

# LA PRESENZA INSUFFICIENZA MITRALICA PUÒ MODIFICARE IL RISCHIO TROMBOEMBOLICO NEI PAZIENTI CON FIBRILLAZIONE ATRIALE NON VALVOLARE?

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Risultati di uno studio osservazionale retrospettivo

# BACKGROUND

- ❖ Atrial fibrillation (AF) significantly increases the risk of ischemic stroke.
- ❖ Many scores, such as the CHA2DS2-VASc score, have been developed to guide physicians in their decision to start anticoagulation. However, the risk prediction with these models is modest at best (C-statistic = 0.6).
- ❖ Severe mitral regurgitation (MR) has been shown to decrease left atrial thrombus formation and systemic thromboembolic events in AF patients with rheumatic valve disease with an observed risk reduction of more than 50%.
- ❖ In nonrheumatic AF, however, direct evidence of a lower incidence of thrombus or left atrial spontaneous echo contrast in patients with MR is still controversial.

# **Effect of Mitral Regurgitation on Thrombotic Risk in Patients With Nonrheumatic Atrial Fibrillation: A New CHA<sub>2</sub>DS<sub>2</sub>-VASc Score Risk Modifier?**

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# METHODS

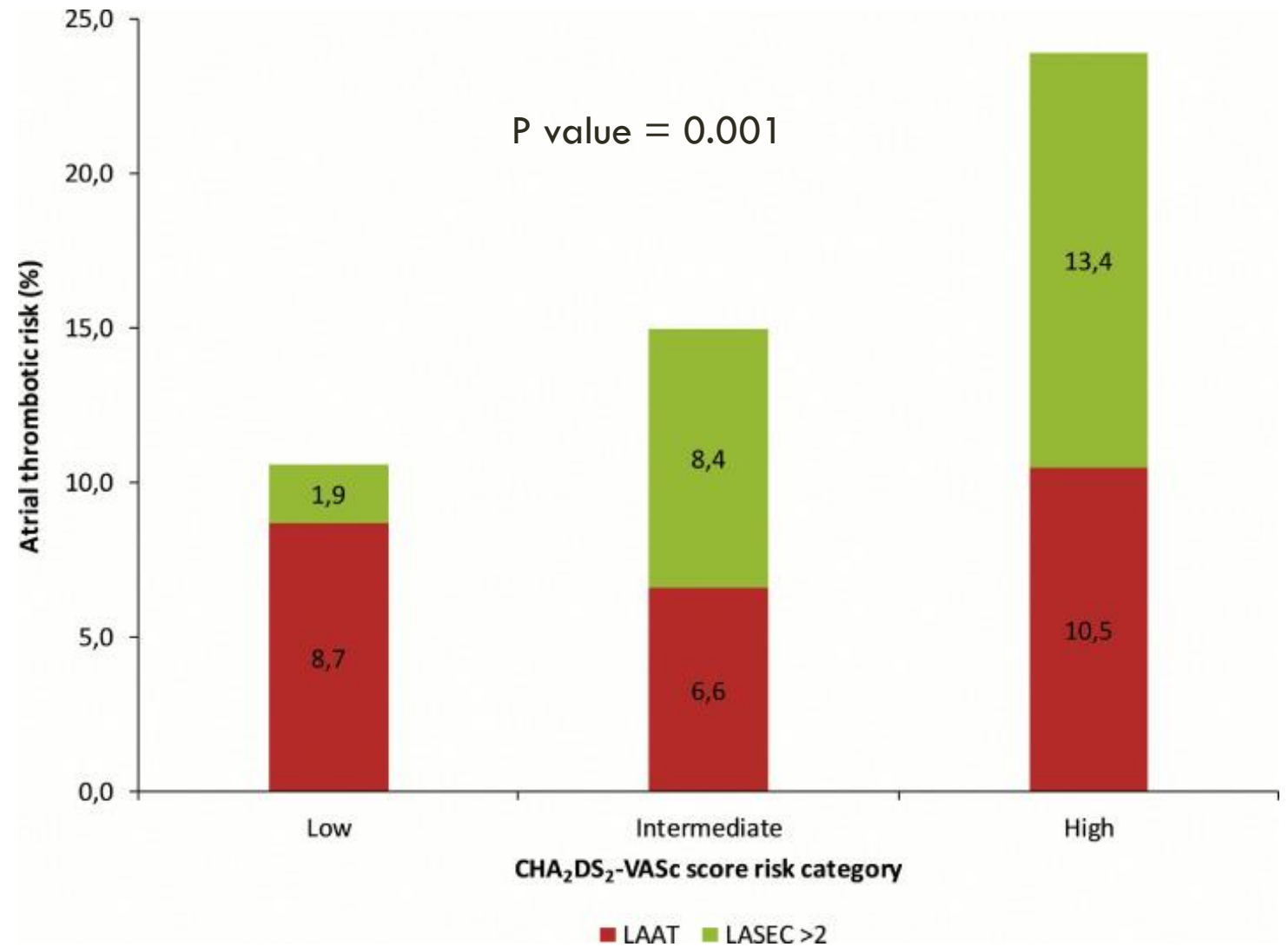
- ❖ Target study population: 795 consecutive patients referred for electrical cardioversion for AF from January 2013 until December 2018 who underwent a TEE before cardioversion
- ❖ All patients without evidence of adequate anticoagulation during at least 3 weeks
- ❖ 109 patients were excluded because of associated mitral valve stenosis (n=10), postmitral valve surgery (n=11), post left atrial appendage (LAA) ligation/LAA closure device (n=31), active oncological disease (n=49), or missing data/poor echo visualization (n=8).
- ❖ The final study population consisted of 686 AF patients
- ❖ The prevalence of atrial thrombosis, defined as the presence of left atrial appendage thrombus (LAAT) and/or left atrial spontaneous echo contrast (LASEC) grade >2, was determined

