

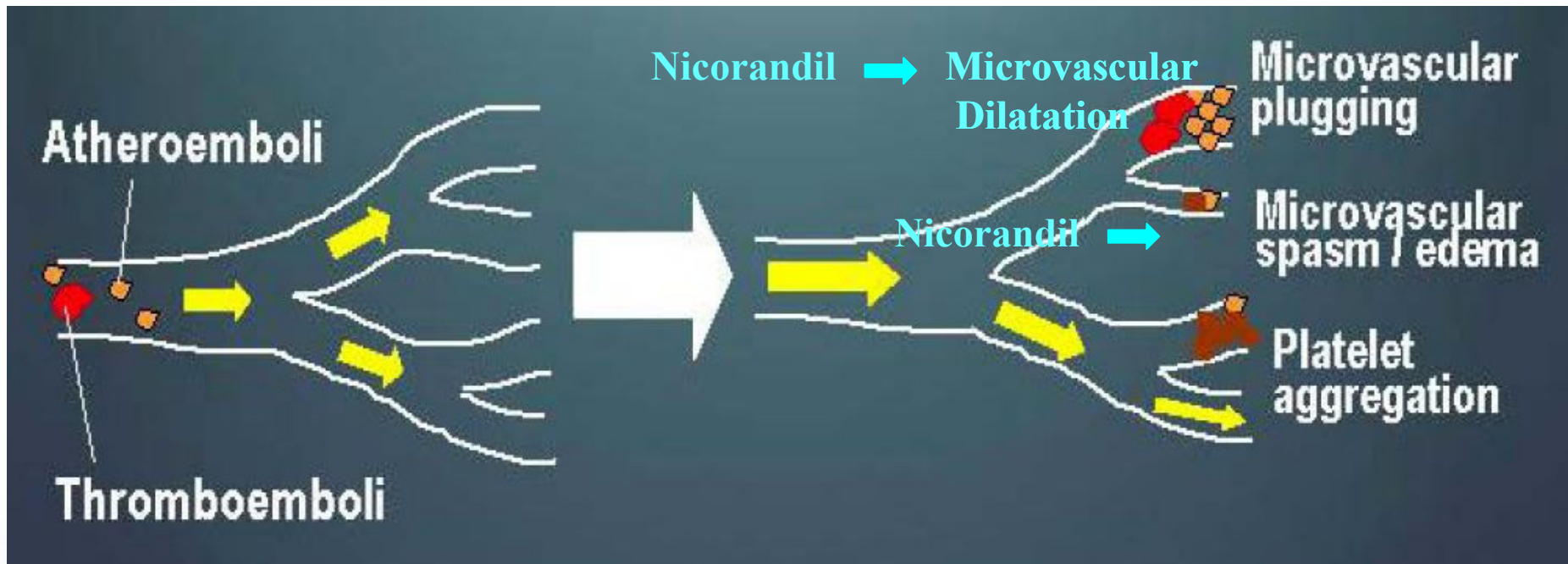


The Effect of Intra-coronary Nicorandil prior to Reperfusion in Acute ST Segment Elevation Myocardial Infarction

