XXV Congresso de Iniciação Científica da Unicamp

October 18 to 20 Campinas | Brazil

2017

Relation of morphometry and basal lactate production in primary culture of isolated adipocytes from normotensive and hypertensive rats.

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Abstract

In addition to other factors, lactate production is associated with the adipocytes size, where larger sizes related to a higher production of this metabolite. The Wistar Kyoto strain (WKY) is heavier than Wistar and SHR rats (spontaneously hypertensive rats) and have a larger area and diameter of isolated adipocytes, thus being a possible model of investigation of this phenomenon. In this pilot study, baseline lactate production in these three strains was verified in primary culture of isolated adipocytes, assuming a higher production in WKY. The results obtained show that there are no differences in lactate production between them.

Key words: Adipocytes, lactate, rats

Introduction

Isolated adipocytes are excellent research tools for energy metabolism (1). One of its functions is lactate production, which is involved with regulating energy for the organism and substrate for gluconeogenesis in the liver (2). Lactatemia, on the other hand, is also linked to the adipocytes size. The relationship between lactate production and adipocyte size, according to Digirolamo (3), is presented in a positive and significant way, with larger adipocytes being associated with a higher lactate levels in the blood. The Wistar-Kyoto (WKY) strain presents fasting glycemia similar to the SHR (spontaneously hypertensive rats) and Wistar rats (4, 8), indicating that the blood glucose is not the determining factor for possible differences in lactate production between these strains. However, the highest weight found in WKY compared to Wistar and SHR (W: 496.8 ± 6.01 ; WKY: 563.6 ± 14.84 , SHR: 274.1 ± 7.466) (5, 6) and greater area and diameter of their adipocytes (7) may be indicative of higher lactate production, matching with the Digirolamo studies. We aimed to investigate whether this relationship is also evident in the comparison of WKY with the SHR and Wistar strains in primary isolated adipocyte culture from the epididimal panicles of these rats.

Results and Discussion

Figure 1. Basal lactate production of primary culture from isolated adipocytes for W, WKY and SHR at the 15th week of life (W vs WKY $p > 0.05$ and WKY vs SHR $p > 0.05$).

In this pilot study, 11 rats of each strain with 15 weeks of life were tested in normal by Kolmogorov-Smirnov and

applied to Student's *t*-test (parametric data) and Mann-Whitney (non-parametric). The results showed that basal lactate production between the WKY and Wistar strains did not differ and the same relation was found in the comparison of SHR with their control (WKY: 0.87 ± 0.04 , Wistar: 0.83 ± 0.06 , SHR: 0.89 ± 0.17).

Conclusions

In this pilot study, the influence of weight and the largest area of adipocytes in WKY panicles on lactate production was not observed when compared to SHR and Wistar strains.

Acknowledgement

FAPESP, FAEPEX, CAPES, SAE, PIBIC - CNPQ

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DOI: 10.19146/pibic-2017-78164

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