

Intracoronary adenosine for bolus thermodilution



Madrid Microcirculation
Meeting - 4th Edition -



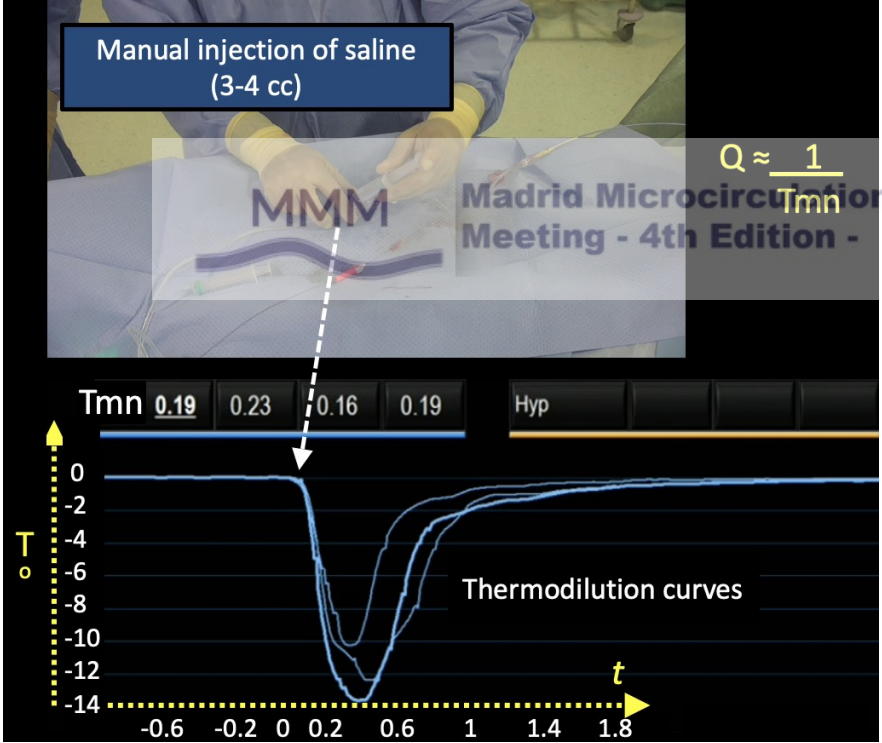
Hospital Universitario
de La Princesa

Hernán Mejía-Rentería, MD, PhD, FESC

Hospital Clínico San Carlos, Madrid, Spain

Common methods for microcirculation assessment

Bolus thermodilution



Intravenous adenosine



Limitations for adoption of bolus thermodilution and IV adenosine



Procedure time



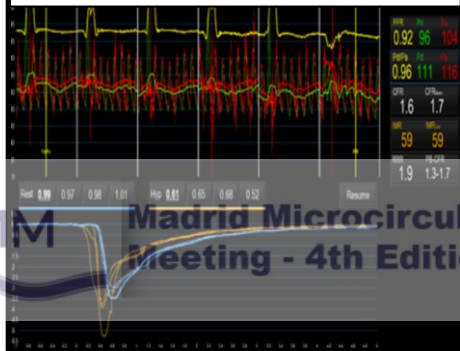
Patient discomfort

Conventional

Alternatives

Techniques

Bolus
thermodilution



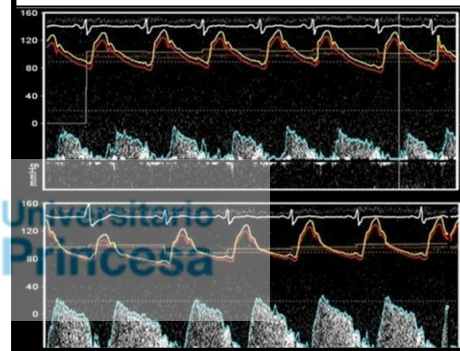
IV Adenosine

Hyperemic
drugs

~~Continuous
thermodilution~~



~~Doppler~~



IV Regadenoson

IC Nicorandil

IC papaverine

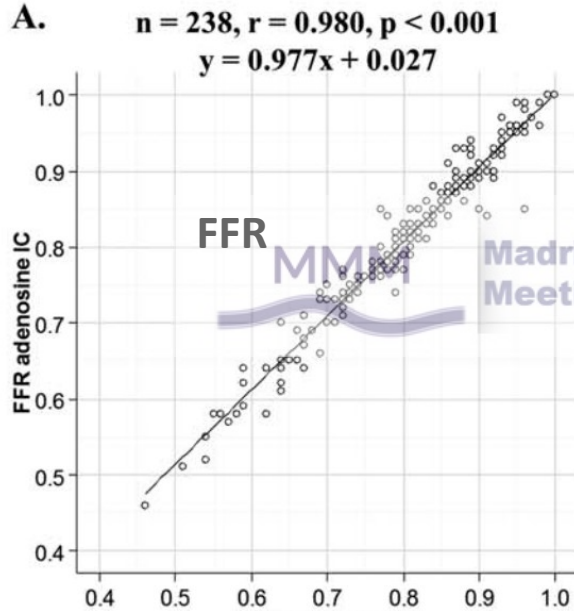
IC Adenosine

MMM Madrid Microcirculation Meeting - 4th Edition -

Hospital Universitario de La Princesa

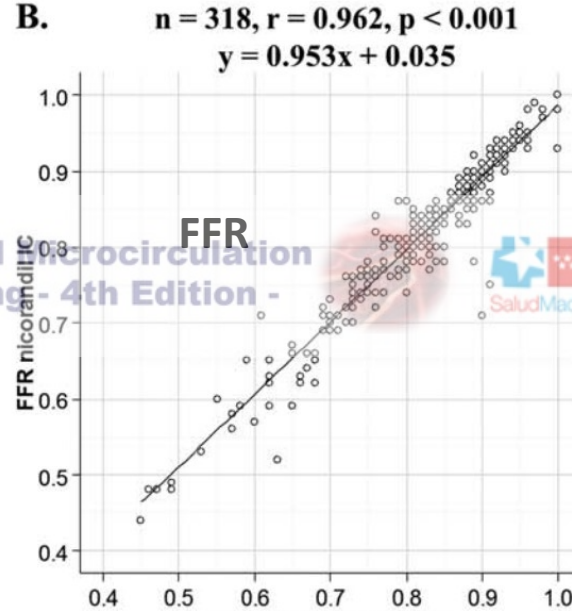
IC adenosine is a valid alternative for FFR assessment

