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1. Correlation Between Serum Carboxy-Terminal Propeptide of Type I Procollagen And Fibrosis In Rheumatic Mitral Valve

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Background: Extracellular matrix remodeling associated with mitral valve fibrosis in patients with rheumatic heart valve disease (RHD) has not been extensively studied. Carboxy-terminal propeptide of type I procollagen (PICP) is a known biomarker of collagen synthesis. Rheumatic carditis, one of complications of acute rheumatic fever (ARF), will cause chronic RHD marked by fibrotic heart valves. The relationship between PICP levels and the severity of mitral valve fibrosis in RHD patients has never been investigated previously. For this reason, this study aimed to evaluate the relationship between PICP levels and the severity of mitral valve fibrosis based on histopathological examination in RHD patients.
Methods. This study is an analytical observational cross sectional study involving patients with rheumatic mitral valve disease who underwent mitral valve replacement (MVR). Serum PICP was measured before the MVR using enzyme-linked immunosorbent assay (ELISA). Histopathology assessment of fibrosis was performed on excised mitral valve leaflets and the fibrosis area was analyzed quantitatively with ImageJ software.
Results. A total of 23 patients were involved in this study. The mean serum PICP was 1,119 ± 569.6; 918 (531 – 2539) ng/ml. The mean fibrosis area was 71.5 ± 12.8; 74.9 (43.26 – 90.25)%. Spearman correlation test revealed p = 0.006 and r = 0.551.
Conclusions. PICP serum has positive correlation with degree of fibrosis in rheumatic mitral valve.

Keywords: Rheumatic mitral valve, collagen, PICP, fibrosis

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2. The Effect of Small Molecule Compound VC6TFZ on Peripheral Blood Mononuclear Cells Reprogramming

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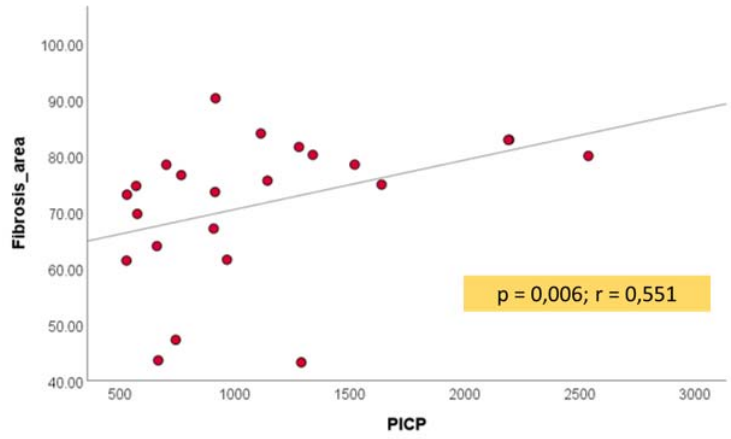
Background: Induced pluripotent stem cells (iPSCs) was generated from somatic cells through reprogramming process. Peripheral blood mononuclear cells (PBMNC) was an attractive source cells due to the ease of accessibility, need minimal invasive procedure, and can be stored frozen. Small molecule compound VC6TFZ has been successfully reprogrammed iPSCs from mouse fibroblast, but it has not been proven in human. This study performed To determine whether the small molecule compound VC6TFZ can induced pluripotency of PBMNC to generate iPSCs.
Methods: Mononuclear cells were isolated from peripheral venous blood using centrifugation gradient density method. Culture of PBMNC was carried out for 6 days in expansion medium dan 48 hours using hanging drop method. Pluripotency induction process using small molecule compound VC6TFZ was done in 14 days then the medium changed to 2i medium for 7 days. Identification of iPSCs based on colony morphology and expression of pluripotency marker OCT4 and SOX2.
Result: Colonies appear on day 9 of reprogramming process. These colonies had round, large, and cobble stone morphology like ESC. These colonies had positive expression of pluripotency markers OCT4 and SOX2. All experimental groups had significantly higher expression of OCT4 and SOX2 than control group.
Conclusion: Small molecule compound VC6TFZ could induced pluripotency of PBMNC to generate iPSCs.

Keywords: Induced pluripotent stem cells, reprogramming, peripheral blood mononuclear cells, small molecule, VC6TFZ.



