Expression of the long non coding RNA TRDN-AS in the ischemic heart

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Background

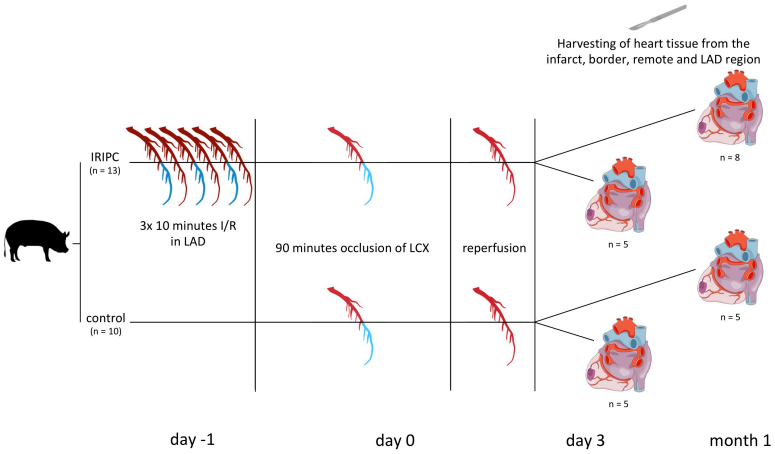
Triadin (TRDN) plays an important role in intracellular calcium homeostasis in cardiomyocytes. Alternative splicing results in the production of two isoforms (TRDN-short or cardiac isoform and TRDN-long or skeletal isoform). TRDN antisense (TRDN-AS) is a long non coding RNA (lncRNA) that is localised at the opposite strand of the protein encoding gene and overlaps with TRDN-long. Previous data showed inconclusive data on TRDN expression in failing hearts.

Purpose

The aim of our study was to evaluate expression of TRDN isoforms and TRDN-AS in a translational animal model of ischemic cardiomyopathy.

Methods

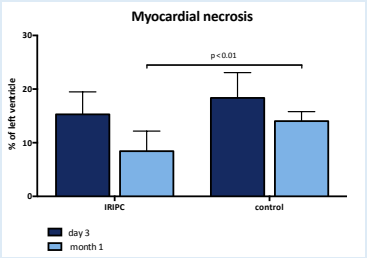
Ischemic remote intrinsic pre-conditioning (IRIPC): by 3x10 minutes ischemia and reperfusion (I/R) of the LAD followed by acute myocardial infarction (AMI) by 90min occlusion of LCX. Tissue samples from the LCX AMI, border and remote and the conditioning area (distal LAD) were collected on day 3 and month 1. TRDN-short, TRDN-long and TRDN-AS were assessed using qPCR in all myocardial regions.



Results

Scar size was significantly reduced after one month in the IRIPC group (mean ± SD: 8.4 ± 3.7%,vs 14.0 ± 1.8, p<0.01), without a difference between the groups regarding left ventricular ejection fraction.

All TRD isoforms and TRDN-AS were downregulated on day 3 in the AMI region. We observed a 17.3 times decreased expression of TRDN-AS (p=0.03) and 5.1 times decreased TRDN-long expression (p=0.03) one month and a trend towards downregulation of the TRDN-short (7.4 times) in the control group, however, in the IRIPC group no difference was observed. In the border, remote and LAD conditioning region there was no significant deregulation of TRDN, its isoforms or TRDN-AS.



Conclusion

Our in vivo translational model of reperfused AMI revealed a down-regulation of TRDN-long, TRDN-short and TRDN-AS in the infarct zone on day 3 in both groups, but only in the control group after one month, suggesting a long-term benefit of IRIPC on preservation of contractility of the infarcted area.