IC adenosine



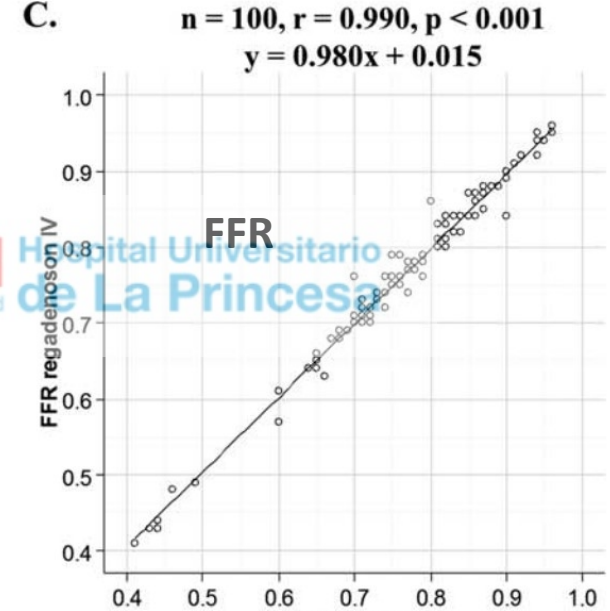
IV adenosine

IC Nicorandil

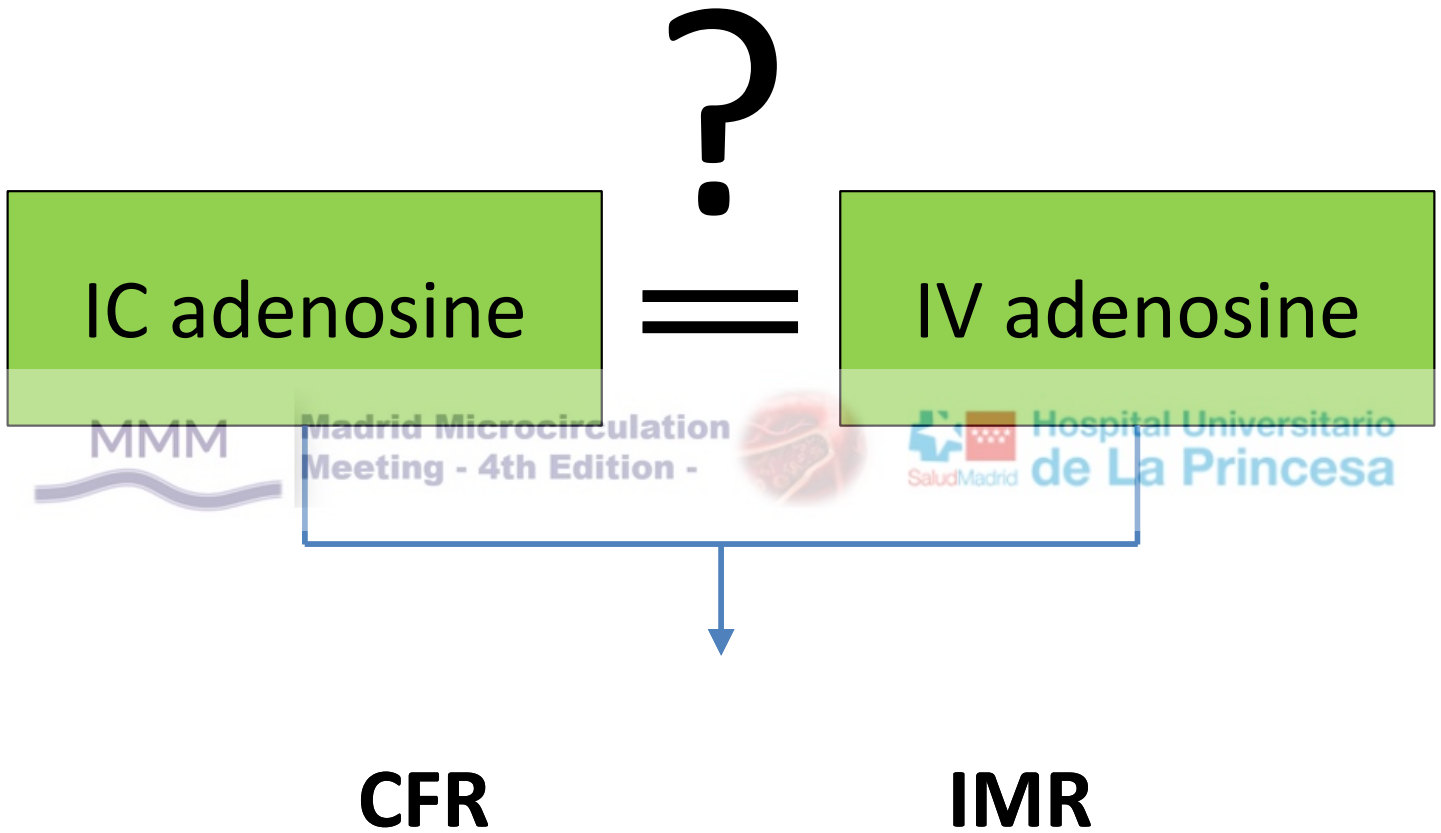


IV adenosine

IV Regadenoson



IV adenosine



IC adenosine

=

IV adenosine

?