Picture 1. Correlation between Serum Carboxy-Terminal Propeptide Of Type I Procollagen And Fibrosis Area in Rheumatic Mitral Valve.

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3. Effect of Platelet Rich Plasma (PRP) on Adipose derived Mesenchymal Stem Cell (AMSCs) Differentiation into Cardiomyocyte

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Background: Stem cell therapy has demonstrated beneficial effects on several cardiovascular diseases. The current challenge of therapy is inability of the heart to perform self-regeneration. Adipocyte-derived MSCs (AMSCs) is an ideal source of replacement cells because of their potential for self renewal, proliferation and differentiation. Platelet rich plasma (PRP) which contains high levels of diverse growth factors that can stimulate stem cell proliferation and differentiation in the context of cardiac tissue regeneration. This study performed To analyze the effect of PRP administration on the AMSCs differentiation into cardiomyocyte and compare to the group without PRP administration.
Methods: This study is a true experimental randomized post-test design study. AMSCs were isolated from adipose tissues and cultured until 4 passages. The samples were divided into 3 groups, i.e. negative control (α-MEM), positive control (differentiation medium), and treatment group (PRP). The assessment of GATA-4 marker expression was conducted using flowcytometry on the fifth day and cTnT was conducted using immunocytochemistry on the tenth day to determine the differentiation to cardiomyocyte. Data analysis was conducted using T-test and One-Way ANOVA on normally distributed data determined through Shapiro Wilk test.
Results: Flowcytometry on GATA-4 expression revealed significant improvement on PRP group compared to negative and positive controls (67.04 ± 4.49 vs 58.15 ± 1.23 $p < 0.05$; 67.04 ± 4.49 vs 52.96 ± 2.02 $p < 0.05$). This was supported by the results of immunocytochemistry on troponin expression which revealed significant improvement on PRP group compared to negative and positive controls (38.13 ± 5.2 vs 10.73 ± 2.39 $p < 0.05$; 38.13 ± 5.2 vs 26.00 ± 0.4 $p < 0.05$). This was concordant to the hypothesis which stated that there was an effect of PRP administration on AMSCs differentiation into cardiomyocyte.
Conclusion: PRP administration on AMSCs culture significantly improve the differentiation to cardiomyocyte measured by GATA-4 and cTnT expressions.

Keywords: Adipocyte-derived mesenchymal stem cells, platelet rich plasma, growth factor, ischemic cardiomyopathy, cardiac regeneration

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4. Major Adverse Cardiac Events of Remote Ischemic Post Conditioning on Patients with ST Segment Elevation Myocardial Infarction Who Underwent Primary Percutaneous Coronary Intervention : A Single-Center Experience

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Background: Reperfusion Injury following primary percutaneus coronary intervention (PPCI) can increase infarct size. Remote Ischemic Postconditioning (RIPostC) have a role to reduce infarct size. It can improve outcomes of this patients.
Methods: A total of 60 patients with ST-elevation myocardial infarction who underwent PPCI in RSUP dr. M. Djamil, Padang, June – October 2019, were randomized to PPCI with RIPostC protocol (n 30) versus conventional PPCI (n 30). We assessed at 6 months whether PPCI with RipostC has a beneficial effect on endpoints major adverse cardiac events (MACEs), such as re-hospital due to cardiovascular disease, re-PCI, and all-cause mortality, compared with traditional PPCI.
Result: There were no statistically significant differences for the basic characteristics and size of infarction in the two study groups. Major adverse cardiac events (MACEs) were also assessed at 6 months. At 6 months, there was no significant decrease in the incidence of all-cause mortality ($p = 0.55$), re-hospital due to cardiovascular disease ($p = 0.55$), re-PCI ($p = 1.00$). At 3-6 months, there was no significant decrease in the incidence of re-hospital due to cardiovascular disease ($p = 1.00$), re-PCI ($p = 0.31$). At 1-3 months, there was no significant decrease in the incidence of all-cause mortality ($p = 0.55$), re-PCI ($p = 0.55$). At <1 month, there was no significant decrease in the incidence of re-hospital due to cardiovascular disease ($p = 0.31$).
Conclusion: RIPostC combined with PPCI was not significant decrease in the incidence of MACE (re-hospital due to cardiovascular disease, re-PCI, and all-cause mortality) compared with traditional PPCI in patients with STEMI.

