhibition between STEMI and NSTEMI patients during the initial period of treatment with ticagrelor.

METHODS. The IMPRESSION study is a phase IV, single center, randomized, double-blind, placebo-controlled clinical trial. Patients enrolled to the study were randomly assigned in a 1:1 ratio to the intervention arm or to the control arm. Patients in the first group prior to the LD of ticagrelor (180 mg) received morphine (5 mg) intravenously, while patients in the latter group received placebo prior to the LD of ticagrelor (180 mg). The current analysis consists only of patients who were randomized to the control arm (n = 31). Patients who were randomized to the active arm, thus received morphine prior to the LD of ticagrelor, are not included in this analysis, as morphine may affect the PK, and subsequently the PD of ticagrelor. Platelet reactivity of STEMI (n = 18) and NSTEMI (n = 13) patients was assessed by platelet vasodilator-stimulated phosphoprotein (VASP) assay at pre-treatment, 30, 60 and 120 minutes after the LD of ticagrelor.

RESULTS. At submission, patients with NSTEMI had greater mean platelet reactivity index (PRI) compared with STEMI patients, but this difference was not significant (83.2% ± 14.0% v. 87.4% ± 9.9%; p = 0.6). During the initial two hours after the LD of ticagrelor, mean PRI was significantly greater in STEMI compared with NSTEMI patients (at 30 minutes post-LD 78.7% ± 16.6% v. 50.5% ± 27.2%, p = 0.002; at 60 minutes post-LD 65.9% ± 29.3% v. 28.4% ± 14.6%, p = 0.022; at 120 minutes post-LD 50.2% ± 32.1% v. 24.9% ± 14.4%, p = 0.037).

CONCLUSION. In the initial two hours of treatment, ticagrelor provides more robust antiplatelet effect in NSTEMI patients, than in STEMI patients. Timely platelet inhibition is of vast importance in subjects presenting with AMI, especially in those who are undergoing a percutaneous coronary intervention, as high platelet reactivity may increase the risk of thrombotic adverse events. Less pronounced platelet inhibition observed in STEMI patients may be a result of more severe impairment of the intestinal drug absorption in this population, however the whole underlying mechanism may be more complex and needs to be elucidated by the further studies.

Influence of morphine on the intestinal absorption of ticagrelor in patients with non-ST-elevation myocardial infarction: A subanalysis of the impression study

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BACKGROUND. Ticagrelor is an oral platelet P2Y12 receptor antagonist which is recommended in patients with acute myocardial infarction (AMI), including patients with ST-segment elevation myocardial infarction (STEMI) and in all moderate-to-high risk patients with non-ST-elevation myocardial infarction (NSTEMI), regardless of the initial treatment strategy. Morphine is the first choice drug in pain alleviation in the same clinical subsets. There is a growing body of evidence suggesting a possible negative influence of morphine on the pharmacokinetics (PK) of orally administered P2Y12 receptor blockers in patients with AMI. The IMPRESSION study is an ongoing trial, which has been designed to test the hypothesis that intravenous administration of morphine prior to the loading dose (LD) of ticagrelor in patients with AMI, alters the plasma concentration of ticagrelor.

METHODS. The IMPRESSION study is a phase IV, single center, randomized, double-blind, placebo-controlled clinical trial designed to evaluate the influence of morphine on the PK of ticagrelor in patients with myocardial infarction, both STEMI and NSTEMI. The current subanalysis includes initial fourteen NSTEMI patients enrolled to the IMPRESSION study. Patients were randomly assigned in a 1:1 ratio to one of two study arms. Subjects in the intervention arm (n = 7) prior to the LD of ticagrelor (180 mg) received morphine (5 mg) intravenously, whereas patients

in the control arm (n = 7) received placebo prior to the LD of ticagrelor (180 mg). Blood samples were obtained at eight pre-defined time points (pre-treatment, 30 min, 1 h, 2 h, 3 h, 4 h, 6 h and 12 h after ticagrelor LD). The PK of ticagrelor was assessed by liquid chromatography mass spectrometry.

