EFFECTS OF SK3-TYPE POTASSIUM CHANNELS MODULATORS IN MICE ATRIUM MECHANICAL ACTIVITY

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INTRODUCTION

Contractions of **cardiac cells** are due to spontaneous **depolarizations** initiated by sinoatrial node cells in the right atrium. This depolarization is caused by voltage-dependent and **voltage-independent** channels, and in the last group there are the **SK3 channels** partially responsible for **repolarization** of the action potential. These channels have been purposed as a pharmaceutical **target** for the treatment of cardiac diseases such the **Atrial Fibrillation**.

OBJECTIVES

In this study we wanted to analyse the right and left **mechanical activity** in vitro and to assess the **effect** of two drugs: **CyPPA** and **Apamin**, an agonist and an antagonist of SK3 channels, respectively. We wanted also to check if Apamin is able to block CyPPA response.

MATHERIALS AND METHODS

n = 12

Extraction of **auricular tissue**

Fig. 1. In vitro beating mice heart.

- Automatic Organ Bath
- Isometric Force Transducer
- Left atrium stimulation 2Hz

- Krebs solution
- CyPPA
- Apamin

2 PROTOCOLS REGISTERED AND ANALYSED

RESULTS

RECORDING COMPARISON

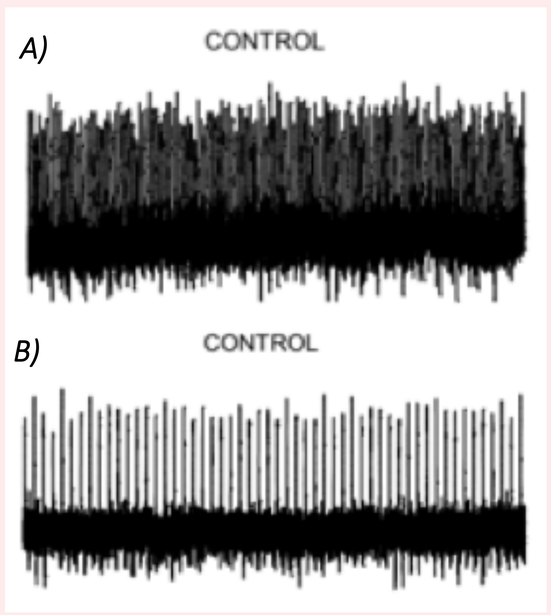

Fig. 2. Control registry comparison between right (A) and left atrium (B).

While the right atrium has a spontaneous contractions, left atrium contractions are induced artificially at 2Hz.

CyPPA: RIGHT ATRIUM RATE

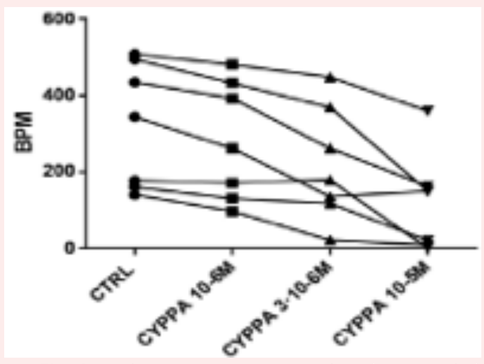

Fig. 3. Right atrium rate recording (Protocol 1).

CyPPA reduces rate contraction in right atrium, but doesn't affect to artificial induction of contraction in both protocols

CyPPA: LEFT ATRIUM AMPLITUDE

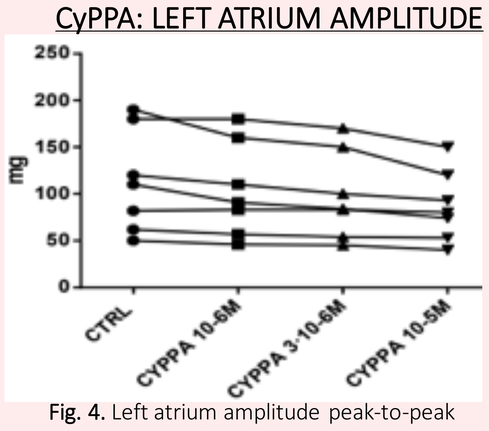

Fig. 4. Left atrium amplitude peak-to-peak recording (Protocol 1)

CyPPA reduces the peak-to-peak amplitude in both protocols

APAMIN: RIGHT ATRIUM RATE

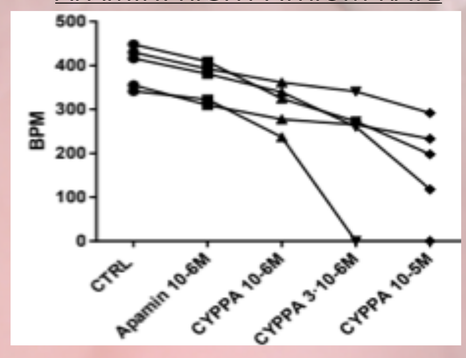

Fig. 5. Right atrium rate recording (Protocol 2)

Apamin reduces the contraction rate in the right atrium

APAMIN BLOCKAGE

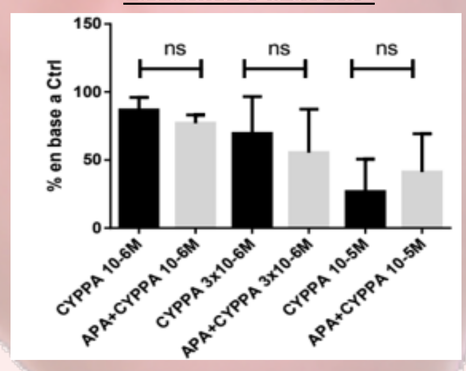

Fig. 6. Percentage of rate reduction compared to control recording with and without Apamin.

Apamin doesn't block CyPPA effect

CONCLUSIONS

- ✓ **SK3** channels have an **essential role** in atrium **myocites** and sinoatrial-node membrane **excitability**.
- ✓ **CyPPA reduces** the right atrium tissue **contraction rate** in concentration-dependent way and also its Peak-to-Peak Amplitude.
- ✓ **SK3** channels may could be a **therapeutic target** for the treatment of Atrial Fibrillation, and the Apamin could be the drug to study for it.
- ✓ An addition of a previous **Apamin** dose **doesn't block CyPPA** effect in **auricular myocites**.