Keywords: Remote Ischemic Postconditioning, Major Adverse Cardiac Events, Primary Percutaneus Coronary Intervention, ST Segment Elevation Myocardial Infarction

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Tabel 1. Baseline clinical characteristics

Variabel	IMA – EST + IKPP		
	RIPostC (n= 30)	Tanpa RIPostC (n=30)	p-value
Umur (tahun), mean±SD	54.8 ± 8.7	54.1 ± 9	0.762b
Jenis kelamin, n			0.671c
Laki-laki	26	28	
Perempuan	4	2	
IMT (kg/m2), mean±SD	23.6 ± 2.8	24.3 ± 2.6	0.372b
Faktor risiko, n			
Hipertensi	17	10	0.119c
DM	5	6	0.739c
Merokok	23	26	0.317c
Dislipidemia	4	1	0.161c
Riwayat Keluarga	0	0	-
Menopouse	4	2	0.389c
IMA–EST, n			0.390c
Anterior	15	13	
Anterior Ekstensif	2	5	
Inferior	8	5	
Inferoposterior	5	5	
Inferior + RVI	0	2	
Waktu Iskemik (menit), mean±SD	307 ± 167	261 ± 133	0.245b
Infarct related artery, n			0.598c
LAD	17	19	
RCA	13	11	
Troponin I (ng/ml), mean±SD	8854.3±14706	5078±10823	0.262b
Terapi saat pulang, n			
Aspilet	30	30	A
Ticagrelor	29	29	1.000c
Clopidogrel	1	1	1.000c
Ramipril	19	26	0.740c
Candesartan	1	1	1.000c
Bisoprolol	20	10	0.002c*
Atorvastatin	30	30	A
Amlodipin	2	4	0.667c
Diuretik			0.399c
Furosemide	4	2	
Spironolakton	1	0	

a tidak ada nilai statistik karena nilainya konstan
b uji t-independent
c uji chi-square
*Signifikan p < 0,05

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5. Correlation between Total Ischemic Time, Serum Indexes of Collagen Type I Turnover and Left Ventricular Global Longitudinal Strain in ST-Elevation Myocardial Infarction Patients Treated with Primary Percutaneous Coronary Intervention

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Background: Left ventricular (LV) remodeling is a key prognostic factor in ST-elevation myocardial infarction (STEMI) patients. Even after successful primary percutaneous coronary intervention (PPCI), LV remodeling still occurs in 30–35 % of these patients. Adverse LV remodeling is a dynamic phenomenon involving myocardial collagen turnover and influenced by total ischemic time. Left ventricular global longitudinal strain (LV GLS) measured immediately after PPCI is an excellent predictor of adverse LV remodeling. This study aims to determine the correlation between total ischemic time, serum indexes of collagen type I turnover and LV GLS.

Methods: This study was a cross-sectional study involving STEMI patients successfully treated with PPCI. Procollagen type I carboxyterminal propeptide (PICP) was used as a marker of collagen synthesis, and carboxyterminal telopeptide of procollagen type I (ICTP) was used as a marker of collagen degradation. The ratio of PICP/ICTP was evaluated as an index of collagen type I turnover.

Results: The study included 30 patients predominantly male; with a mean age was 55.6±9.43 years old. The mean total ischemic time was 459.3±145.67 minutes. The mean PICP/ICTP ratio and LV GLS was 1.19±0.034 and -16.46±2.64%. There was a positive correlation between total ischemic time and PICP/ICTP ratio (p=0.034, r=0.388). There was a negative correlation between total ischemic time and LV GLS (p=0.003, r=-0.531). The PICP and ICTP serum were negatively correlated with LV GLS (p=0.048, r=-0.363 and p=0.003, r=-0.518) but there was no correlation between PICP/ICTP ratio and LV GLS.

Conclusion: There is biochemical evidence of the collagen turnover disruption favouring fibrosis with the increase of total ischemic time. This may suggest that fibrosis occurs in the early phase of the adverse LV remodeling process in STEMI patients successfully treated with PPCI.

Keywords. Total ischemic time, serum indexes of collagen type I turnover, global longitudinal strain.