RESULTS. Mean area under the curve for ticagrelor for the first twelve hours after the LD (AUC0-12) was significantly lower in patients who received morphine prior to the LD of ticagrelor, than in patients who received placebo prior to administration of ticagrelor LD (9265 ± 4607 and 14884 ± 4355 ng·h/ml respectively, p = 0.037). The altering effect of morphine was even more profound during the first 6 hours (AUC0-6 was 4779 ± 2091 in patients who received morphine prior to the LD of ticagrelor and 9573 ± 1698 ng·h/ml in patients who received placebo prior to the LD of ticagrelor, p = 0.001).

CONCLUSION. The intestinal absorption of the LD of ticagrelor in patients with NSTEMI is significantly disrupted by the prior administration of morphine. Decreased exposure to ticagrelor in the initial period of treatment in NSTEMI patients can lead to insufficient platelet inhibition and increased risk of adverse thrombotic events. Further studies should be warranted to assess the clinical significance of the observed influence of morphine on the PK of ticagrelor in NSTEMI patients. Such verification could increase the safety of concomitant use of these compounds.

Identification of stem cell-derived cardiomyocytes by using cardiac specific markers: vascular cell adhesion molecule type 1 and troponin I

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BACKGROUND. Embryonic stem cell (ESC) - derived cardiomyocytes are suitable cell source for the study of cardiac cellular physiology, pathophysiology, as well as for pharmaceutical investigations. However, the precise identification of these cells is mandatory in order to acquire a high purity and number of cardiomyocytes. In this project, we aimed to identify cardiomyocytes derived from ESCs via detection of the cell surface antigen vascular cell adhesion molecule type 1 (VCAM-1) and intracellular specific marker cardiac troponin I (cTnI).

METHODS. Mouse embryonic bodies (EBs) were seeded onto gelatin coated surface and were kept in growth medium under normoxic conditions (at 37°C, 5% CO_2) for 8–16 days. EBs were dissociated and cells were labeled with intracellular cTnI and temporally expressed surface VCAM-1 antibodies. Concomitantly, the isolation of premature hearts from 12.5 days old mouse embryos was performed in order to validate the co-expression of the same cardiac markers.

RESULTS. All dissociation procedures were greatly effective as detectable single cell ratio ranged between 84–98% by flow cytometry analysis. The intracellular antigen cTnI was remarkably expressed in both 8th and 16th day, being the highest expression registered on the 8th day (75.31%). However, the highest expression of VCAM-1 antigen was seen rather on the 16th day (41.76%).

As for the in vivo validation of VCAM-1 expression in embryonic mouse heart, 52.20% of cells showed VCAM-1 positivity by flow cytometry analysis.

CONCLUSIONS. We successfully identified mouse ESC-derived cardiomyocytes in a mixed culture. Identification of ESC-derived cardiomyocytes by the cell surface antigen VCAM-1 gives us the possibility to test the hypoxic tolerance of these cells and to develop a drug screening platform using induced pluripotent stem cell-derived cardiomyocytes.

Differences in mitral annulus remodeling in acute anterior ST elevation and acute inferior ST elevation myocardial infarction

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BACKGROUND. Myocardial infarction is known to account for left ventricular remodeling and mitral annular distortion. Aim of this study was to assess and compare morphometric changes of mitral annulus in patients presenting with acute anterior or inferior myocardial infarction. Objectives of study: 1) To assess anteroposterior and septolateral annular dimension of mitral annulus in patients with acute MI. 2) To assess mitral annular area and annular contraction in patients with acute MI. 3) To evaluate parameters reflecting mitral apparatus (chordal length, chordal papillary muscle distance, etc. 4) To compare differences in mitral annular geometry between patients with anterior and inferior MI.

