LEFT ATRIUM REMODELING AFTER ACUTE MYOCARDIAL INFARCTION UNDERGOING PRIMARY CORONARY INTERVENTION

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Background

1. Left atrial (LA) remodelling is an important determinant of morbidity and mortality after acute myocardial infarction.

GISSI-3   Am J Cardiol 2004;93:1156-1159

2. LA volume index is an independent predictor of death or heart failure following acute myocardial infarction.

The VALIANT Echo Study; Eur Heart J 2009;30:56-65

Hazard ratio for death or hospitalization for heart failure associated with each mL/m2 increase in left atrial volume index.
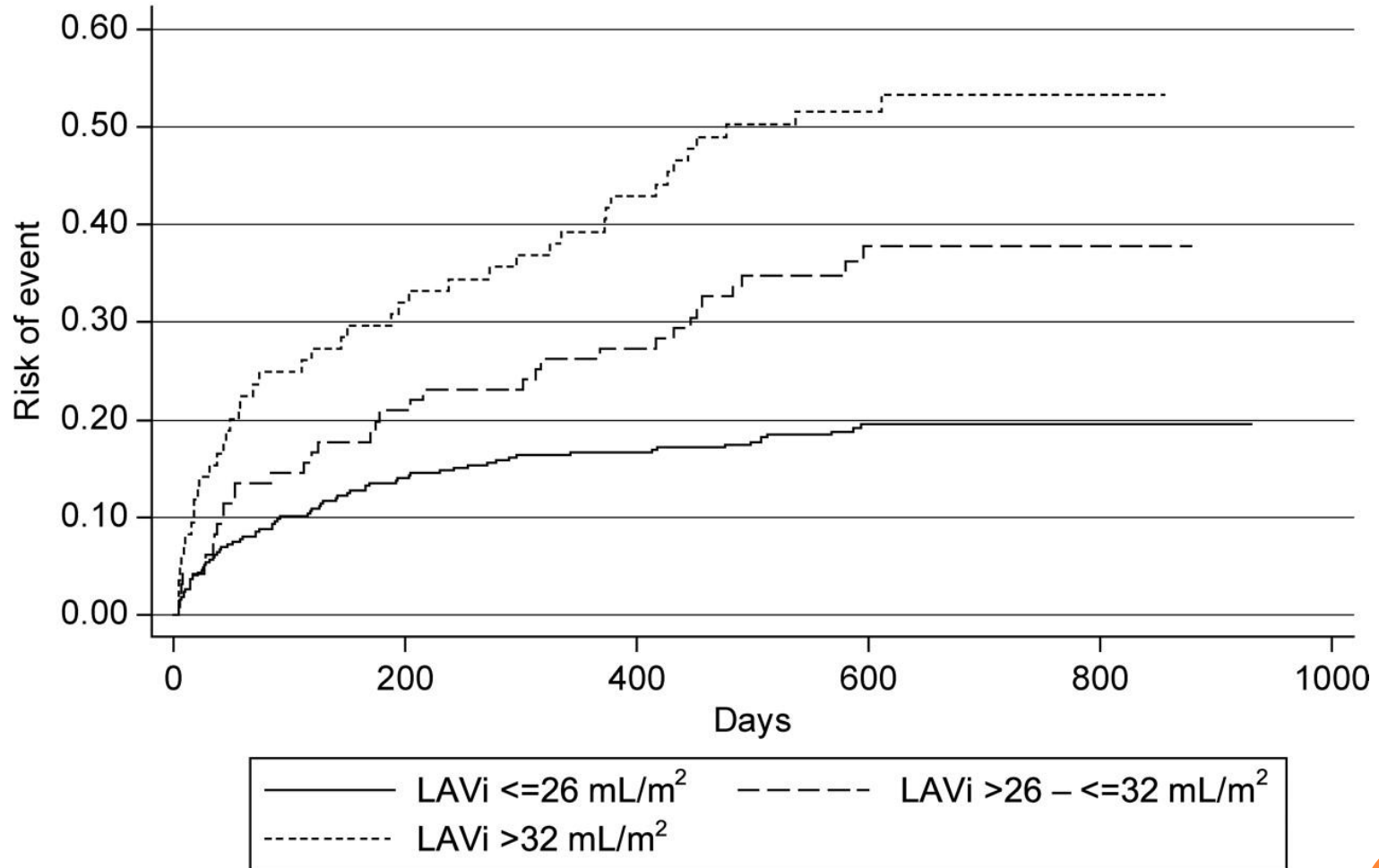

