

BACKGROUND

- ❖ Residual lesions after tetralogy of Fallot repair (rTOF) are common. The chronic right ventricular (RV) volume overload is accepted as contributors to progressive RV remodeling.
- ❖ Ventricular remodeling rate during childhood is unclear.

STUDY AIMS

- ❖ To determine the progression of ventricular dilation after rTOF, using cardiac magnetic resonance (CMR) data in children.
- ❖ To investigate age related RV and LV volume differences in patients who did or did not require PVR.

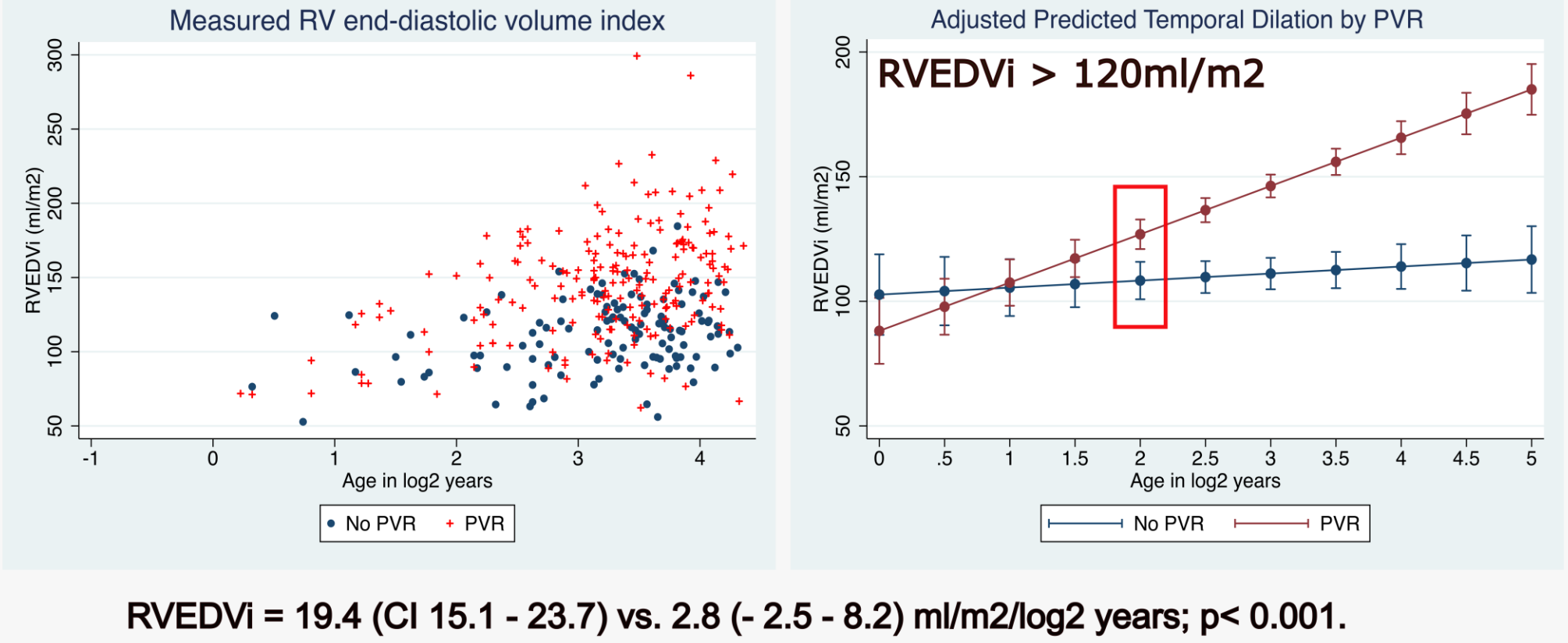
METHODS

- ❖ Single center, retrospective longitudinal study
- ❖ Patients < 21 years, TOF (primary repair before 24 months), and at least 1 CMR performed from 2000-2020.
- ❖ Exclusion criteria: Pulmonary atresia + VSD
- ❖ Linear mixed effect modeling was used to evaluate time-related changes in ventricular volumes by log-transformed age at CMR adjusted for sex and regurgitant lesion status. Patients were grouped as per need for PVR during follow-up.