METHODS. Echocardiographical data of 30 patients with an anterior ST elevation myocardial infarction and data of 30 patients with an inferior ST elevation myocardial infarction on an acute stage was collected, evaluated and compared. Parameters used: 1) Mitral annulus parameters: mitral annulus systole and diastole, systolic and diastolic annular area, annular contraction. 2) Mitral valve muscle parameters: distance from anterolateral muscle to anterior leaflet, distance from anterolateral muscle to posterior leaflet, perpendicular of anterolateral muscle to mitral annulus. Parameters were measured on 4 chamber and parasternal long axis views of the heart. Data was collected using EchoPAC software to measure mitral annulus. Collected data was analyzed and compared to acute posterior wall myocardial infarction data using SPSS (calculating mean and using Wilcoxon criteria).

RESULTS. Four chamber view (anterior MI v. inferior MI)(written values show size in millimeters): Mitral annulus (MA) diastole: 32.573–39.089 mm (p = 0.000) (size of mitral annulus in diastole is smaller in patients with anterior MI), MA systole: 30.935–36.223 mm (p = 0.000) (size of mitral

annulus in systole is smaller in patients with anterior MI), MA diastolic area: 8.335–12.115 mm^2 ($p = 0.000$) (size of MA diastolic area is smaller in patients with anterior MI), MA systolic area: 7.577–10.146 mm^2 ($p = 0.001$) (size of MA systolic area is smaller in patients with anterior MI), MA contraction: 0.835–1.698 ($p = 0.000$) (MA contraction is weaker in patients with anterior MI). Parasternal view (anterior MI v. inferior MI): MA diastole: 33.558–36.008 mm ($p = 0.003$) (size of mitral annulus in diastole is smaller in patients with anterior MI) , MA systole: 31.182–34.052 mm ($p = 0.005$) (size of mitral annulus in systole is smaller in patients with anterior MI), MA diastolic area: 8.876–10.136 mm^2 ($p = 0.003$) (size of MA diastolic area is smaller in patients with anterior MI), MA systolic area 7.662–9.273 mm^2 ($p = 0.004$) (size of MA systolic area is smaller in patients with anterior MI) , MA contraction 1.214–1.040 ($p = 0.153$) (MA contraction is stronger in patients with anterior MI than in patients with inferior MI).

CONCLUSION. Inferior myocardial infarction accounts for early mitral annular dilatation compared to patients with anterior myocardial infarction.

Relationship between usual sleep duration and blood pressure

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BAGROUND. The prevalence of hypertension has increased over the past decade despite improvements in treatment. An effect of short sleep duration on hypertension might increase the risk of cardiovascular disease (CVD). There is a need to evaluate the relationship between average sleep duration and blood pressure, cardiovascular diseases among adults.

METHODS. There were distributed 87 anonymous questionnaires containing 20 questions and performed three seated measurments of blood pressure (at 5-minute intervals) to patients who visit CD of LUHS during 02–03.2015. Usual sleep duration on weekdays and weekends were defined as the response to the questions "How many hours of sleep do you usually get at night on weekdays (workdays) or on weekends?". The questionnaire included questions as medical history of CDV (angina, myocardial infartion (MI), heart failure (HF) or coronary revascularization procedures).