LAVi and HR for all-cause death and hospitalization for HF

Meris A et al. Eur Heart J 2009;30:56-65

European Heart Journal
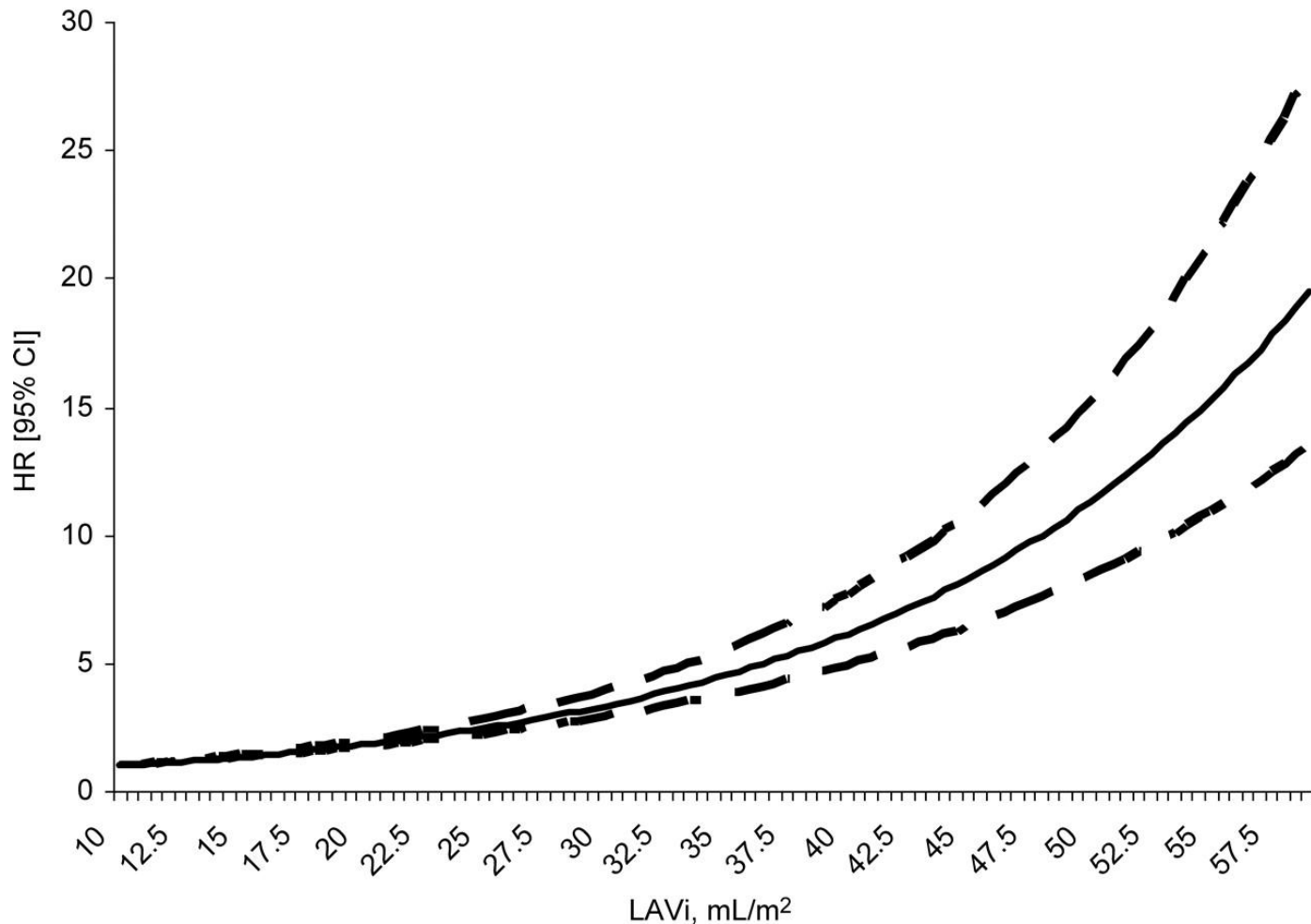