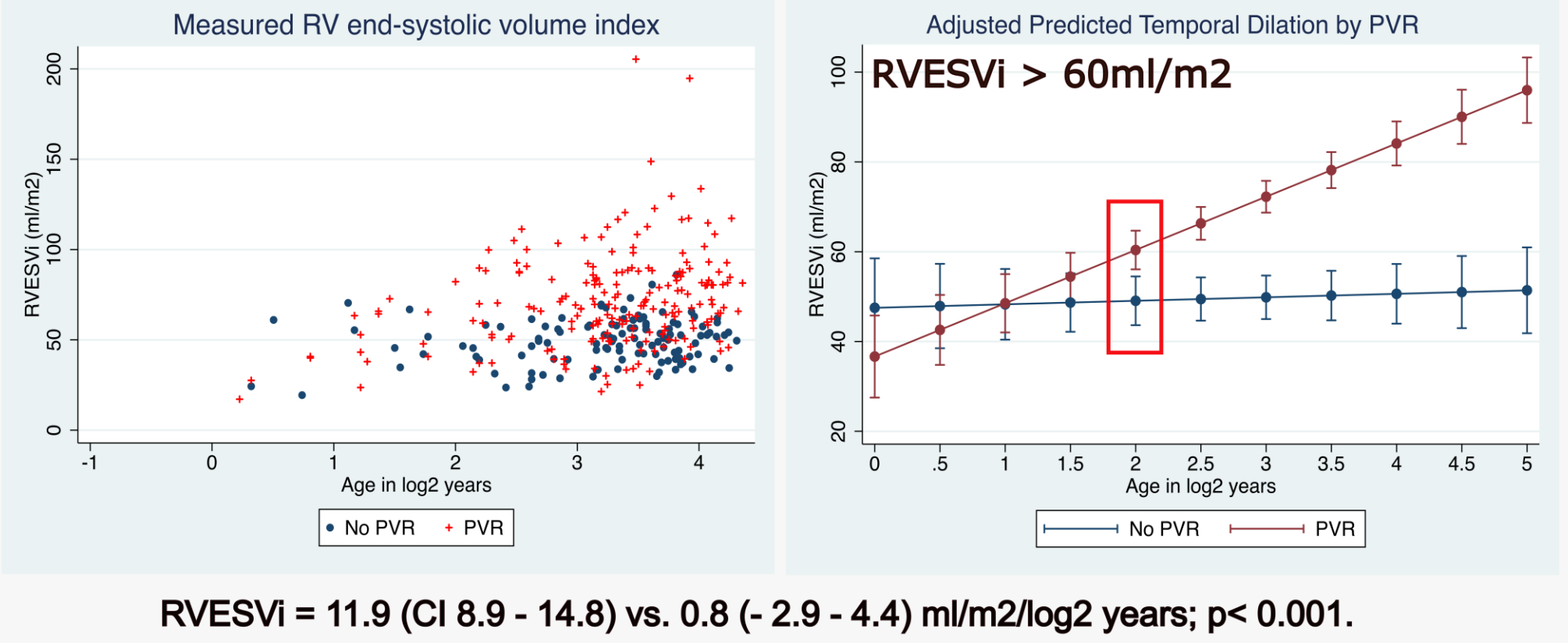
RESULTS

- ❖ 214 patients; 139 were male (64.8%), median age at primary repair was 6 months old (IQR 4-9), 49 had staged repair (22.9%).
- ❖ 142 patients (66.4%) had PVR at median age 12 years old.
- ❖ Repeated measured analysis:
- ❖ 323 CMR from 201 patients performed before PVR.
- ❖ Median age at first CMR was 9.4 years (IQR 5.9-12.3); 126 (62.7%) patients had one CMR, 34 (16.9%) had 2 and 41 (20.4%) had 3 or more.
- ❖ Serial CMR detected a faster remodeling rate (ml/m2/log2 years) on both RV and LV volumes in the group that later had PVR.
- ❖ Group of patients that later required PVR:
- ❖ By 4 years old: RVEDVi > 120 ml/m2 and RVESVi > 60 ml/m2
- ❖ By 11 years old: LVEDVi > 80 ml/m2 and LVESVi > 33ml/m2