RESULTS. 87 patients (57.5% men, 42.5% women) were divided into 4 age categories: < 60 years old — 31%; of 60–69 — 36.8%; of 70–79 — 19.5%; ≥ 80 — 12.6%. A usual weekday sleep duration < 7 h per night (h) was reported by 54% subjects, including 13.8% sleeping <6 h ≥ 8 h was reported by 13.8% subjects, including 4.6% sleeping > 9 h. Sleeping of 7–8 h was reported by 32.2% subjects. A usual weekends sleep duration < 6 h was reported by 4.6%; 6–7 h — 23%; 7–8 h — 33.3%; 8–9 h — 29.9%; > 9 h — 9.2%. Arterial hypertension (AH) were detected by measuring blood pressure to 46% patients. AH: stage I had 10.3%, stage II — 8.0% and isolated systolic — 27.6%. 32 subjects (60–69 years old) had SBP 143.54 ± 16.5 (mean ± SD) and DBP 78.38 ± 11.57 mm Hg. 17 subjects (70–79 years old) had SBP 147.42 ± 21.06 and DBP 80.02 ± 11.09 mm Hg and 11 subjects ≥ 80 years old had SBP 151.33 ± 12.82 and DBP 81.36 ± 10.18 mm Hg. Usually sleep duration < 7 h on weekends and AH had 20.6%, 7–8 h and AH had 12.6% of subjects. Compared with sleep 7–8 h, self-reported usual sleep duration < 7 h were associated with AH ($p = 0.038$). Of all 13 subjects who sleep < 6 h are more likely not to have HF ($p = 0.039$). Of 7 subjects who sleep 8–9 h 57.1% of them are more likely to have HF ($p = 0.018$). Of 7 subjects who sleep 8–9 h 71.4% of them are more likely to have MI ($p = 0.001$). There was not found significant difference between sex and age across sleep-duration categories.

CONCLUSIONS. The prediction that short sleep duration on weekdays could be a risk factor to develop AH has been not proved. But there was found a link that subjects who sleep < 7 h on weekends are more likely to have AH. Those who sleep 8–9 h are more likely to have HF and MI.

Treatment of severe mitral regurgitation with MitaClip system — results from a single center study

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BACKGROUND. Mitral regurgitation (MR) may be caused mainly by degenerative changes of the valvular apparatus or functional changes in the course of ischemic heart disease or cardiomyopathy. Incidence of MR increases with age and due to aging of general population it becomes serious clinical problem. Elderly patients with MR are at high or prohibitive surgical risk caused by advanced age, the presence of comorbidities or impaired LV function.

MitraClip (MC) is a percutaneous, catheter-based device designed to perform edge-to-edge reconstruction. This method is based on the creation of a mitral double orifice by suturing of the anterior and posterior MV leaflets. MC maintains closer apposition of leaflets during systole, thereby reducing the amount of regurgitation. The MC technique has evolved into a therapeutic alternative for patient with significant MR, whose surgical risk is considered prohibitive.

AIM. Aim of the study was to access the usefulness and effectiveness of treatment with MitraClip device in patients with mitral regurgitation.

METHODS. We conducted a retrospective single centre study and enrolled patients hospitalized at the First Cardiology Department, CM UMK in Bydgoszcz diagnosed with severe mitral regurgitation and treated by performing MitraClip system in the time period from August 2010 to December 2014. We analyzed following data from medical history: NYHA class, Left Ventricular Ejection Fraction (LVEF) and mitral regurgitation severity, before, right after and 43 ± 25 days after the procedure. Statistical analysis was performed using Statistica 12 (StatSoft).

RESULTS. Studied group consisted of 11 patients — 8 males, 3 females, aged 64.4 (± 10.2), treated with MitraClip, 6 with 2 clips, 5 with one clip implanted. All 3 analyzed parameters improved relevantly as a result of evaluated procedure.

Percentage of patients classified as NYHA class III/IV present as follows:

Before procedure	90%
After MitraClip implantation	55% (ns)
At control examination	44% (p = 0.01)

Percentage of patients with severe-to-moderate and severe MR (3+/4+) v. mild-to-moderate or lower (≤ 2+):

Before procedure	100% / 0%
After MitraClip implantation	9% / 91% (ns)
At control examination	18% / 82% (p = 0.0005)

Significant LVEF growth was observed:

Before procedure	27.9 ± 2%
After MitraClip implantation	29.6 ± 2% (ns)
At control examination	34 ± 7% (p = 0.02)

CONCLUSION. Percutaneous edge-to-edge mitral valve regurgitation treatment with MitraClip system is an effective strategy in patients with severe mitral regurgitation, numerous comorbidities and impaired left ventricular function. Despite low number of patients our Department has the largest experience in this field in Poland and achieved results are comparable with those demonstrated in other worldwide studies. MitraClip therapy improves patient's NYHA functional class, LVEF and decreases mitral regurgitation severity. Further investigation, especially randomized, prospective trails are needed.

