



46<sup>th</sup>

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European Paediatric and Congenital Cardiology

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Istanbul, Turkey



# **Reversible Pulmonary Trunk Banding-VIII: Glucose-6-Phosphate Dehydrogenase Activity of Adult Goat Myocardium Submitted to Ventricular Retraining**

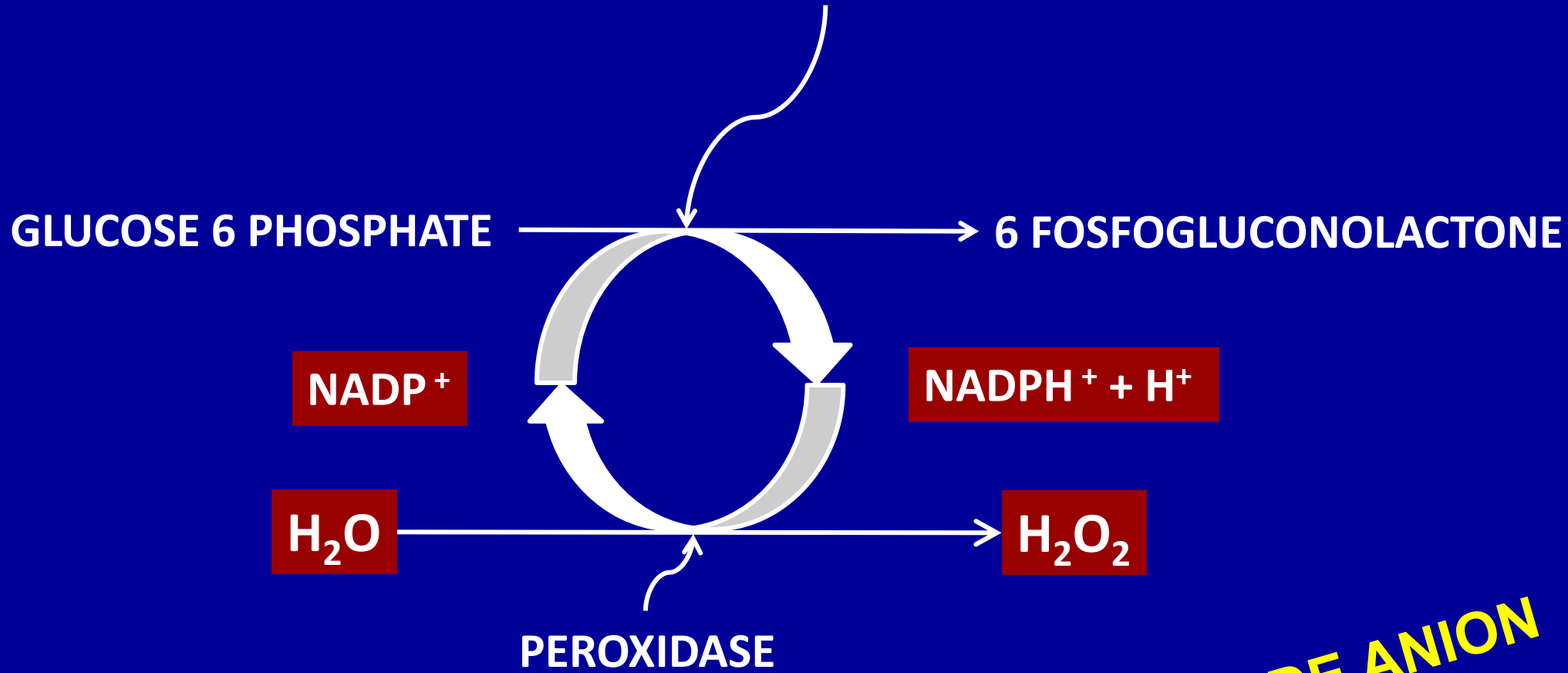
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**SÃO PAULO, BRAZIL**