Kaplan–Meier estimates of the rate of death or hospitalization for heart failure according to baseline left atrial volume index.
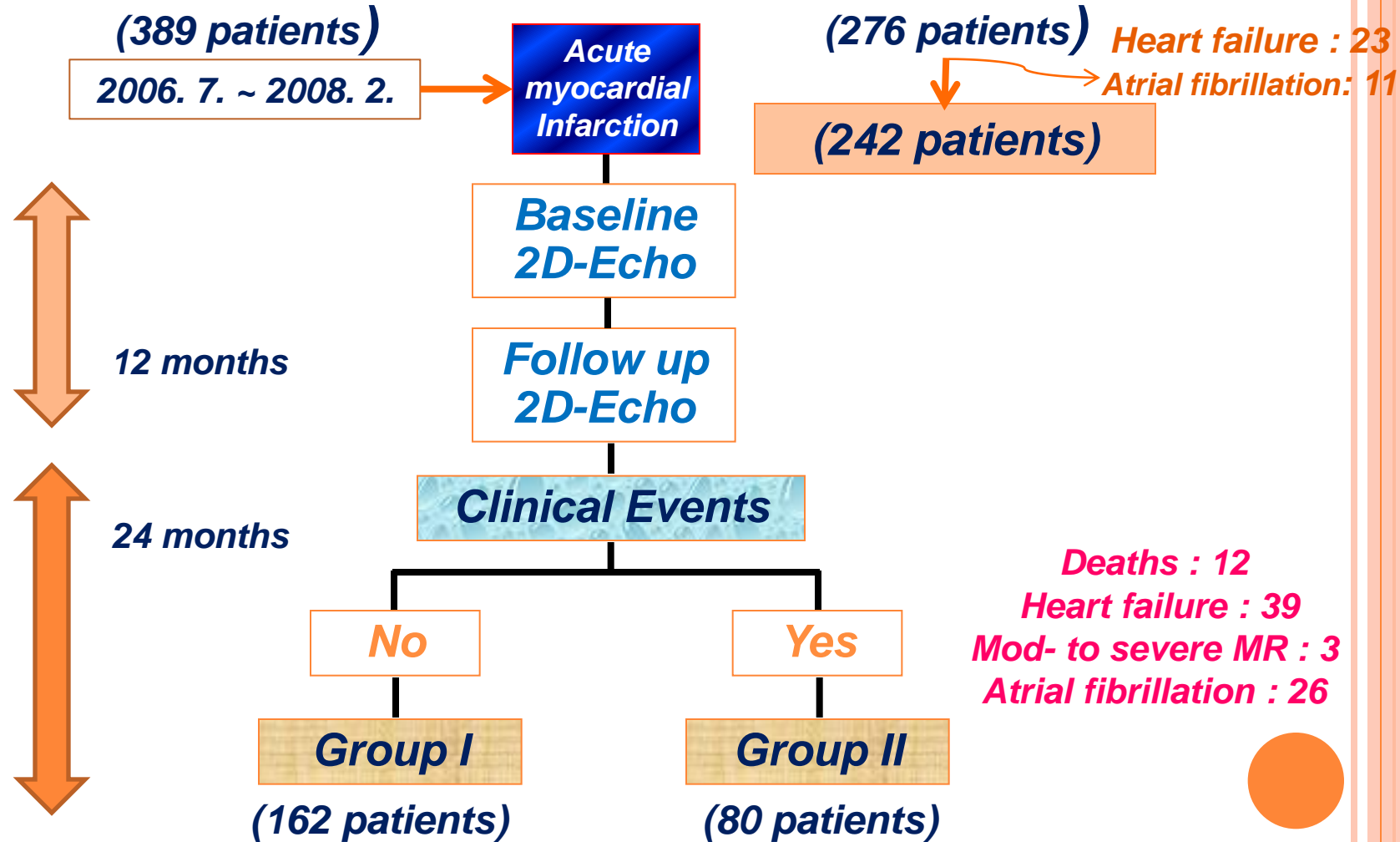