MMM

Madrid Microcirculation Meeting - 4th Edition -

SaludMadrid

Hospital Universitario de La Princesa

CFR

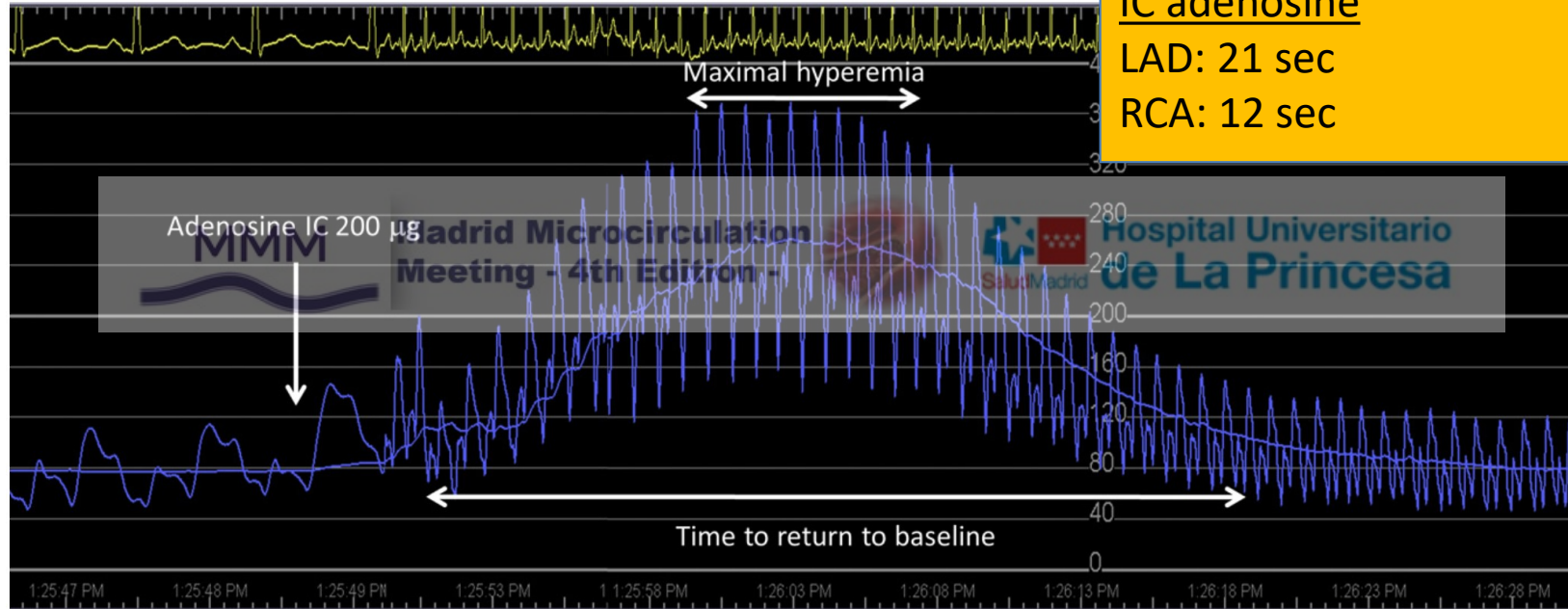
IMR

Time of maximal hyperemia with IC adenosine

Hyperemia Plateau with
IC adenosine

LAD: 21 sec

RCA: 12 sec



Questions

- Is IC adenosine feasible to assess the microcirculation using bolus thermodilution?
- Is IC adenosine better tolerated than IV adenosine when assessing the coronary microcirculation?
- Are CFR and IMR values obtained with IC adenosine comparable to those values obtained with IV adenosine?
- Can IC adenosine shorten procedure time compared to IV adenosine?

Objectives

- We investigated whether the assessment of the microcirculation with IC adenosine using bolus thermodilution is feasible, and whether IC adenosine compared to IV adenosine facilitates the assessment of this condition in terms of procedural time and patient discomfort in patients with INOCA

IC adenosine administration



Madrid Microcirculation Meeting 4th Edition vs.

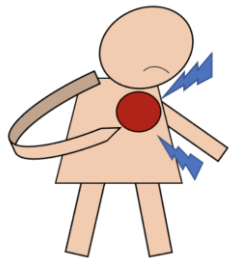


IV adenosine administration



Methodology

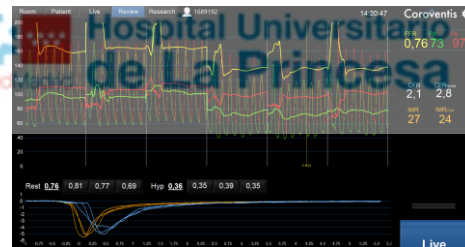
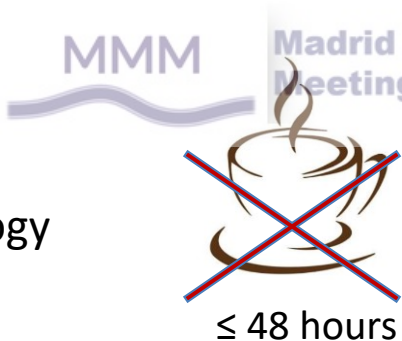
Study population