**NO CONFLICT OF INTEREST**

# GLUCOSE 6-PHOSPHATE DEHYDROGENASE



**> SUPEROXIDE ANION**

# Objective

**Compare G6PD activity in 2 protocols of right ventricle systolic overload in adult goats**

# Methods

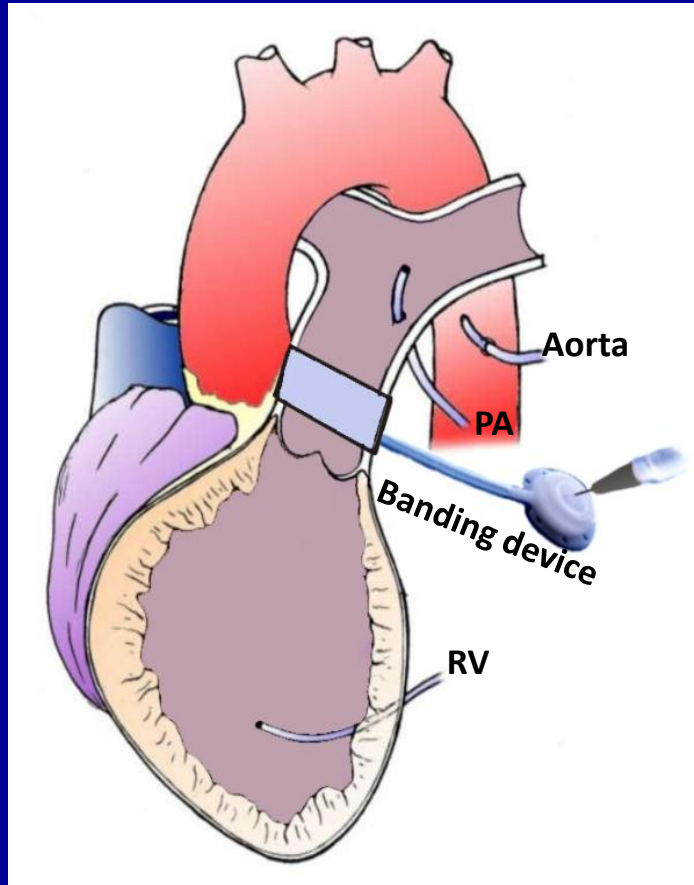
18 Adult Goats

Three Study Groups (n= 6)

Comparable Weight

| Sham         | Traditional  | Intermittent | p Value |
|--------------|--------------|--------------|---------|
| 26.42 ± 2.63 | 26.33 ± 2.32 | 25.17 ± 2.48 | 0.63    |