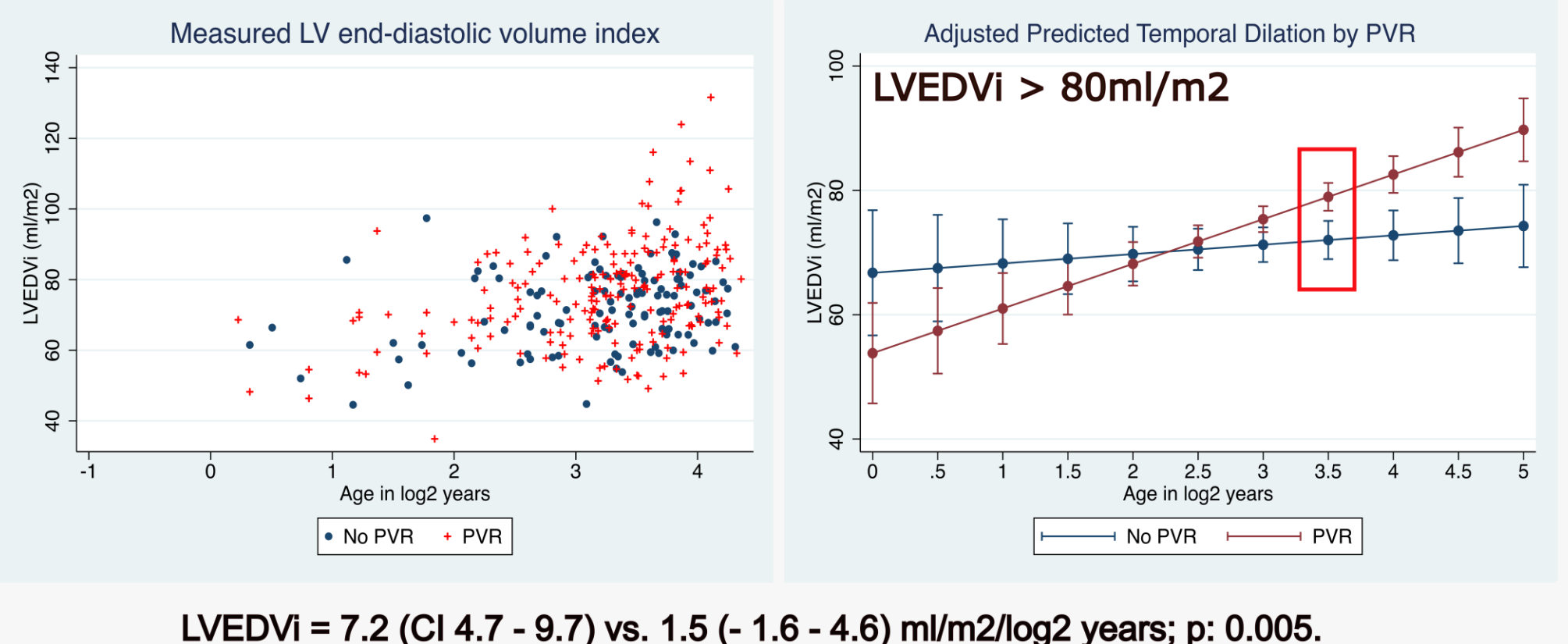
1A



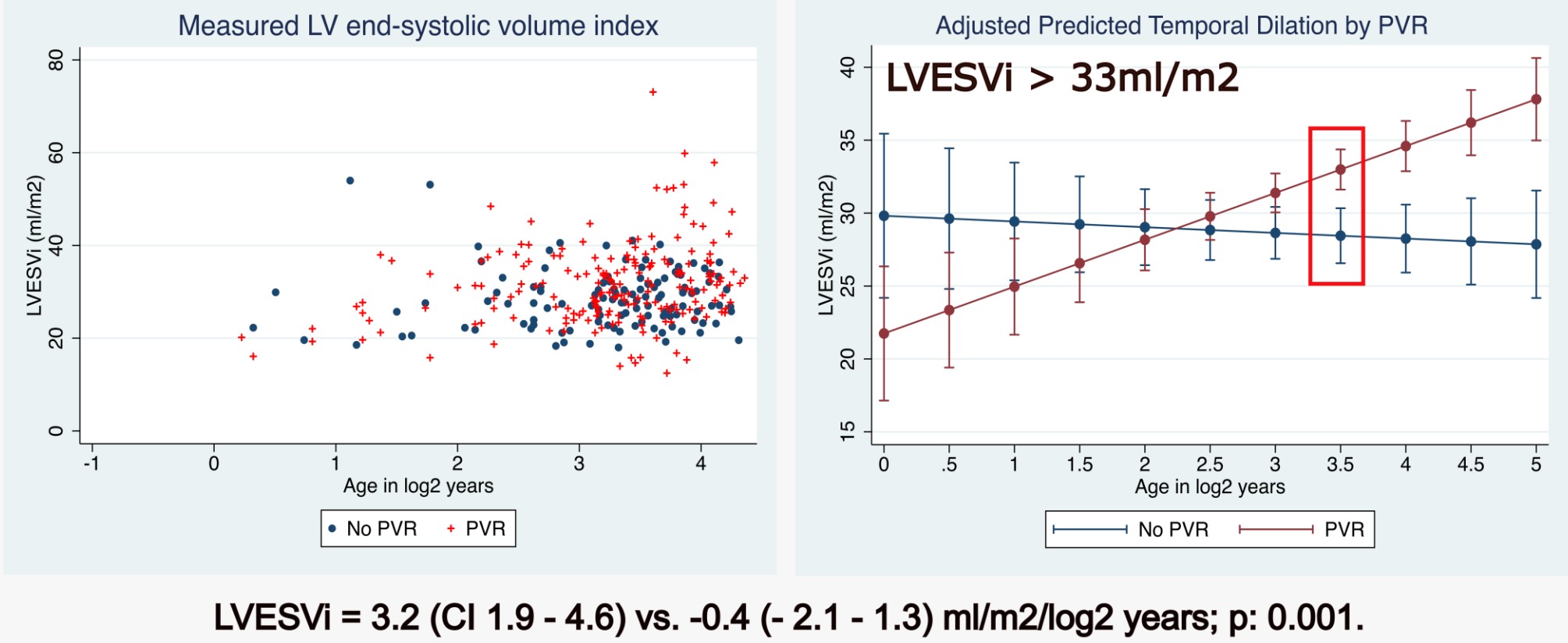
1B



1C



1D



	PVR	No PVR
Patients (n, %)	142 (66.4)	72 (33.6)
Type of primary repair (n,%) ¹		
TAP	117 (82.4)	45 (62.5)
VS	14 (9.8)	23 (31.9)
Conduit	11 (7.8)	4 (5.6)
Type of residual lesion (n, %) ²		
• Regurgitant	111 (78.1)	31 (53.4)
• Non Regurgitant	45 (28.9)	27 (46.6)
Age at PVR, years (IQR)	12 (9-15.6)	NA
Number of CMR/patient	1 (1-3)	1 (1-2)
QRS duration ECG ³	140 (120-152.5)	121.5 (102.5-136)

Continuous variables are described as median, interquartile range (IQR). Categorical data described in frequencies and proportions. P values are from Mann-Whitney-U or Fisher exact test. TAP, transannular patch; VS, valve sparing; RV-PA Conduit, right ventricle-pulmonary artery conduit.

¹ P-value<0.001 ² P-value 0.022 ³ P-value 0.0003

DISCUSSION

- ❖ Early and significantly increased progression of RV and LV dilation are identifiable by CMR in patients destined to require PVR following rTOF.
- ❖ Not only the remodeling rate but also the absolute value of RV and LV volumes identified patients that later required PVR.
- ❖ Early cardiac MRI surveillance focused on both LV and RV volumes may be helpful to identify fast progressive remodeling in this population.

REFERENCES

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DISCLOSURE INFORMATION

- ❖ The authors have no disclosures