# CLINICAL CHARACTERISTICS OF PATIENTS

Characteristics	Mitral regurgitation			p value
	No-mild (n = 373)	Moderate (n = 210)	Severe (n = 103)	
Age (years)	65.1 ± 11.1	69.7 ± 10.6	70.0 ± 11.2	<0.001
Female	76 (20.4%)	73 (34.8%)	41 (39.8%)	<0.0001
BMI (kg/m <sup>2</sup> )	28.2 ± 4.9	27.9 ± 5.5	27.4 ± 4.9	0.346
Systolic blood pressure (mm Hg)	133.3 ± 23.3	133.9 ± 22.1	131.6 ± 22.4	0.704
Diastolic blood pressure (mm Hg)	83.3 ± 15.7	82.4 ± 15.5	83.3 ± 14.9	0.777
Paroxysmal/persistent AF	160/142 (53.0%/47.0%)	103/63 (62.0%/38.0%)	43/33 (56.6%/43.4%)	0.17
Chronic kidney disease	56 (15.0%)	59 (28.1%)	30 (29.1%)	0.0001
eGFR (ml/min/1.73 m <sup>2</sup> )	73.9 ± 20.1	68.1 ± 21.4	63.8 ± 22.1	<0.001
Congestive heart failure	72 (19.3%)	64 (30.5%)	45 (43.7%)	<0.0001
Hypertension	226 (60.6%)	138 (65.7%)	59 (57.3%)	0.29
Diabetes mellitus	74 (19.8%)	49 (23.3%)	22 (21.4%)	0.61
History of stroke, TIA or TE	57 (15.3%)	26 (12.4%)	12 (11.7%)	0.49
Vascular disease	147 (39.4%)	85 (40.5%)	51 (49.5%)	0.17
Hypercholesterolemia	224 (60.1%)	121 (57.6%)	52 (50.5%)	0.22
Medication				
Antiplatelet agent	134 (35.9%)	79 (37.6%)	40 (38.8%)	0.83
Antiarrhythmics	96 (25.7%)	60 (28.6%)	27 (26.2%)	0.75
No anticoagulation	174 (46.6%)	88 (41.9%)	53 (51.5%)	0.26
Echocardiographic findings				
LVEF (%)	53.4 ± 14.1	50.7 ± 15.5	44.9 ± 15.1	<0.001
LAVI (ml/m <sup>2</sup> )	36.6 ± 11.3	41.0 ± 13.2	49.3 ± 16.5	<0.001
CHA <sub>2</sub> DS <sub>2</sub> -VASc score				
Total CHA <sub>2</sub> DS <sub>2</sub> -VASc score	3.0 (1.0-4.0)	3.0 (2.0-5.0)	3.0 (2.0-5.0)	<0.001

