

EFFICACY OF INTRACORONARY EPINEPHRINE IN STEMI PATIENTS WITH REFRACTORY CORONARY NO REFLOW DURING PERCUTANEOUS CORONARY INTERVENTION

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Introduction

The no-reflow phenomenon is a common complication during primary percutaneous coronary intervention. The frequency of no reflow may be encountered in up to 50% of primary percutaneous coronary intervention cases but in elective PCI cases, it is around 0.6–5%. Because of high resistance secondary to microvascular obstruction (MVO), no-reflow results in impaired myocardial perfusion that is associated with severe chest pain, cardiogenic shock with hypotension, life threatening arrhythmias either bradyarrhythmia or tachyarrhythmia, hemodynamic collapse, MI, congestive heart failure leading to pulmonary edema , and death.

Aim of the work

The aim of the study was to assess efficacy and safety of intracoronary epinephrine in STEMI patients with refractory coronary no-reflow during primary PCI. The efficacy was determined by improvement of TIMI flow and myocardial blush grade.

Subjects and methods

The study was a single – centered ,prospective and observational study .It included one hundred patients with no reflow during PPCI in Alexandria main university hospital. All of the patients received intracoronary verapamil (dose: 100–500 µg bolus (max 1 mg)). If no reflow persists, adrenaline were given IC (dose: 80–100 µg bolus). Adrenalin was repeated if no reflow persists up to 3 boluses. Inclusion criteria: STEMI at presentation. Admitted for PPCI with refractory no reflow in the culprit vessel. Exclusion criteria:Coronary spasm and dissection. Closed angle glaucoma. Known history of drug hypersensitivity. Valvular heart disease. Congenital heart disease. Contraindications to use aspirin or clopedogril. Cardiomyopathy. Pericarditis or myocarditis.

Results

We found that fifty one patients with no reflow received intracoronary verapamil with improvement in TIMI flow (TIMI 3 in 76.5 % , TIMI 2 in 21.5 % , TIMI I 2 % and TIMI 0 in 0 %) and MBG (MBG 3 in 66.7 % , MBG 2 in 25.5 % , MBG 1 in 3.9 % , MBG 0 in 3.9 %).

Forty nine patients were refractory to verapamil and given intracoronary epinephrine to resolve no reflow with improvement in TIMI flow (TIMI 3 in 65.3 % , TIMI 2 in 28.6 % , TIMI I in 2% , TIMI 0 in 4.1 %). As regards ejection fraction, it was statistically higher among patients received adrenalin (43.19±8.39) than among those who did not receive adrenalin (39.73 ± 5.62), (p=0.017). Regarding safety of epinephrine, ventricular tachycardia occurred in 2 patients received epinephrine and resolved by cardioversion. Regarding MACE (major adverse cardiac events) during hospitalization which including heart failure , cardiogenic shock, there were no significant difference between patient received epinephrine and not received it (12% with epinephrine and 13% with no epinephrine).

Table: Comparison of TIMI flow , MBG and EF between groups of patients who received epinephrine with verapamil and verapamil without epinephrine

		Overall (n=100)		No Adrenalin (n=51)		With Adrenalin (n=49)		Test of significance
		N	%	N	%	N	%	
TIMI (Before)	0	40	40	15	29.4	25	51	$\chi^2 = 4.862$ p = 0.027*
	1	60	60	36	70.6	24	49	
TIMI (After)	0	2	2	0	0.0	2	4.1	Fisher exact = 2.881 p = 0.448
	1	2	2	1	2	1	2	
	2	25	25	11	21.6	14	28.6	
	3	71	71	39	76.5	32	65.3	
Test of significance		$\chi^2 = 184.639$ p <0.001**		$\chi^2 = 98.108$ p <0.001**		$\chi^2 = 86.753$ p <0.001**		
MBG (Before)	0	74	74	34	66.7	40	81.6	$\chi^2 = 2.909$ p = 0.088
	1	26	26	17	33.3	9	18.4	
MBG (After)	0	5	5	2	3.9	3	6.1	Fisher exact = 2.697 p = 0.444
	1	8	8	2	3.9	6	12.2	
	2	24	24	13	25.5	11	22.4	
	3	63	63	34	66.7	29	59.2	
Test of significance		$\chi^2 = 156.795$ p <0.001**		$\chi^2 = 87.287$ p <0.001**		$\chi^2 = 72.437$ p <0.001**		
Ejection fraction	min-max	20-60		27.5-53		20-60		t = -2.437
	mean ± SD	41.43 ± 7.29		39.73 ± 5.62		43.19 ± 8.39		p = 0.017*