INOCA

$\%DS < 50\%$ / $FFR > 0.80$

Methodology



1. Low-Dose IC Adenosine at 150mcg for LCA or 60mcg for RCA

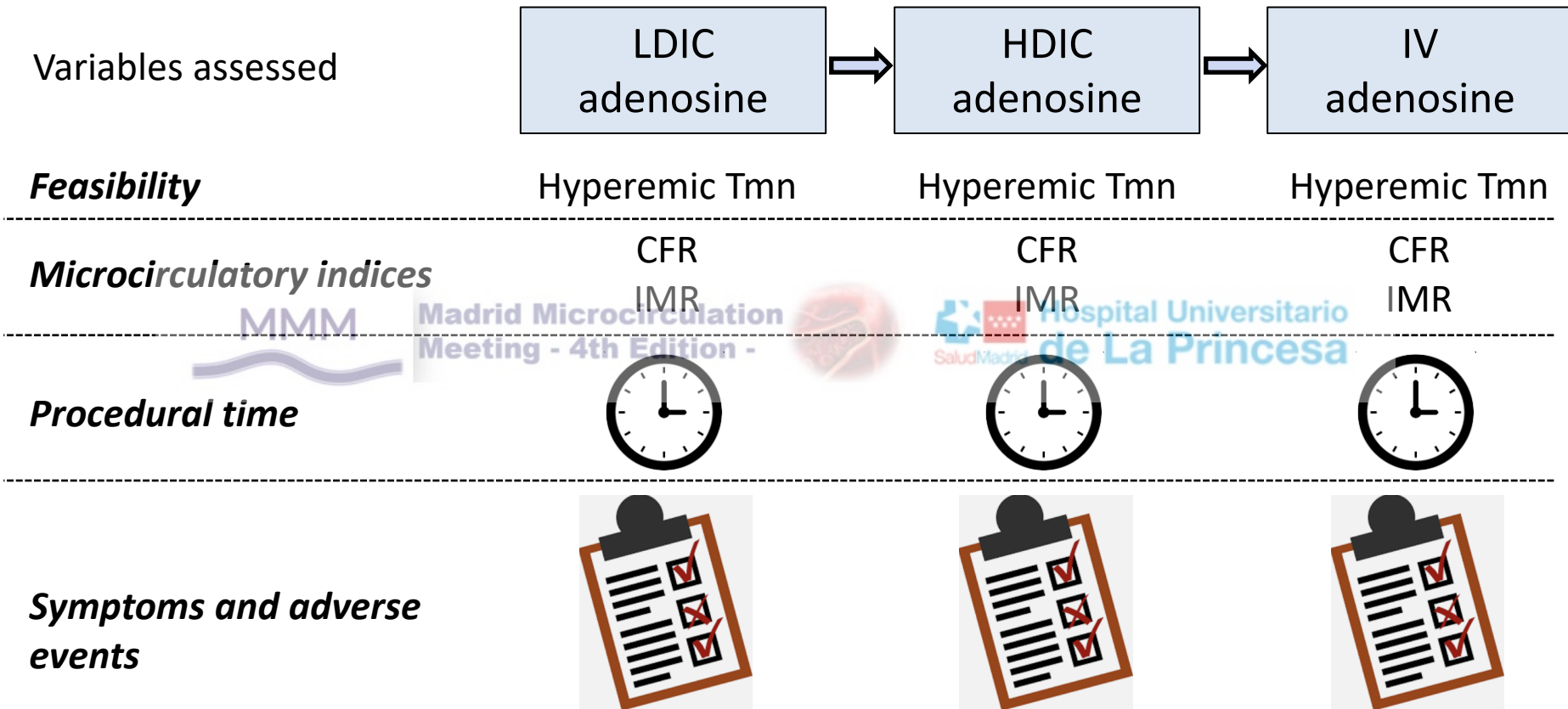


2. High-Dose IC Adenosine at 200mcg for LCA or 100mcg for RCA



3. IV Adenosine 140/mcg/Kg/min by peripheral vein

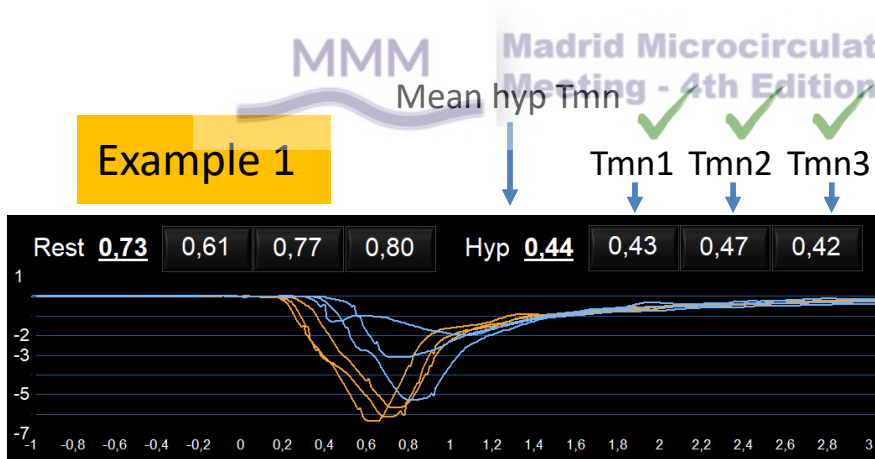
End-points



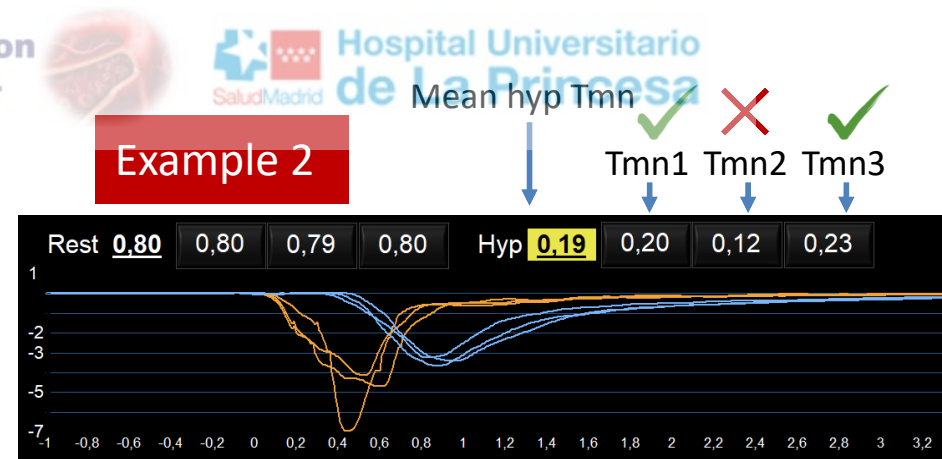
Assessment of IC adenosine feasibility with bolus thermodilution

hyp Tmn values deviated $\leq 30\%$ from the average: ✓

hyp Tmn values deviated $> 30\%$ from the average: ✗



No. of hyp Tmn valid: 3



No. of hyp Tmn valid: 2

Results

Baseline characteristics

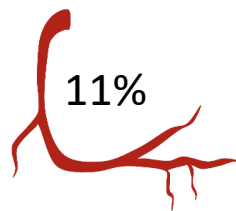
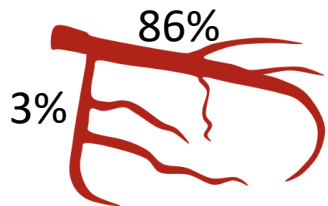
N = 102 patients