Death or hospitalization for HF according to LAVi

Meris A et al. Eur Heart J 2009;30:56-65

European Heart Journal

Objectives

1. Echocardiographic assessment of left atrial and ventricular function plays an important role in the examination of patients with adverse events after acute myocardial infarction(AMI).

2. We studied **changes in LA parameters** at 12months follow-up and assessed the relationship between LA remodelling and clinical outcome after AMI undergoing primary coronary intervention after 24 months.

Study Design

(389 patients)

2006. 7. ~ 2008. 2. → **Acute myocardial Infarction**

(276 patients) — *Heart failure : 23*
Atrial fibrillation: 11

(242 patients)

Baseline 2D-Echo

12 months

Follow up 2D-Echo

24 months

Clinical Events

Deaths : 12
Heart failure : 39
Mod- to severe MR : 3
Atrial fibrillation : 26

No → **Group I** (162 patients)

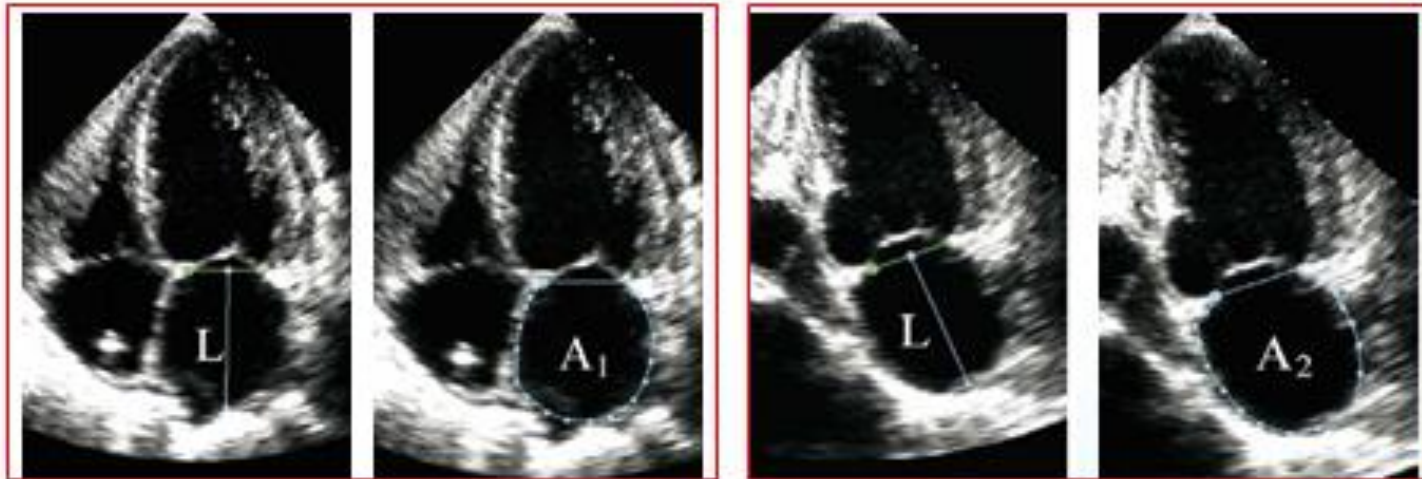Yes → **Group II** (80 patients)

Methods

1. All parameters analyzed were calculated as the mean of ≥ 2 measurements.

2. Echo finding analysis was performed by 3 expert investigators.

3. The baseline echocardiograms was performed at 24 to 48 hours from symptom onset(AMI).

4. LA remodelling was calculated by interval changes of parameters(LA size, LA volume and LA volume index).

LA volume = 8/3 π [(A1) (A2) / (L)]

※ (L) is the shortest of either the A4C or A2C length

Results

* Baseline characteristics of study population

	(N = 242)
Age (years)	63.2 ± 13.7
Male (%)	68.2
Body Mass Index	24.3 ± 3.0
Hypertension(%)	47.9
Diabetes mellitus(%)	29.3
Dyslipidemia (%)	9.1
Smoking (%)	57.9
Killip (>III)(%)	12.5

Results

* Baseline characteristics between groups

	Group Ⅰ	Group Ⅱ	p-value
Age	63.3± 11.3	63.4± 10.9	0.364
Male(%)	70.0	52.0	0.067
BMI	24.3± 2.9	23.1 ± 3.8	0.671
HTN(%)	46.5	60.0	0.202
DM (%)	29.0	32.0	0.856
Dyslipid(%)	9.2	8.0	0.433
Smoking(%)	60.0	70.6	0.129
Killip (>III)	10.7	28.0	0.033

