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

Renato S. Assad, Leonardo A. Miana, Miriam F. Alaniz, Maria C. Abduch,
Gustavo J. Silva, Fernanda S. Oliveira, José E. Krieger, Luiz F. Moreira

Heart Institute, University of São Paulo Medical School
SÃO PAULO, BRAZIL
NO CONFLICT OF INTEREST
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

<table>
<thead>
<tr>
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<th>Sham</th>
<th>Traditional</th>
<th>Intermittent</th>
<th>p Value</th>
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<tbody>
<tr>
<td>Value</td>
<td>26.42 ± 2.63</td>
<td>26.33 ± 2.32</td>
<td>25.17 ± 2.48</td>
<td>0.63</td>
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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

Intermittent

Traditional

Baseline

1st week

2nd week

3rd week

4th week

p = 0.024
Indexed RV weight

* p < 0.05
Water Content

**RIGHT VENTRICLE**

- SHAM
- TRADITIONAL
- INTERMITTENT

**VENTRICULAR SEPTUM**

- SHAM
- TRADITIONAL
- INTERMITTENT

**LEFT VENTRICLE**

- SHAM
- TRADITIONAL
- INTERMITTENT

p-values:

- RIGHT VENTRICLE: p=0.27
- VENTRICULAR SEPTUM: p=0.65
- LEFT VENTRICLE: p=0.26
G6PD Activity

- **Right Ventricle**: p = 0.05
- **Ventricular Septum**: p = 0.31
- **Left Ventricle**: p = 0.39

G6PD Activity (nmol/min/mg protein)
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.
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!

rsassad@cardiol.br