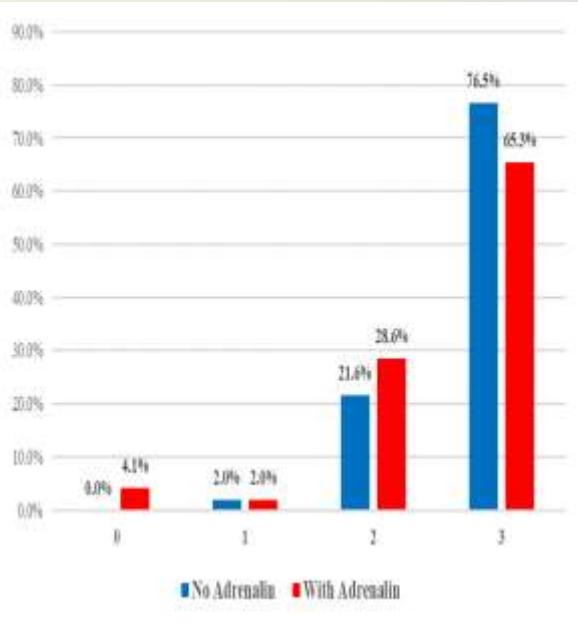


Figure 1: TIMI final flow in the groups treated with IC epinephrine and no-epinephrine

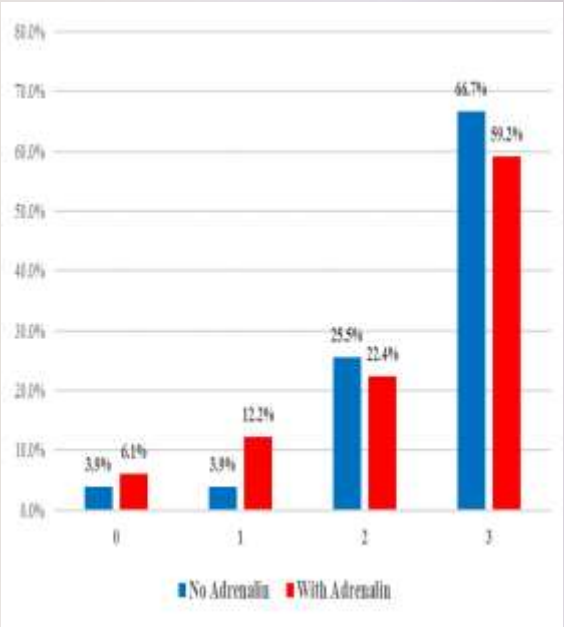


Figure 2: MBG in the groups treated with IC epinephrine and no-epinephrine

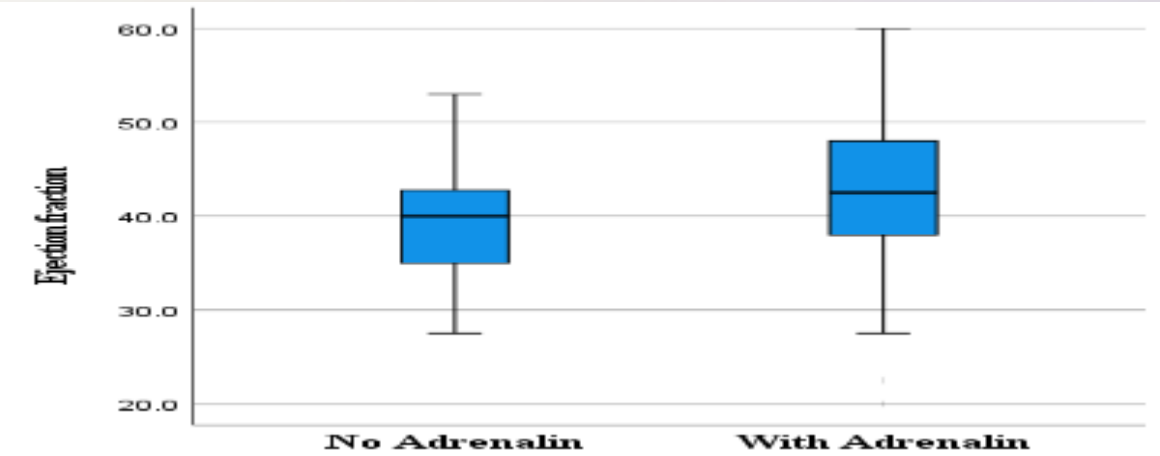


Figure 3: Ejection fraction in groups of patients received IC epinephrine or not

Conclusion

Intracoronary adrenaline provided improvement in coronary blood flow and left ventricular ejection fraction in STEMI patients with refractory no reflow which failed to intracoronary verapamil .