Mean age 62.6 ± 11.4 yrs



MMM

Madrid Microcirculation Meeting - 4th Edition -



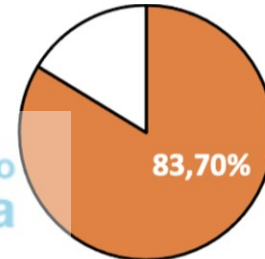
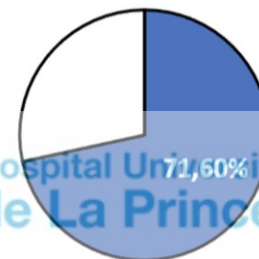
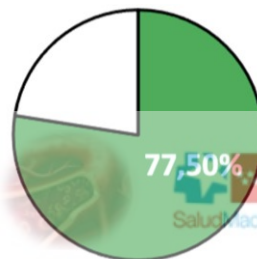
Feasibility of IC adenosine

LDIC

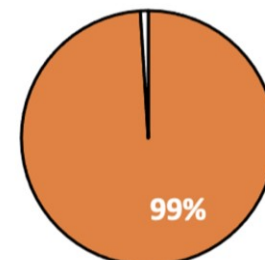
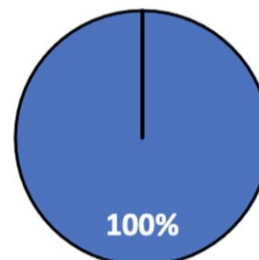
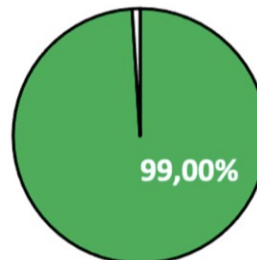
HDIC