# Methods



# Methods

**SYSTOLIC OVERLOAD ADJUSTMENT:**

**RV TO AO PRESSURE RATIO: 0.7**

**LIMIT: 10% DROP IN SYSTOLIC BLOOD PRESSURE**

# Methods

**INTERMITTENT:**

**4 WEEKS: 12-HOUR SYSTOLIC OVERLOAD**



**ALTERNATING WITH 12-HOUR RESTING PERIOD**





# Methods

**TRADITIONAL:**

**4 WEEKS OF CONTINUOUS SYSTOLIC OVERLOAD**



# Methods

## ECHOCARDIOGRAPHIC ASSESSMENT:

- ✓ Myocardial Performance Index

# Methods

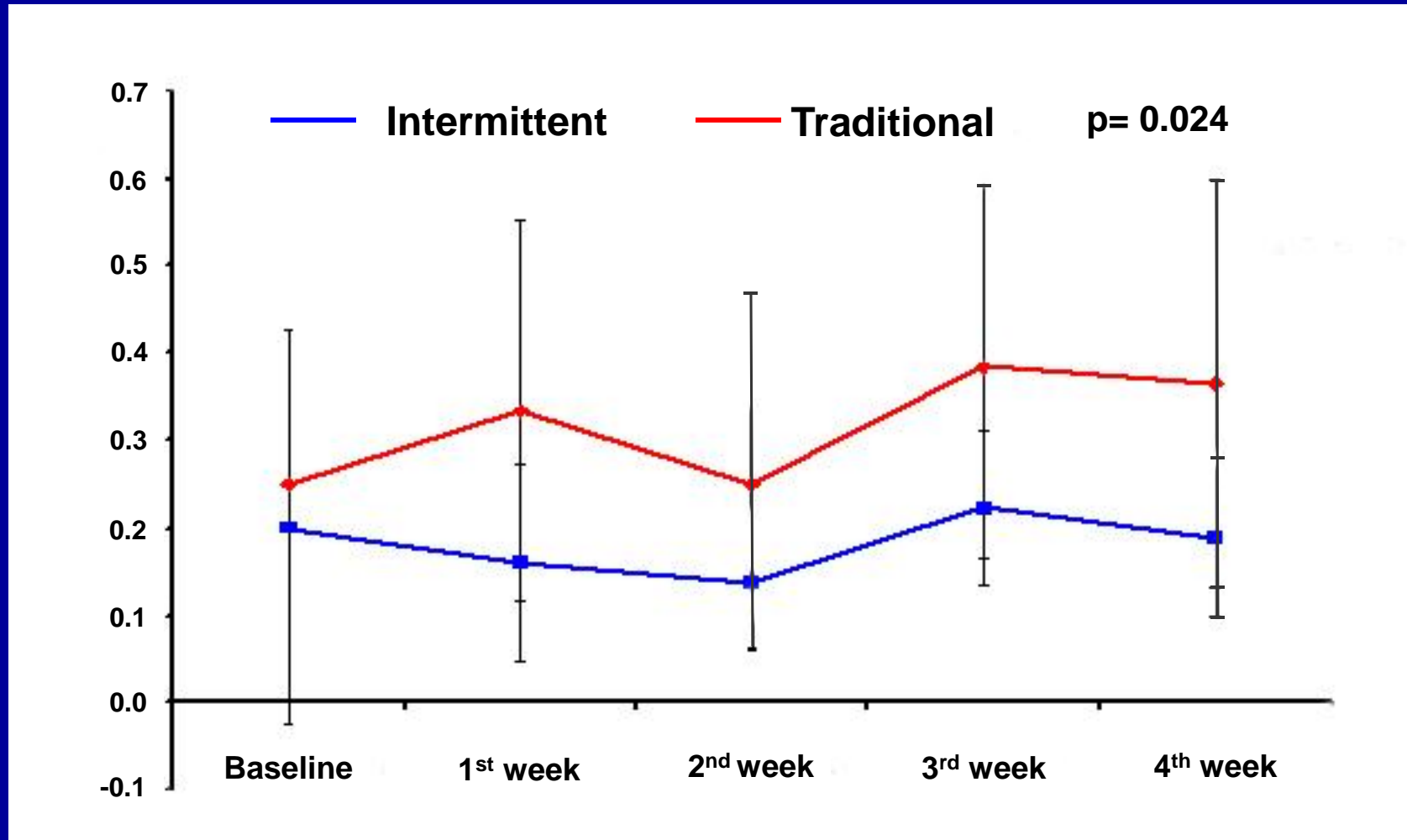
## MORPHOLOGIC ASSESSMENT:

- ✓ Cardiac Masses Weight
- ✓ Myocardial water content

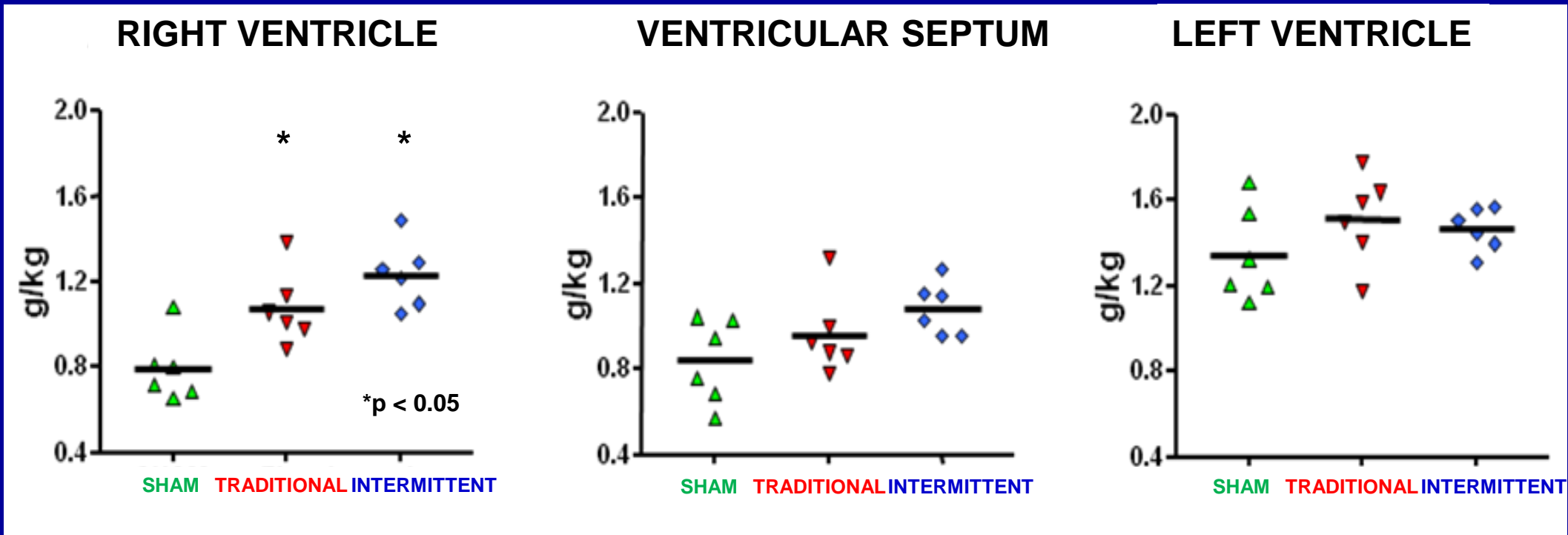
# Methods – G6PD assay

- ✓ **Myocardial samples of each cardiac chamber just after euthanasia**
- ✓ **G6PD activity: total NADPH through PPP**