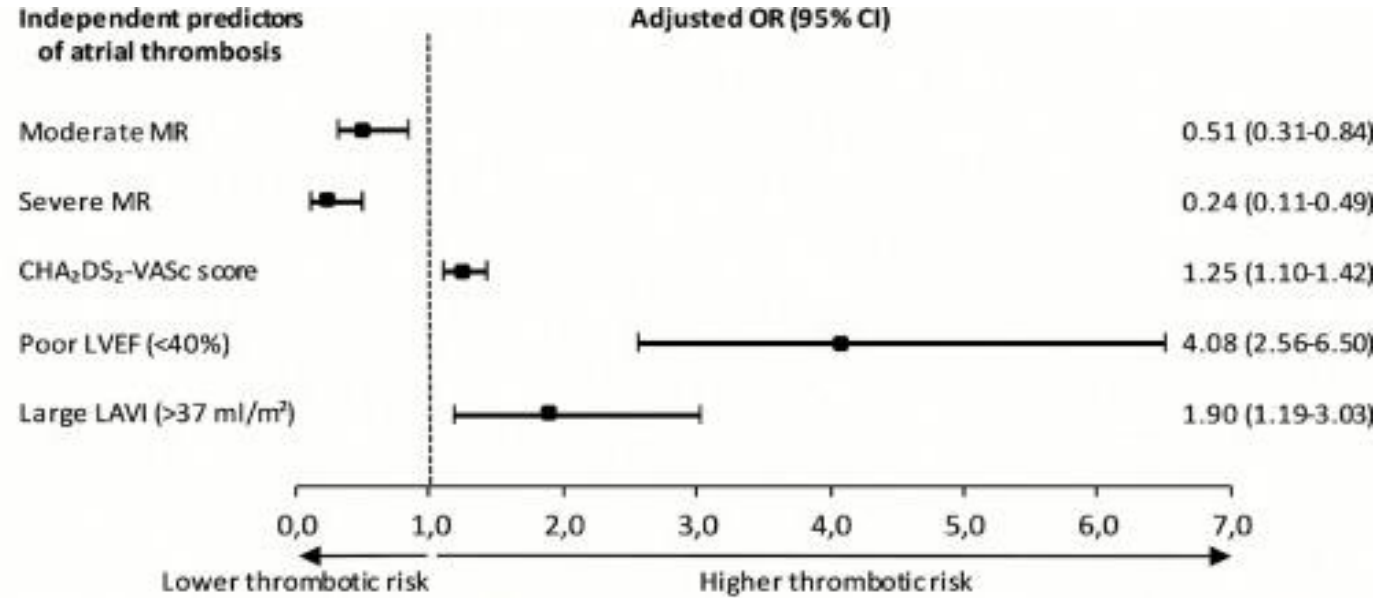
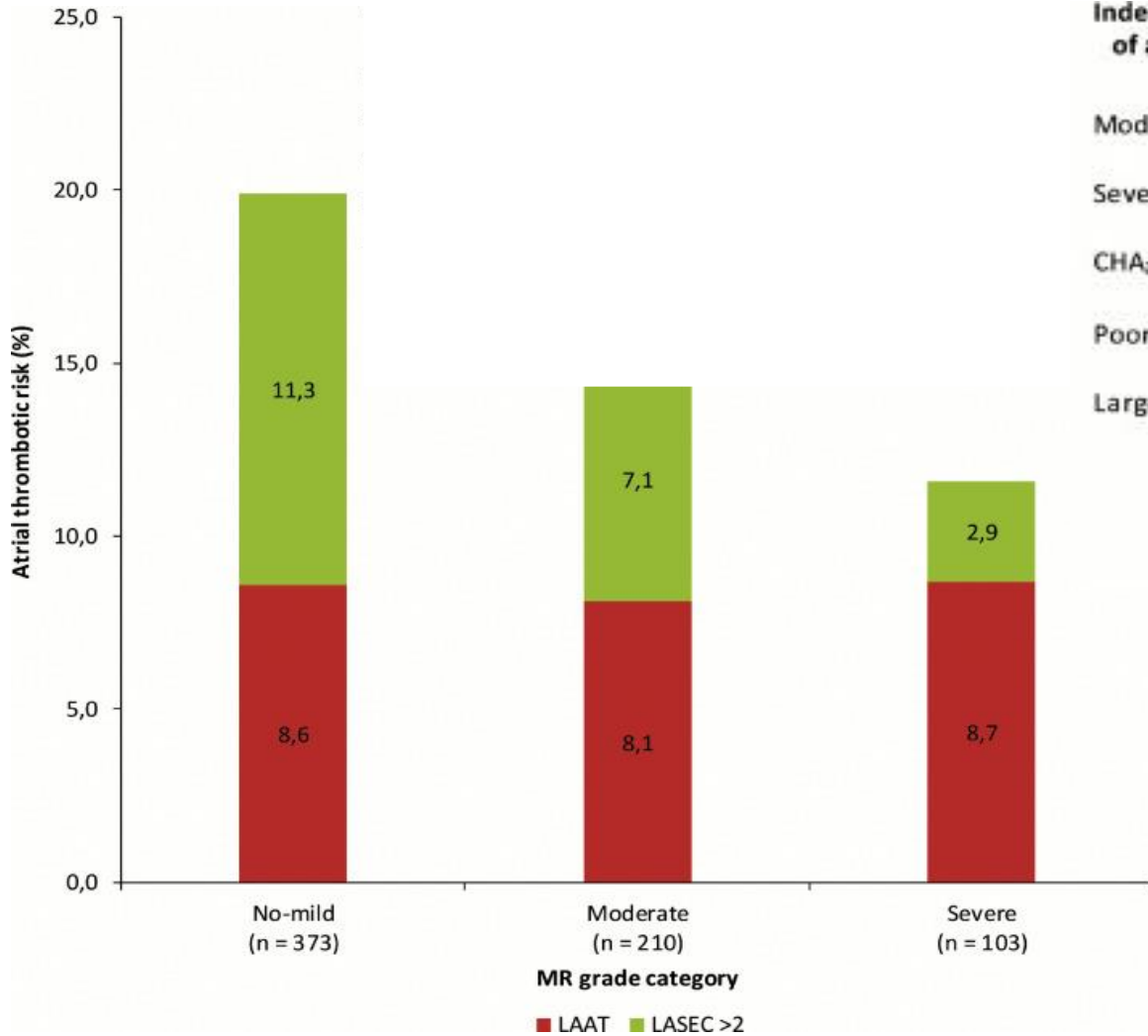
## PREVALENCE OF ATRIAL THROMBOSIS ACCORDING CHA<sub>2</sub>DS<sub>2</sub>-VASC SCORE

