# INTRAVENOUS NICORANDIL VERSUS ADENOSINE FOR FRACTIONAL FLOW RESERVE MEASUREMENT TO ASSESS

CORONARY ARTERY STENOSIS- A META-ANALYSIS

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## Introduction

- Fractional flow reserve (FFR) is the gold investigation used to assess coronary artery stenosis.
- Several clinical trials have been conducted using different drugs to achieve the maximum possible coronary hyperemia.
- Nicorandil and Adenosine are on the top of the list with many trials comparing their efficacy.
- Superior clinical outcomes have been achieved with FFR-guided percutaneous coronary intervention (PCI) as compared to angiography-guided PCI.
- However, despite increasing evidence of cost-effectiveness strong recommendations in current practice guidelines, FFR is still seldom used in the clinical setting

#### Method

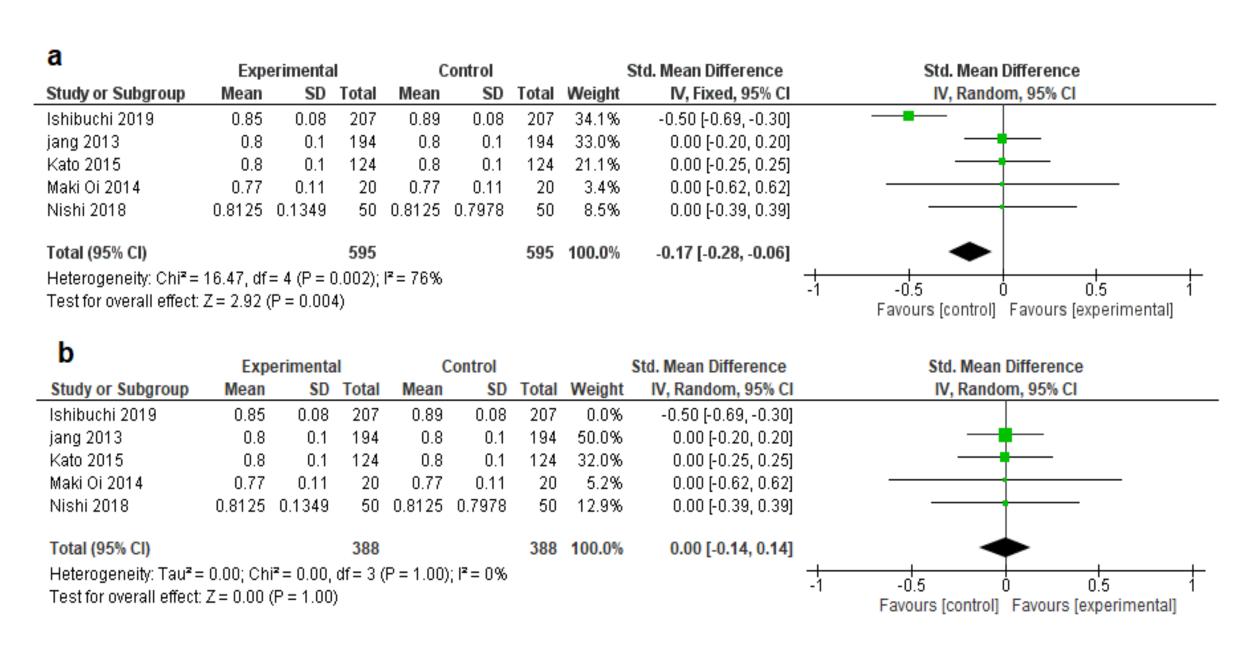
- We searched in PubMed, Cochrane Library, Scopus, and Web of Science for available studies from their inception through March 2020.
- We different studies randomized studies or observational studies that compared nicorandil versus adenosine for Fractional flow reserve (FFR) measurement.
- Data were extracted from the eligible studies and pooled in a meta-analysis model by means of Revman software.
- Dichotomous data were pooled as risk ratio (RR) and continuous data were pooled as standardized mean difference (SMD) with the corresponding 95% confidence intervals (CI).
- We intended to evaluate the average FFR, hyperemia, duration of hyperemia, decrease in systolic blood pressure, and pain scores assessed by visual analog scale (VAS).

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**Fig1:** shows a forest plot for analysis of FFR outcome, a) heterogeneous results, and b) homogeneous results after the leaveone-out



shows a forest plot for analysis of decrease in SBP outcome.

	Experimental			Control			9	Std. Mean Difference	Std. Mean Difference	
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% Cl	
Ishibuchi 2019	9.5	9	207	10.5	22	207	27.3%	-0.06 [-0.25, 0.13]	-	
Kato 2015	5.5	5.8	124	9.6	9.6	124	26.8%	-0.52 [-0.77, -0.26]		
Maki Oi 2014	9	5.7	20	15.9	8.4	20	21.1%	-0.94 [-1.60, -0.29]	<del></del>	
Nishi 2018	24	10	50	12	14	50	24.8%	0.98 [0.56, 1.39]	-	
Total (95% CI)			401			401	100.0%	-0.11 [-0.71, 0.49]		
Heterogeneity: Tau² : Test for overall effect	·-		-	-2 -1 0 1 2 Favours [experimental] Favours [control]						

 $\mathbf{Fig}$  2: shows forest plot for analysis of hyperemia outcome.