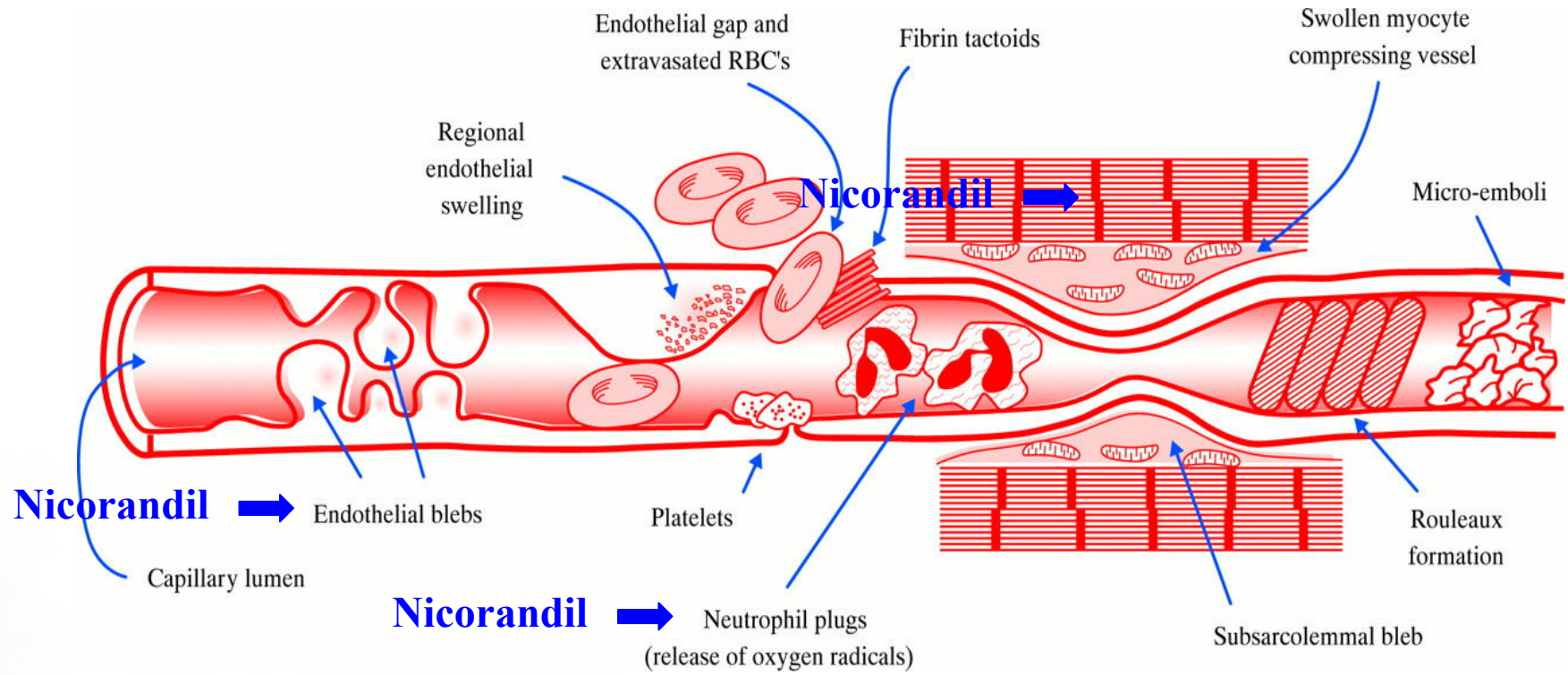
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Background



Background



Background



- Activation of adenosine triphosphate(ATP)-sensitive K⁺ channels may minimize the injury of myocardium
- Reduce inflammatory reactions by suppression of neutrophil activation and thereby reduce the resistance of the microvasculatures
- Decrease heart preload and improve myocardium microcirculation, because it dilates microvasculature (< 100μm).
- Reduce no-reflow phenomenon
- Antiarrhythmic effect

Background



- **Intravenous nicorandil** infusion with PCI has been reported to reduce reperfusion injury events and improve cardiac function in patients with an acute myocardial infarction.
- There is limited information on the use of intra-coronary nicorandil.
- A prospective randomized single center study was designed to evaluate the efficacy and safety of intra-coronary nicorandil.

Methods



- **Seventy-three patients with acute ST segment elevation myocardial infarction were randomly assigned to the nicorandil group (n=37) or a control group (n=36) all patients had a PCI.**
- **In the nicorandil group, 4 mg of intra-coronary nicorandil was infused directly into the infarct area prior to reperfusion (2 mg before ballooning, 2 mg before stenting).**

Methods



- **The composite endpoint was composed of the incidences of ventricular arrhythmia, no-reflow and slow flow.**
- **Estimated the TIMI grade, the myocardial perfusion grade after PCI and short-term clinical outcomes.**



Results

Results

Baseline Clinical Characteristics

N (73)	Nicorandil(n=37)	Control(N=36)	p Value
Age(years)	56.4± 13	60.2 ±12	0.214
Male	31(83.8%)	30(83.3%)	0.579
Hypertension	19(51.4%)	24(66.7%)	0.285
Diabetes mellitus	10(27.0%)	13(36.1%)	0.404
Smoking	32(86.5%)	25(69.3%)	0.078
Previous MI*	2(5.4%)	3(8.3%)	0.473
Previous angioplasty	1 (2.7%)	1 (2.7%)	0.337
Medication			
Aspirin	37(100%)	36(100%)	1.0
Clopidogrel	37(100%)	36(100%)	1.0
Cilostazole	7(18.9%)	9(25%)	0.11
Statin	35(94.6%)	34(94.4%)	0.35
Gp# lib/IIIa inhibitor	5(13.5%)	5(13.9%)	0.84
ACEI¶	24(67.6%)	22(61.1%)	0.76
ARB§	10(27.2%)	12(33.3%)	0.65
Hepain	37(100%)	36(100%)	1.0
Beta blocker	23(62.2%)	20(55.6%)	0.45