Percutaneous left atrial appendage occlusion for stroke prevention in patients with atrial fibrillation: Impact of the appendage size estimated by the WATCHMAN device size on the duration of the procedure

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BACKGROUND. Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia. It may lead to many thromboembolic complications including ischaemic stroke which is a major cause of disability and mortality in AF patients. Left atrial appendage (LAA) is considered to be the main source of embolic material. Oral anticoagulation (OAC) is a standard medical therapy for ischaemic stroke prevention. However, chronic drug management is contraindicated in some of the patients with AF. Therefore, percutaneous LAA occlusion has been introduced as a possible alternative to drug therapy. The PROTECT AF trial demonstrated that LAA closure with the WATCHMAN device (Boston Scientific, Natick, Massachusetts) was noninferior to oral anticoagulation with warfarin. The device is available in five different sizes selected on the basis of LAA dimensions. The selection of appropriate device size for implantation is a major factor for successful intervention. The aim of this study is to evaluate the impact of the WATCHMAN device size on the duration of the procedure.

METHODS. Forty-three patients (13 female, 30 male; average age 70.98 ± 10.69) who underwent LAA occlusion in our Cardiology Department at University Hospital No 1 in Bydgoszcz, Poland were studied. All device implantations were performed by one operator using the WATCHMAN device. The indication for LAA occlusion was a formal contraindication for oral anticoagulation. The implanted WATCHMAN device size was determined using transesophageal echocardiography and ranged from 21 mm to 33 mm. The duration of the procedure was evaluated on the basis of procedure time (PT), fluoroscopy time (FT) and contrast volume (CV). The influence of the device size on the total procedure duration was statistically analyzed.

RESULTS.

Procedure time

Average PT:	71.86 min ± 31.77
21 mm device average PT:	80 min ± 45.09
24 mm device average PT:	73.58 min ± 30.13
27 mm device average PT:	59.47 min ± 22.63
30 mm device average PT:	88.33 min ± 38.97
33 mm device average PT:	66.67 min ± 30.55
	r = (–0.17); p = 0.79

Fluoroscopy time

Average PT:	13.95 min ± 7.56
21 mm device average FT:	17.31 min ± 10.46
24 mm device average FT:	13.19 min ± 8.74
27 mm device average FT:	12.01 min ± 4.72
30 mm device average FT:	17.5 min ± 9.18
33 mm device average FT:	11.36 min ± 0.49
	r = (–0.41); p = 0.49

Contrast volume

Average CV:	104.19 ml ± 66.07
21 mm device average CV:	111 ml ± 54.29
24 mm device average CV:	94.25 ml ± 70.39
27 mm device average CV:	103.33 ml ± 83.14
30 mm device average CV:	115 ml ±36.17
33 mm device average CV:	106.67 ml ± 19.29
	r = (0.24); p = 0.43

The association between device size and procedure time, fluoroscopy time and contrast volume was not statistically significant.

CONCLUSIONS. The size of the WATCHMAN device does not determine the total duration of the LAA occlusion procedure. However, influence may be present within other parameters of the anatomical shape of the left atrial appendage.

Percutaneous left atrial appendage closure for thromboembolic prophylaxis in patients with atrial fibrillation: Does operator experience determine the duration of the procedure?

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BACKGROUND. Atrial fibrillation (AF) may lead to thrombus formation and possible thromboembolic complications. The estimated ischemic stroke risk in patients with AF is 5% per year. Left atrial appendage (LAA) is believed to be the main source of blood clots in patients with AF. There are several pharmacological antithrombotic possibilities such as warfarin and the novel oral anticoagulants. However, some patients with contraindications to such drugs cannot be offered any of them. LAA closure represents an alternative strategy for thromboembolic prophylaxis in these patients. The PROTECT AF trial demonstrated that LAA closure with the WATCHMAN™ device (Boston Scientific, Natick, Massachusetts) was noninferior to warfarin therapy. Nevertheless, it is associated with numerous periprocedural complications which correlate with the duration of the procedure. This study was conducted to determine whether the duration of percutaneous LAA closure is associated with operator experience.