- TEE revealed atrial thrombosis (LAAT and/or LASEC >2) in 118 patients (17%).
- LAAT was observed in 58 patients of which 46 also showed LASEC >2.
- LASEC >2 without LAAT was observed in 60 patients.



CHA<sub>2</sub>DS<sub>2</sub>-VASC: Low = 0-1; Intermediate = 2-3; High >3

# PREVALENCE OF ATRIAL THROMBOSIS ACCORDING TO MITRAL REGURGITATION



# INDIPENDENT PREDICTORS OF ATRIAL THROMBOSIS

Predictors	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
CHA <sub>2</sub> DS <sub>2</sub> -VASc score	1.28 (1.14-1.44)	1.25 (1.10-1.42)
Moderate MR vs no-mild MR	0.73 (0.47-1.16)	0.51 (0.31-0.84)
Severe MR vs no-mild MR	0.53 (0.28-1.02)	0.24 (0.11-0.49)
Poor LVEF (<40%)	4.26 (2.78-6.52)	4.08 (2.56-6.50)
Large LAVI (>37 ml/m <sup>2</sup> )	1.97 (1.29-3.03)	1.90 (1.19-3.03)

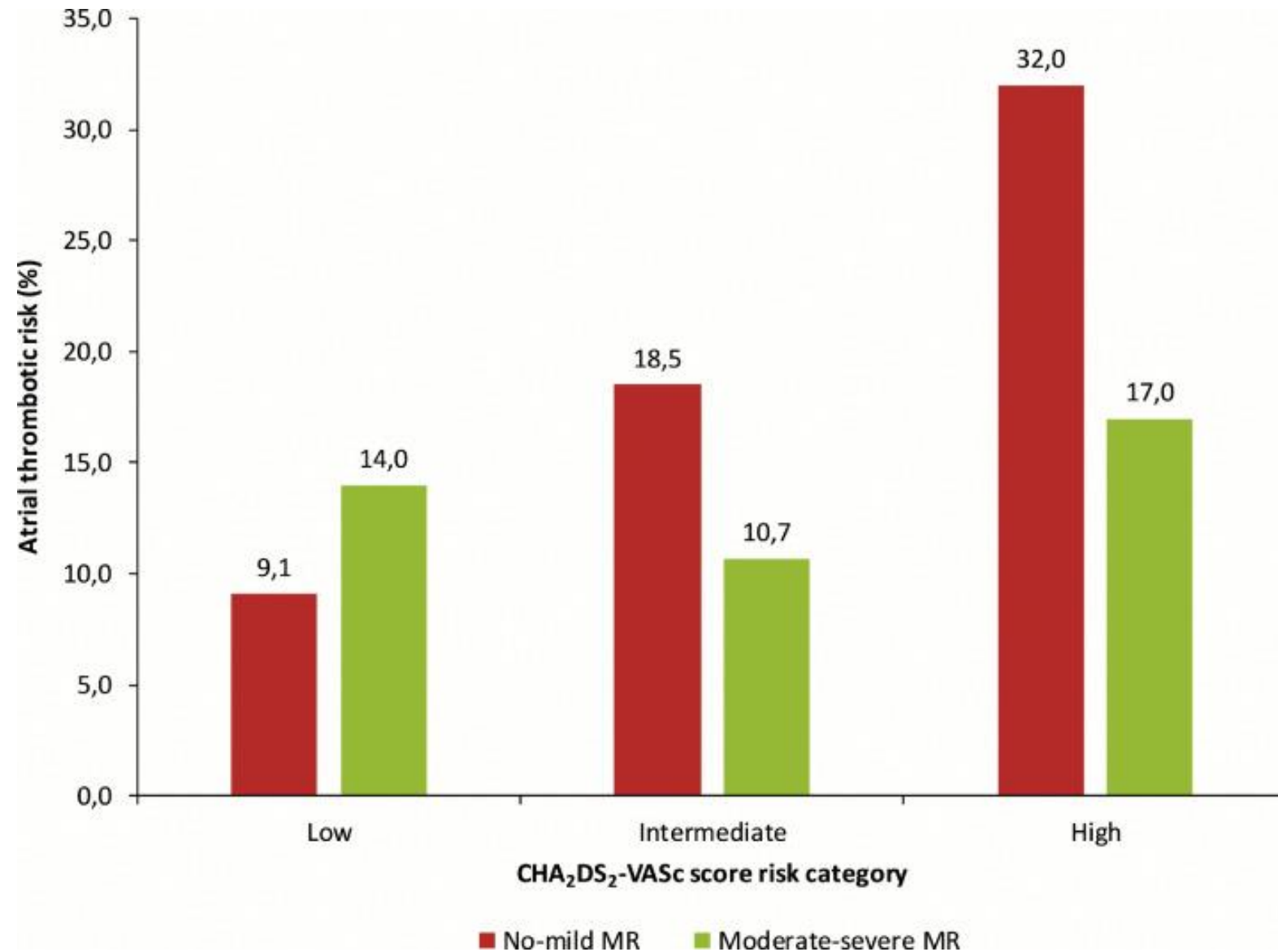


# ADJUSTED ODDS RATIO FOR MODERATE-SEVERE MITRAL REGURGITATION VERSUS NO-MILD MITRAL REGURGITATION FOR DIFFERENT SUBGROUPS

Predictors	Adjusted OR Moderate-severe MR versus no-mild MR	95% lower CI	95% upper CI	p value*
CHA <sub>2</sub> DS <sub>2</sub> -VASc score				0.35
Low	0.88	0.30	2.61	
Intermediate	0.39	0.18	0.83	
High	0.36	0.19	0.69	
LA dimension				0.39
LAVI ≤37 ml/m <sup>2</sup>	0.55	0.25	1.22	
LAVI >37 ml/m <sup>2</sup>	0.36	0.20	0.63	