MI* : myocardial infarction Gp# : glypcoprotein ACEI¶ : angiotensin converting enzyme inhibitor ARB§ : angiotensin receptor blocker

Results

Angiographic characteristics

N (73)	Nicorandil(n=37)	Control(N=36)	p Value
Culprit lesion*			
LAD	20(54.1%)	20(55.6%)	0.719
LCX	2(5.4%)	8(22.2%)	
RCA	14(37.8%)	9(25.0%)	
RI	1(2.7%)	1(2.8%)	
Three vessel disease	7(18.9%)	4(11.1%)	0.351
Lesion type			
B2	16(43.2%)	12(33.3%)	0.384
C	21(56.8%)	24(66.7%)	
Thrombus score			
3	10(27.2%)	15(41.7%)	0.281
5	27(72.8%)	21(58.3%)	
Pre-TIMI grade			
0	27(72.9%)	21(58.3%)	0.188
1	0	0	0
2	8(29.6%)	9(25.0%)	0.733
3	2(5.4%)	6(16.7%)	0.124

•LAD : Left anterior descending artery LCX : left circumflex artery RCA : Right coronary artery
 RI : Ramus intermedius

Results

PCI data and Laboratory findings

N (73)	Nicorandil(n=37)	Control(N=36)	p Value
Peak CK-MB	313.5	295.3	0.538
Peak Troponin-I	110.3	83.1	0.442
Type of Stent			
Cypher	14(37.8%)	19(52.8%)	
Taxus	14(37.8%)	11(30.6%)	0.205
Endeavor	1(2.7%)	2(5.6%)	
Bare metal	3(8.5%)	0	
PTCA only	5(13.2%)	4(11.1%)	
Post-TIMI grade			
0	1(2.7%)	2(5.2%)	0.538
1	1(2.7%)	4(10.4%)	0.155
2	0	3(8.3%)	0.173
3	35(94.6%)	27(75.0%)	0.019
Myocardial blush grade			
1	0	5(13.9%)	0.019
2	11(29.7%)	10(27.8%)	0.854
3	26(70.3%)	21(58.3%)	0.287
Composite end point	2(5.4%)	8(22.2%)	0.037
No-reflow	1(2.7%)	2(5.2%)	0.538
Slow flow	1(2.7%)	4(10.4%)	0.155
Ventricular arrhythmia	0	2(5.2%)	0.146
Re-myocardial infarction	1(2.7%)	0	0.321

Results

Clinical Outcomes



N (73)	Nicorandil(n=37)	Control(N=36)	p Value
In-hospital outcomes			
Death	0	0	0
TLR*	1(2.7%)	0	1.0
non Q wave MI #	1(2.7%)	0	1.0
VT ¶ or VF § in hospital	0	0	0
30 days follow-up outcomes			
Death	0	0	0
TLR	1(2.7%)	2(5.2%)	0.615
non Q wave MI	1(2.7%)	1(2.6%)	1.0
Q wave MI	0	1(2.6%)	0.493

TLR * : target lesion revascularization MI# : myocardial infarction
VT¶ : ventricular tachycardia VF§ : ventricular fibrillation

Results



- Significant difference in the **composite endpoint (No-reflow, slow flow, ventricular arrhythmia)** in the nicorandil group
- **The post TIMI grade 3** was higher in the nicorandil group
- **The myocardial perfusion grade 1** was not observed in the nicorandil group
- Major adverse cardiac events in hospital and in 30 days were similar between two groups

Conclusion



- **Intra-coronary nicorandil infusion reduced the occurrence of no-reflow, slow reflow, reperfusion arrhythmia and improved the myocardial perfusion grade and TIMI flow during PCI.**
- **Intra-coronary nicorandil may improve left ventricular function and clinical outcomes in patients with an acute myocardial infarction**
- **Need multicenter trial**



Thank you for your attention