METHODS. This retrospective single-center study examined LAA percutaneous closures in 43 patients (13 female, 30 male; average age 70.98 ± 10.69) performed in our Cardiology Department at University Hospital No 1 in Bydgoszcz, Poland between 06/2013 and 03/2015, listed chronologically. All device implantations were performed by one operator using the WATCHMAN™ device. The indication for LAA closure was a formal contraindication for oral anticoagulation. The duration of the procedure was evaluated on the basis of procedure time (PT), fluoroscopy time (FT) and contrast volume (CV). For the purposes of this study it was assumed that the number of the procedure corresponds to the increasing operator experience. We compared the first 22 WATCHMAN™ device implantation procedures (first group) with the subsequent 21 procedures (second group).

RESULTS. We found decreasing trends in PT, FT and CV with the increasing operator experience.

Procedure time

Overall average PT:	71.86 min ± 31.77
First group of the procedures average time:	83.41 min ± 36.49
Second group of the procedures average time:	59.76 min ± 21.70
Reduced by:	28%
	r = (–0.41); p = 0.006

Fluoroscopy time

Overall average FT:	13.96 min ± 7.57
First group of the procedures average time:	16.59 min ± 7.25
Second group of the procedures average time:	11.2 min ± 7.21
Reduced by:	33%
	r = (–0.35); p = 0.019

Contrast volume

Overall average CV:	104.19 ml ± 66.07
First group of the procedures average time:	129.14 ml ± 79.81
Second group of the procedures average time:	78.05 ml ± 33.82
Reduced by:	40%
	r = (–0.43); p = 0.004

CONCLUSIONS. The operator experience in LAA closure influenced the duration of the procedure. We noticed a statistically significant trend towards reduction of procedure time, fluoroscopy time and contrast volume dependent on acquired training level.

Have indications for percutaneous left atrial appendage closure changed over the last two years? Analysis of indications and contraindications change

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BACKGROUND. Atrial fibrillation (AF), the most common cardiac arrhythmia, confers a 5-fold risk of stroke. More than 90% of thrombi were found in the left atrial appendage (LAA). Nowadays, the most effective long-term solution to protect patients from stroke and thromboembolism is oral anticoagulation therapy, either with vitamin K antagonists (VKAs) or novel oral anticoagulants (NOAC). However, there are several obstacles to long-term OAC therapy, including the risk of serious bleeding, drug–drug interactions and the need for frequent blood testing. Percutaneous left atrial appendage (LAA) closure is an evolving therapy, which should be taken into consideration in those patients with non-valvular AF with a high thromboembolic complications risk and contraindications for OAC. The aim of this study was to verify whether the profile of patients eligible for Watchman occluder implantation changes with increasing experience in performing this method.

METHODS. We conducted a single center, retrospective study. The LAA closure was performed in 43 patients (13 females, 30 males, average age 71± 10.7) with comparative or absolute contraindications for oral anticoagulation. The WATCHMAN™ device was used in all patients. 100% of occluder implantations were performed by one operator. For the purposes of this study it was assumed that the number of the procedure corresponds to the increasing experience of our department in this method. We compared the first 22 WATCHMAN™ device implantation procedures (first group) with the subsequent 21 procedures (second group). We analysed the factors such as: absolute and comparative contraindications for warfin, amount of received points in scales: CHADS, CHADS-Vasc and HAS-BLED, AF during the hospitalization, heart failure, valve defect and amount of factor risk.

