Effects of severe caloric restriction from birth on the hearts of adult rats

Dirceu Padovani Mejia, Tania Regina Riu, Elizabeth Adriana Estevos, Patricia Lanza Moraes, Fernanda Oliveira Ferreira, Mariana Gavioli, Márcio Netto Magalhães Alves, Pedro William Machado Almeida, Silvia Guatimosim, Anderson José Ferreira and Marco Fabricio Dias Peixoto

Department of Biological Sciences, Federal University of Jequitinhonha and Mucuri Valleys, Diamantina, MG, Brazil.

Department of Physiology, Federal University of Jequitinhonha and Mucuri Valleys, Diamantina, MG, Brazil.

Department of Physical Education, Federal University of Jequitinhonha and Mucuri Valleys, Diamantina, MG, Brazil.

Department of Basic Sciences, Federal University of Jequitinhonha and Mucuri Valleys, Diamantina, MG, Brazil.

Department of Morphology, Federal University of Minas Gerais, Belo Horizonte, MG, Brazil.

Department Physiology and Biophysics, Federal University of Minas Gerais, Belo Horizonte, MG, Brazil.

Corresponding author: Marco Fabricio Dias Peixoto (e-mail: marcofabriufvjm@gmail.com).

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There has been increasing evidence suggesting that a severe caloric restriction (SCR) (above 40%) has beneficial effects on the hearts of rats. However, most of the reports have focused on the effects of SCR that started in adulthood. We investigated the consequences of SCR on the hearts of rats subjected to SCR since birth (CR50). From birth to the age of 3 months, CR50 rats were fed 50% of the food that the ad libitum group (AL) was fed. Thereafter, a maximal aerobic test was performed to indirectly evaluate global cardiovascular function. Indices of contractility (+dP/dt) were analyzed in isolated heart preparation, and cardiomyocyte diameter, number, density, and myo-collagen collagen content were obtained through histologic analysis. Ventricular myocytes were isolated, using standard methods to evaluate phosphorylated AKT levels, and Ca2+ handling was evaluated with a combination of Western blot analysis, intracellular Ca2+ imaging, and confocal microscopy. CR50 rats exhibited increased aerobic performance and handling.

Keywords: severe caloric restriction, heart function, cardiomyocytes, AKT signaling, Ca2+ handling

ABSTRACT

References


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