Kato 2015 21.8 5.5 124 105.9 33.5 124 50.2% -3.49 [-3.89, -3.10]   Nishi 2018 34 13 50 58 15 50 49.8% -1.70 [-2.16, -1.24]		Expe	C	Control			Std. Mean Difference	Std. Mean Difference		
Nishi 2018 34 13 50 58 15 50 49.8% -1.70 [-2.16, -1.24]	Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% Cl
	Kato 2015	21.8	5.5	124	105.9	33.5	124	50.2%	-3.49 [-3.89, -3.10]	•
Total (95% CI) 174 174 100.0% -2.60 [-4.36, -0.84]	Nishi 2018	34	13	50	58	15	50	49.8%	-1.70 [-2.16, -1.24]	•
1 1 T	Total (95% CI)			174			174	-2.60 [-4.36, -0.84]	•	

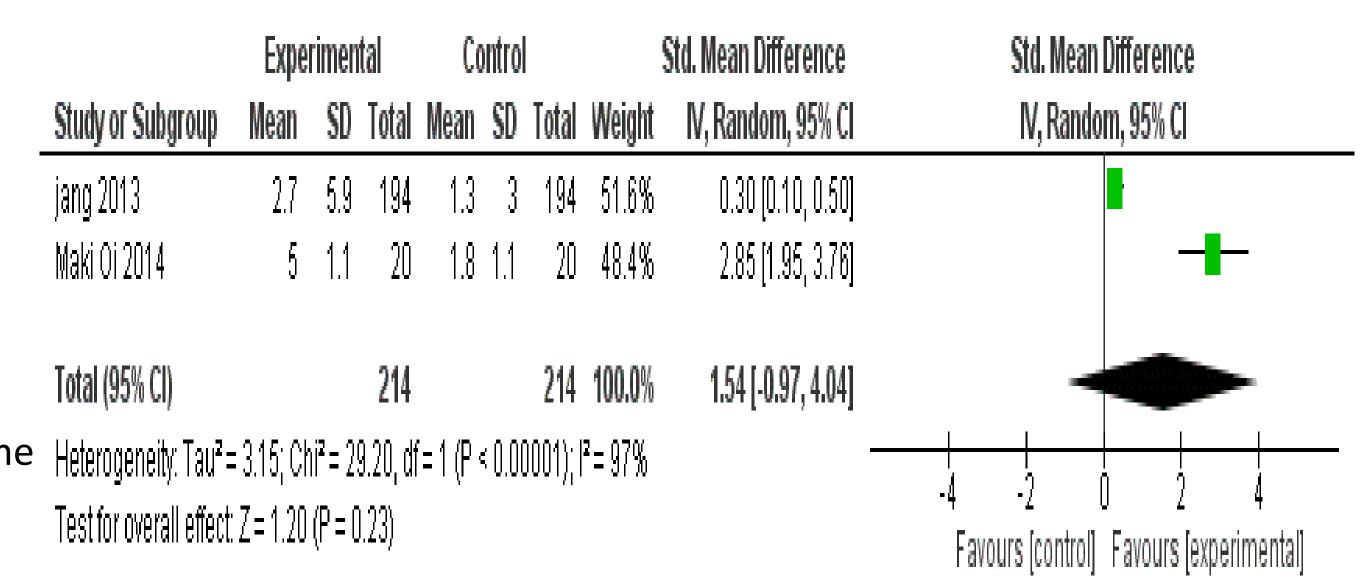
Heterogeneity:  $Tau^2 = 6.70$ ;  $Chi^2 = 45.62$ , df = 1 (P < 0.00001);  $I^2 = 98\%$ 

Test for overall effect: Z = 0.98 (P = 0.33)

<b>Fig 3:</b> s	how	'S a	a fo	rest	plo	ot fo	or an	alysis of dura	ation of hyperemia outcom	E	
	Control			Experimental			ļ	Std. Mean Difference	Std. Mean Difference		
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI		
jang 2013	17	25	194	17	3.3	194	51.0%	0.00 [-0.20, 0.20]			
Maki Oi 2014	22.7	5,9	20	95.7	26.7	20	49.0%	-3.70 [-4.76, -2.65]	<b>—</b>		
Total (95% CI)			214			214	100.0%	-1.81 [-5.44, 1.81]			

Favours (control) Favours (experimental)

Fig 5: shows a forest plot for analysis of VAS score for pain outcome.



#### Results

- Five studies met our inclusion criteria with 595 included patients.
- The combined effect estimate favored the nicorandil group over adenosine groups in terms of mean FFR (SMD=-0.17, 95% CI [-0.28, -0.06], P=0.004). (Fig. 1)
- Nicorandil was more effective in achieving hyperemia compared to adequate adenosine (SMD=-2.06, 95% CI [-4.36, -0.84], P=0.004). (Fig. 2)
- However, no significant differences were between nicorandil reported adenosine in the duration of hyperemia, the decrease in systolic blood pressure, and VAS pain scores. (Fig. 3,4,5)
- Study characteristics were summarized in included: Tables and types interventions, Dose, factors, Minimum Reference diameter, mm, luminal diameter (mm), Diameter stenosis (%), and Lesion length (mm).

### Conclusion

- Nicorandil is associated with better clinical and safety outcomes compared with adenosine.
- therefore recommended alternative hyperemic agent.