# Myocardial Performance Index

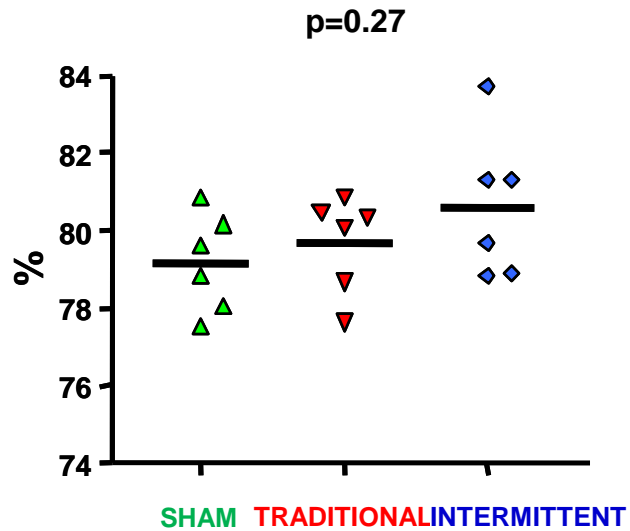


# Indexed RV weight

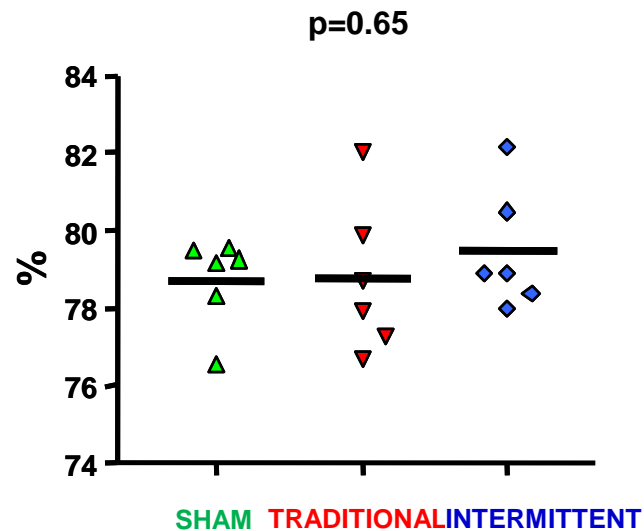


# Water Content

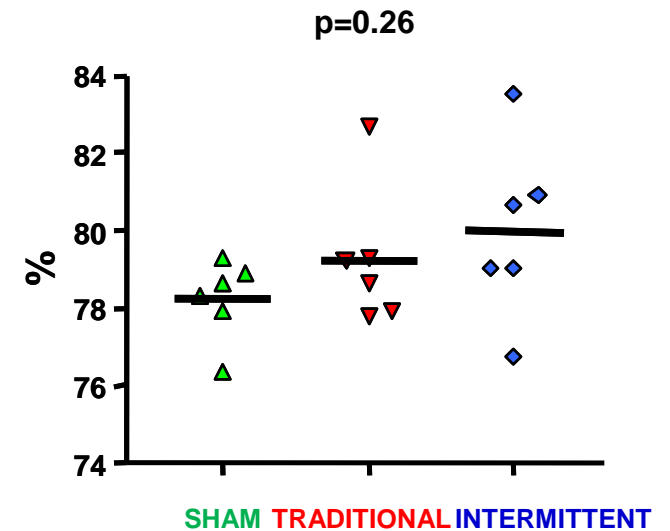
## RIGHT VENTRICLE



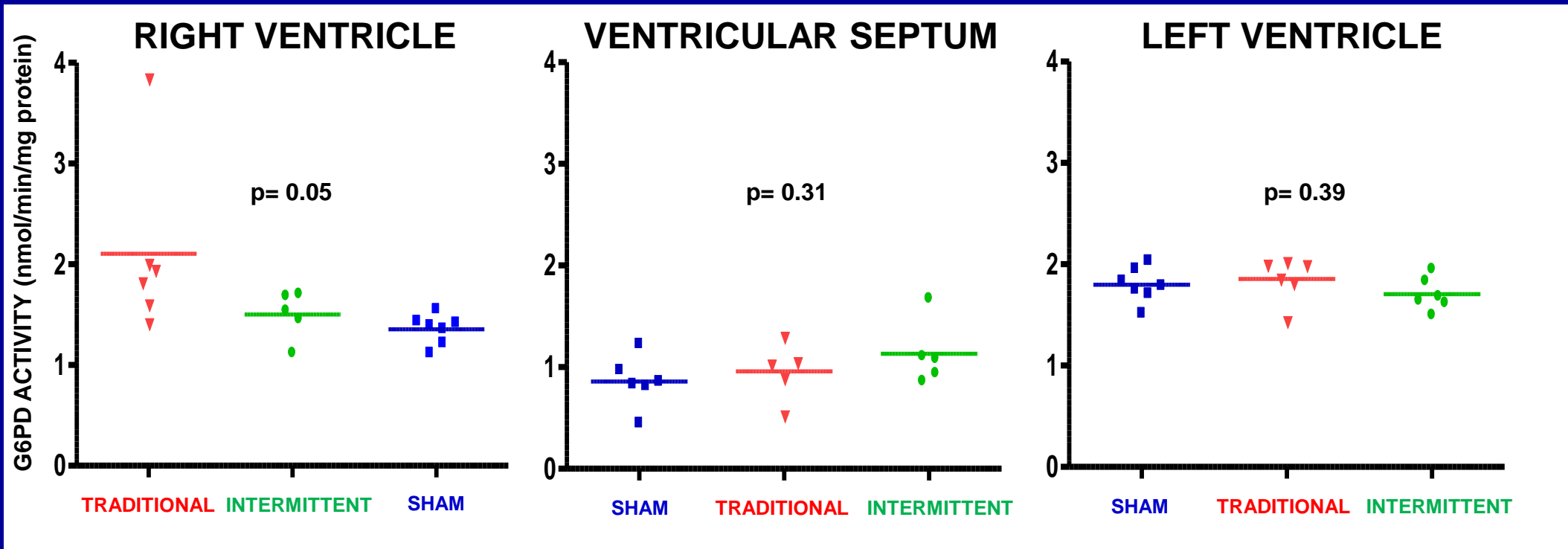
## VENTRICULAR SEPTUM



## LEFT VENTRICLE



# G6PD Activity





# Conclusions

Both study groups have developed a similar myocardial hypertrophy, despite less exposure of Intermittent group to systolic overload.

# Conclusions

Traditional systolic overload promoted upregulation of myocardial G6PD, which can elevate levels of free radicals by NADPH oxidase, an important mechanism in the pathophysiology of heart failure.

# Inferences

**Intermittent systolic overload preserves myocardial performance and may provide better results for the 2-stage Double Switch Operation of patients with failed RV in congenitally corrected TGA or after atrial baffle operations.**

**THANK YOU!**

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