IV

No. of Tmn_h valid = 3



No. of Tmn_h valid = 2

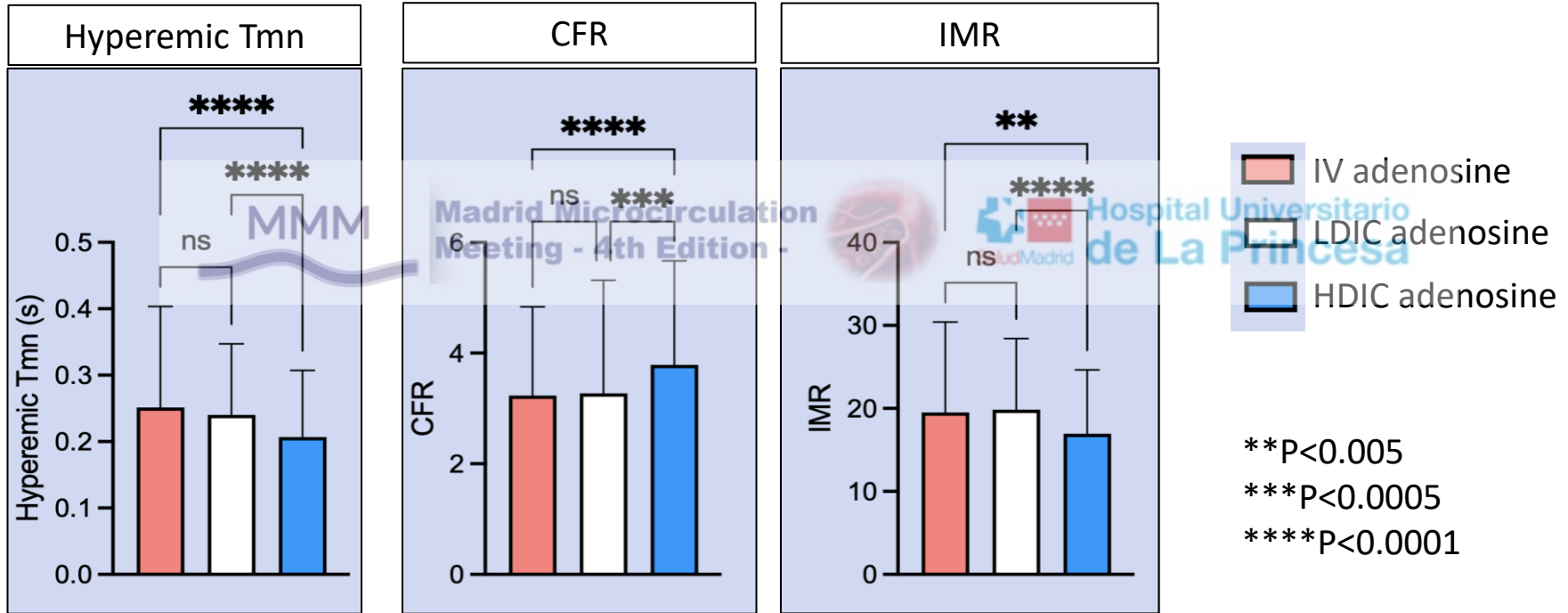


Hospital Universitario de La Princesa

SaludMadrid

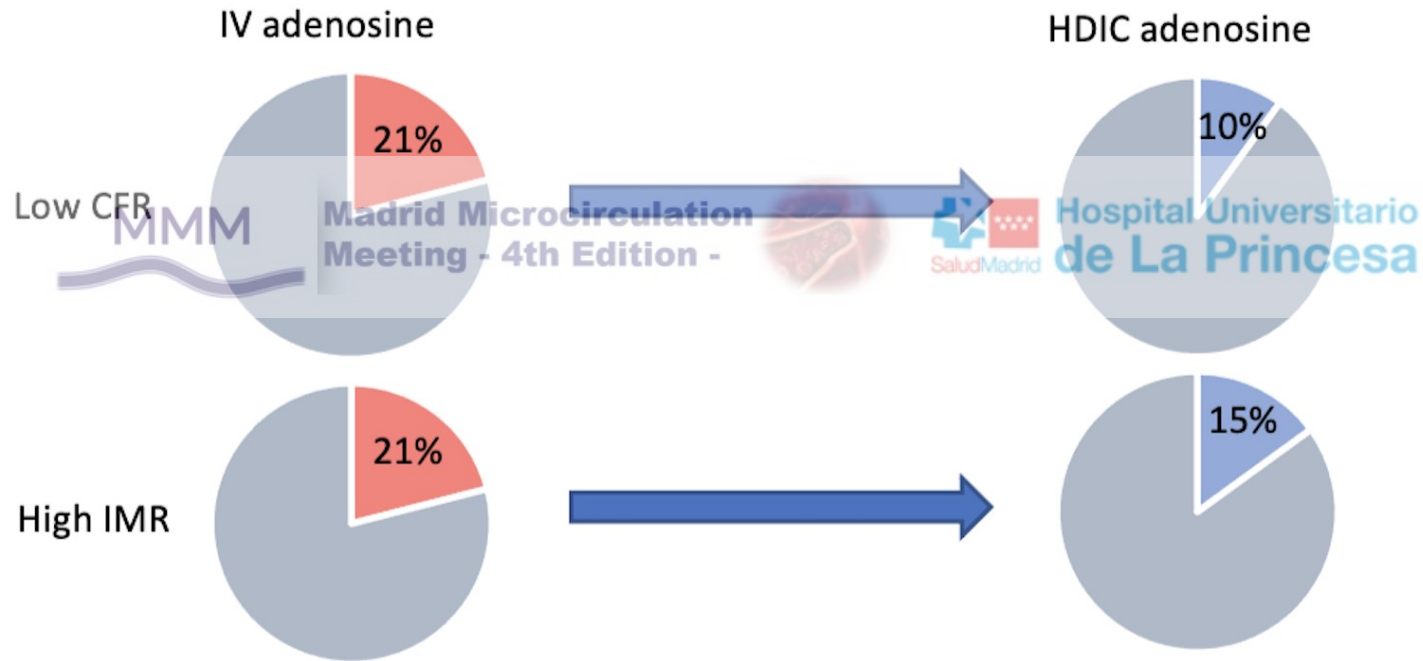
Results

Greater hyperemia achieved with high dose of IC adenosine



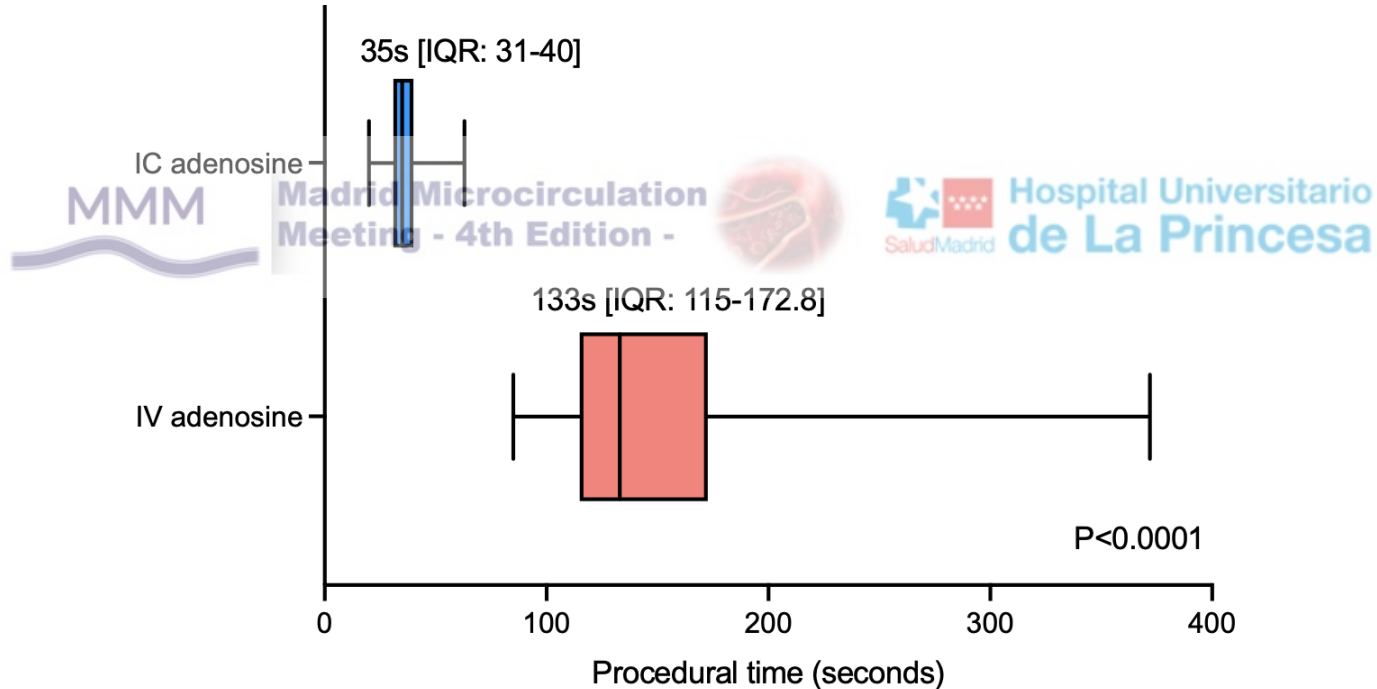
Results

Reclassification of CMD with IC adenosine



Results

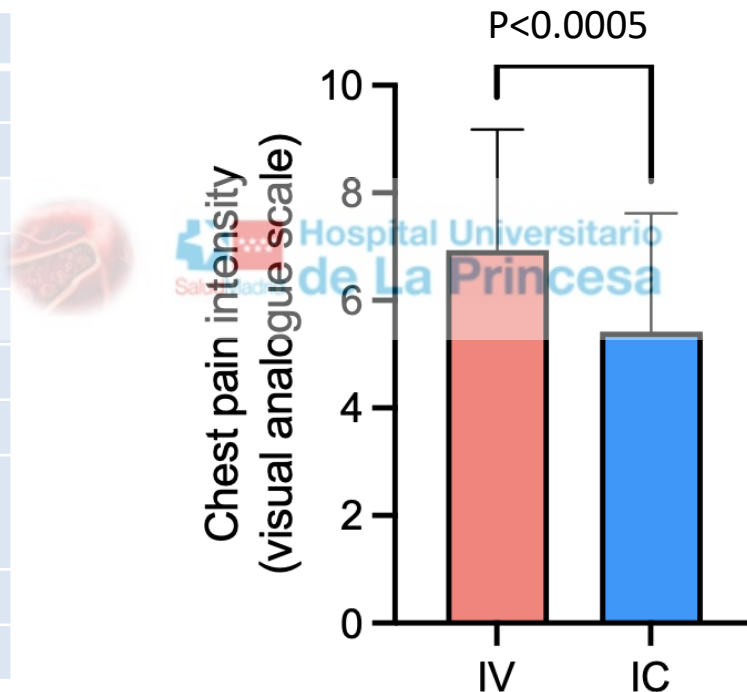
Comparison of procedural time between IC and IV adenosine



Results

Symptoms and adverse events associated to IC and IV adenosine

	IV adenosine	IC adenosine
Chest pain	75 (72)	55 (53)
Breathlessness	56 (54)	9 (9)
Headache	25 (24)	10 (10)
Dizziness	11 (11)	2 (2)
Nausea	14 (14)	2 (2)
Vomiting	1 (1)	0
AV block	1 (1)	8 (8)
Ventricular arrhythmias	0	0
Atrial fibrillation	0	0
Bronchospasm	0	0



Conclusions

- In INOCA patients, coronary microcirculatory assessment with IC adenosine using bolus thermodilution is feasible and safe.
- The magnitude of hyperemia achieved with IC adenosine (200 mcg for the LCA or 100 mcg for the RCA) is significantly greater than IV adenosine, as demonstrated by a shorter hyperemic Tmn, higher CFR and lower IMR.
- In consequence, a significant proportion of cases classified as CMD with IV adenosine was downgraded with IC adenosine.
- Procedural time was significantly shorter and patient tolerability was better with IC adenosine compared to IV adenosine.