Results

* Laboratory findings between groups

	Group I	Group II	p-value
Glucose	172.7 ± 77.6	167.9 ± 68.1	0.768
Creatinine	1.2 ± 1.1	1.2 ± 0.4	0.999
T-chol	186.0 ± 42.8	183.5 ± 40.1	0.787
LDL-chol	117.8 ± 37.1	109.8 ± 39.8	0.342
hs-CRP	0.7 ± 1.9	1.3 ± 2.7	0.238
BNP	504.6 ± 749.7	746.1 ± 533.6	0.143
CPK	1588.9 ± 1150.8	1497.9 ± 997.2	0.705
CK-MB	181.9 ± 180.4	205.7 ± 165.2	0.529
Tro-I	23.4 ± 86.1	23.8 ± 16.0	0.986

Results

* Angiographic characteristics between groups

	Group I	Group II	p-value
Site of AMI			
LAD(%)	30.0	36.0	0.534
Non-LAD(%)	64.1	68.0	0.696
Involved vessel No	1.5 ± 0.8	1.6 ± 0.9	0.428
Lesion type			
B1(%)	24.9	25.7	0.067
B2(%)	33.4	32.6	0.205
C(%)	33.8	34.1	0.113
Primary PCI(%)	95.9	94.6	0.481
Thrombolysis(%)	4.1	5.4	0.474

Results

* Echocardiographic characteristics between groups

	Group I	Group II	p-value
LV-EDV (mL)	128.7 ± 33.6	135.8 ± 37.6	0.036
LV-ESV (mL)	84.5 ± 23.7	86.8 ± 26.9	0.098
LV-EF (%)	56.9 ± 12.5	49.8 ± 13.3	0.011
WM score/16	1.16 ± 0.32	1.23 ± 0.12	0.126
LV-mass (g)	218.9 ± 66.1	226.9 ± 54.4	0.355
E wave (m/s)	0.75 ± 0.26	0.72 ± 0.29	0.665
A wave (m/s)	0.74 ± 0.32	0.91 ± 0.25	0.265
E/A wave	1.04 ± 0.82	0.82 ± 0.35	0.219
Deceleration time(ms)	193.2 ± 67.9	188.0 ± 65.4	0.747
E/E'	13.0 ± 5.6	13.9 ± 4.9	0.501

Results

* LA parameters between groups

	Group I	Group II	p-value
Baseline			
LA size(mm)	37.3 ± 3.3	40.8 ± 3.7	0.048
LA volume(mL)	34.9 ± 13.5	36.3 ± 12.0	0.047
LA volume index(mm^3/m^2)	23.7 ± 8.91	27.6 ± 3.75	0.036
Follow up(12months)			
LA size(mm)	38.8 ± 3.0	41.1 ± 3.6	0.064
LA volume(mL)	36.6 ± 13.6	40.3 ± 16.4	0.031
LA volume index(mm^3/m^2)	25.1 ± 8.12	31.1 ± 3.28	<0.001