LV function				0.83
LVEF <40%	0.44	0.21	0.90	
LVEF ≥40%	0.39	0.22	0.71	
Anticoagulation				0.16
No	0.62	0.30	1.28	
Yes (inadequate dose)	0.32	0.18	0.58	

## PREVALENCE OF ATRIAL THROMBOSIS ACCORDING CHA<sub>2</sub>DS<sub>2</sub>- VASC SCORE STRATIFIED BY MITRAL REGURGITATION

- Patients in the intermediate CHA<sub>2</sub>DS<sub>2</sub>-VASC score risk group with a significant MR had a documented atrial thrombotic risk of 10.7% as low as in the “low risk” group.
- Patients in the low CHA<sub>2</sub>DS<sub>2</sub>-VASC score risk group but with LAVI >37 ml/m<sup>2</sup> and without significant MR had a documented high atrial thrombotic risk of 26%.



# LIMITATIONS

- ❖ No data about future cardioembolic events.
- ❖ Only patients with non-permanent AF were included, so the exact effect of MR on atrial thrombosis in patients with permanent AF could not be derived.
- ❖ Not able to assess the effect of MR chronicity on LA thrombus formation.

# CONCLUSIONS

- ❖ The presence of MR attenuates thrombotic risk in patients with nonrheumatic AF.
- ❖ If these findings could be confirmed in an unselected AF population, this parameter might be considered a new risk modifier of the CHA2DS2-VASc score and might help refine the indication and dosage of anticoagulants in AF patients.