RESULTS. Absolute contraindications for warifn: I grup 33.3% II group 18.2% and relative contraindications for warifn: I group 66.7%, II group 81.8% (ns), CHADS scale: 0 point — I group 0%, II group 4.5%, 1 point — I group 4.8%, II group 18.2%, 2 points — I group 38.1%, II group 27.3%, 3 points — I group 23.8%, II group 22.7%, 4 points — I group 14.3%, II group — 18.2%, 5 points — I group 9.5%, II group 4.5%, 6 points — I group 9.5%, II group 4.5% (ns, average = 3.95 I group and 3.48 II group).

CHADS-Vasc scale: 0 point — I group 0%, II group 4.5%, 1 point — I group 0%, II group 0%, 2 points — I group 4.8%, II group 9.1%, 3 points — I group 38.1 %, II group 22.7%, 4 points — I group 19.1%, II group — 18.2%, 5 points — I group 14.3%, II group 22.7%, 6 points — I group 4.8%, II group 9.1%, 7 points — I group 19.1%, II group 4.6%, 8 points — I group 0%, II group 9.5% (ns, average = 5.09 in I and II group).

HAS-BLED scale: 0 point — I group 0%, II group 4.5%, 1 point — I group 9.5%, II group 4.6%, 2 points — I group 23.8%, II group 27.3%, 3 points — I group 42.9%, II group 31.8%, 4 points — I group 23.8%, II group — 22.7%, 5 points— I group 0%, II group 9.1%, (ns, average = 3.64in both groups).

AF during the hospitalization: I group 66.7%, II group 72.7% (ns).

Heart failure: I group 57.1%, II group 45.5%, NYHA I — I group 0%, II group%, NYHA II — I group 75%, group II 90%, NYHA II/III — group I 8.33, II group 10%, NYHA III — group I 16.7%, group II — 0%, NYHA IV — group I 0%, group II 0% (ns, average = group I 2.25; group II 2.1).

Valve defect: group I 52.4%, group II 81.8% ($p = 0.11$).

More than one risk factor: in both group 100%.

CONCLUSION. Despite the growing experience in WATCHMAN™ device implantation in our department, we did not observe changes in the profile of patients eligible for this method.

Effect of high blood pressure on Serkins test parameters in students with endothelial dysfunction

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BACKGROUND. Hypertension is unfavorable hemodynamic and the risk factor of myocardial infarction, stroke, and the most common cause of morbidity and mortality. The purpose of the study was to investigate the effect of high blood pressure (BP) on the Serkins tests in students with endothelial dysfunction (ED).

METHODS. The studies were conducted in 39 male students aged 20–21 years. The effect of increase in systolic blood pressure (BP) to 140 mm Hg (n = 10), as well as its combination with ED (n = 7) on Serkins tests parameters. The investigation of the vascular endothelium was performed rheographycally by the test with reactive hyperemia.

Students determine the duration of breath holding at inspiration — the 1st phase Serkins test, duration of breath holding immediately after 20 squats (2nd phase) and breath-holding duration after 1 minute of rest (third phase). Reduction of these indicators with less than 20–25 s in the 1st phase, less than 30% — in the 2nd phase and less than 70% in the 3rd phase suggests hidden circulatory insufficiency.

RESULTS. Students with BP to 140 mm Hg noted a shortening of the 1st phase to 43.8 ± 8.8 s (59 s ± 3.9, $p < 0.05$), the 2nd phase — to 16.1 ± 2.4 s (36.5 ± 5.5%), the 3rd phase — up to 26.9 ± 2.7 s (61.7 ± 2.6%) — from the 1st phase is more than at students with BP 120 mm Hg (24 ± 1.9 s or 40.7 ± 2.4% in the 2nd phase and in a 3rd phase to 43 ± 3.6 s or 72.8 ± 4.4%. Combination increase BP to 140 mm Hg with DE accompanied with shortening of Serkins tests: in the 1st phase — to 39.8 ± 3.8 s, the 2nd phase — to 12 ± 2.4 s (30.4 ± 5.5%), $p < 0.05$, the 3rd phase — to 22.9 ± 5.7 s (57.5 ± 2.6%), $p < 0.05$ of the 1st phase duration.