Δ LA volume index

Group I

P = 0.089

Base | 12months

Group II

P = 0.010

Base | 12months
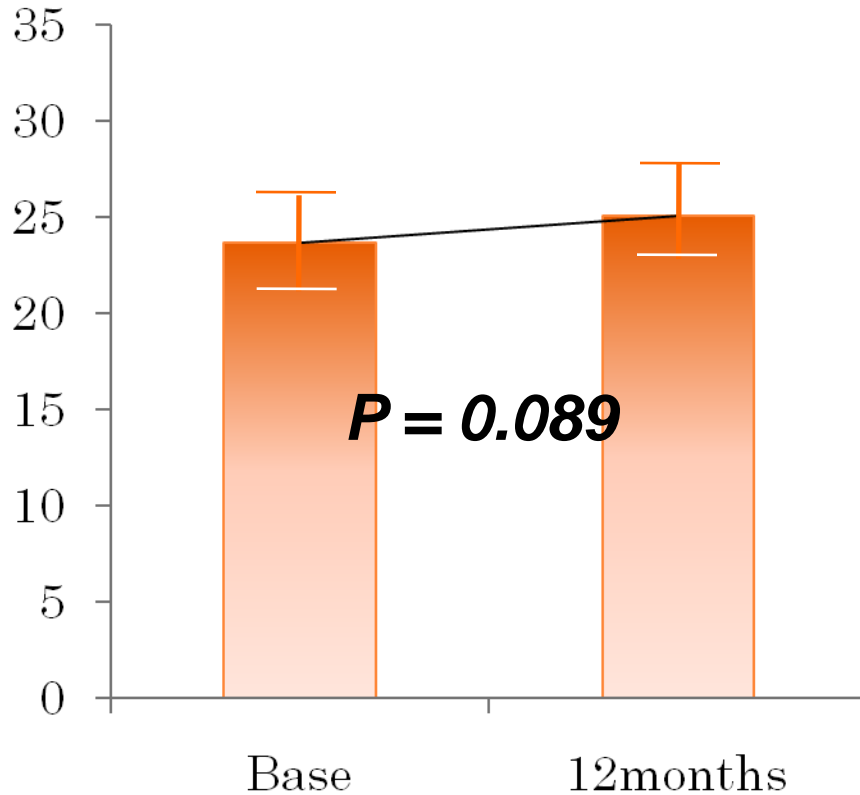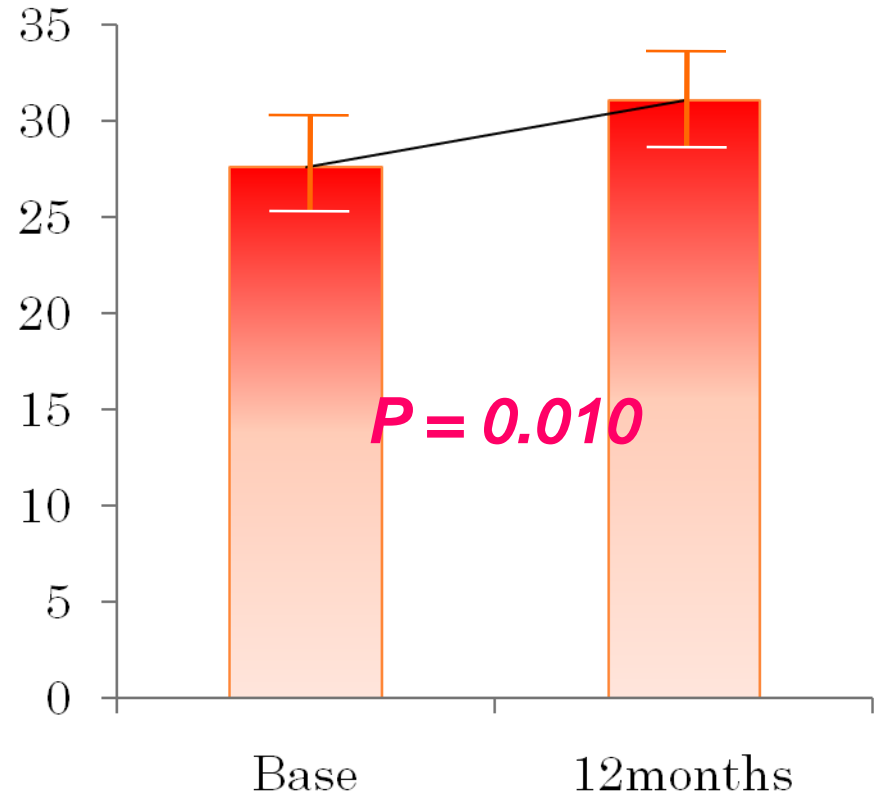
Discussion

1. Myocardial infarction results in complex alterations in ventricular and atrial architecture.

2. Experimental and clinical studies have shown that left atrial remodelliing is directly related to left ventricular remodelling.
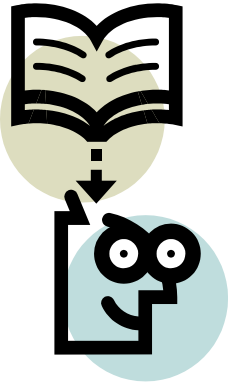
   Eur Heart J 1996;17:1646-1656

3. Myocardial ischemia results in significant LA dilatation, depressed LA systolic function, and altered LA diastolic stiffness.   *J Am Coll Cardiol* 1999;33:687-696

Study limitations

1. Single center.

2. Retrospective analysis.

3. The small number of patients.

4. A little change of planes of echocardiographic view between initial and F/U plane due to different sonographer.

Conclusions

* **Baseline LA parameters are significant predictors of death or HF hospitalization or atrial fibrillation following AMI undergoing primary PCI.**
  Moreover, LAVi and ΔLAVi as surrogate of LA remodeling after AMI undergoing primary PCI is associated with adverse outcome.

경청해주셔서
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