CONCLUSIONS. DE helped to reduce the duration of breath holding in all phases of the Serkins test students with high blood pressure and needs the correction of the DE and elimination of risk factors for ED and arterial hypertension, as a factor of heart failure.

Outcomes of mitral valve surgery for mitral stenosis

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BACKGROUND. Mitral valve replacement procedures with either a bioprosthetic or a mechanical valve are used to treat mitral stenosis. This study aimed to evaluate the outcomes of these two procedures.

METHODS. A retrospective cohort study was performed on prospectively collected data involving a total of 195 mitral stenosis patients who have undergone mitral valve replacement with either bioprosthetic (n = 50) or mechanical (n = 145) valves in our institute from 1999 to 2012. Data were analyzed for early and late mortality, NYHA functional classes, pre- and post-operative echocardiographic findings, early and late valve-related complications, and survival. Chi Square test, logistic regression, Kaplan Meier curve, and dependent proportions tests were some of the tests employed in the analysis.

RESULTS. Out of 195 patients, 104 (53%) patients could be reached by telephone calls for collecting long-term outcome information. Twelve patients had late mortality, six in the bioprosthesis group and six in the mechanical. One patient had early perioperative mortality. The Late mortality had significant association with post-op stroke ($p < 0.001$) and post-op NYHA classes III and IV ($p = 0.002$). Post-op NYHA class was significantly associated with age ($p = 0.003$), pulmonary disease ($p = 0.017$), mitral valve type ($p = 0.011$, mechanical valves better), hypertension ($p = 0.01$), and post-op stroke ($p = 0.017$). NYHA classes were significantly better after the replacement surgeries ($p < 0.001$). Bioprosthetic valves were significantly associated with worse survival ($p = 0.03$), worse NYHA post-op ($p = 0.011$), and more re-operations ($p = 0.006$); and borderline association with late mortality. Survival was significantly better with mechanical valves ($p = 0.03$).

CONCLUSION. Mechanical mitral valve replacement in mitral stenosis patients is associated with less late mortality, better NYHA classes, less re-operation rate, and better survival as compared to bioprosthetic mitral valve replacement. Stroke occurrence is associated with late mortality and worse NYHA classes.

Sensitivity and specificity of bedside troponin I kit (qualitative) test as compared with the standardized quantitative lab test for troponin I

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BACKGROUND. Our aim was to find out the sensitivity and specificity of (qualitative) troponin I kit against the quantitative lab kit for troponin I.

MATERIAL AND METHODS. Admitted patients of ACS/NSTEMI at Karachi Institute of Heart Diseases of both gender, were administered a standardized questionnaire. Quantitative analysis of Trop I was carried out by the hospital laboratory. At the same time sample was used for qualitative analysis of troponin I by using troponin I test kit.

RESULTS. We recruited 50 patients in which 37 (74%) were male. Hypertensive 32 (64%), dyslipidemia in 13 (26%), family history in 15 (30%), DM in 16 (32%) smoking was prevalent in 11 (22%), previous MI in 10 (20%). The kit showed 97% sensitivity and 100% specificity as compared to the quantitative test with a cutoff of 0.30 ng/dL, i.e.; quantitative test showed 32 positive and 18 negative cases, whereas qualitative test shows 31 positive and 19 negative. The difference in test results was on a value of 0.40 ng/dL , as qualitative test showed it as negative result.

CONCLUSION. Study showed that qualitative kit is highly sensitive and specific at higher values of troponin I, i.e., ≥ 0.5 ng/dL. The qualitative test could be very beneficial in cost and time saving for the non-conclusive patients, like NSTEMI and ACS in emergency department and patients coming to outreach chest pain centers where laboratory services are not adequate, and whose Trop I values are not very close to the minimum cut off values.