

## Behaviour of Blood Glucose Diabetes Type 2 on the Cardiac Stress Test: A New Paradigm? What is its Importance?

Jonathan Nicolas dos Santos Ribeiro<sup>1,3\*</sup>, Jessica Aimée Lins de França<sup>1</sup>, Maria de Fátima Monteiro<sup>2</sup>, Cláudio Barnabé dos Santos Cavalcanti<sup>1</sup> and Denise Maria Martins Vancea<sup>1,3</sup>

<sup>1</sup>DOCE VIDA: Program of Supervised Physical Exercise for Diabetics, Superior School of Physical Education, University of Pernambuco, Brazil

<sup>2</sup>Cardiac Emergency Hospital of Pernambuco, University of Pernambuco, Brazil

<sup>3</sup>Master's Program in Physical Education, Federal University of Pernambuco, Brazil

### Introduction

Cardiac Stress Test (CST) is a maximal exercise test inexpensive, wide applicability and effectiveness tests in analysis with diabetics [1]. During a brief maximal exercise embodiment hepatic glucose production increases from two to five times increasing the glucose levels [2,3]. To analyze the behavior of blood glucose of type 2 diabetics during exercise testing.

### Methods

Pre-experimental design study, duly approved by the Ethics Committee No. 775654. Through a sample test were selected 51 diabetic patients of both genders, aged between 50 and 70 years who did not use insulin therapy and/or use of beta-blocker drugs. The CST was carried out under the supervision of a medical cardiologist, in the morning, with a maximum interval of two hours between the last meal. A treadmill with incline option was used, obtaining the electrocardiographic recordings were used via 12-lead system, and protocols were selected individually [4]. The capillary glycemic (CG) was measured before and immediately after every effort obtained in CST [5]. Statistical analysis was performed using the Wilcoxon test and Spearman correlation, adopting a significance level of  $p=0.05$ .

### Results

CG rate above 150 mg/dL was 52.9%. The behavior of the CG immediately after every effort obtained in CST, showed a significant decline ( $175.2 \pm 83.2$  vs  $159.6 \pm 78.2$   $p=0.00$ ) (Figure 1). Of the 51 patients 33% were with blood glucose values above 200 mg/dL (Figure 2). The heart rate (HR) Maximum evaluated showed significant correlations compared to the percentage of effort made ( $153.0 \pm 12.6$  vs  $97.1 \pm 6.2\%$   $rs=0.78$   $p=0.00$ ), with the HR submaximal expected ( $153.0 \pm 12.6$  vs  $133.2 \pm 7.0$   $rs=0.55$   $p=0.00$ ), and the maximal HR for ( $153.0 \pm 12.6$  vs  $157.3 \pm 8.3$   $rs=0.56$   $p=0.00$ ).

### Conclusion

CG behavior presented itself contrary to the vast majority of existing literature. Apparently the action of exercise on CST and

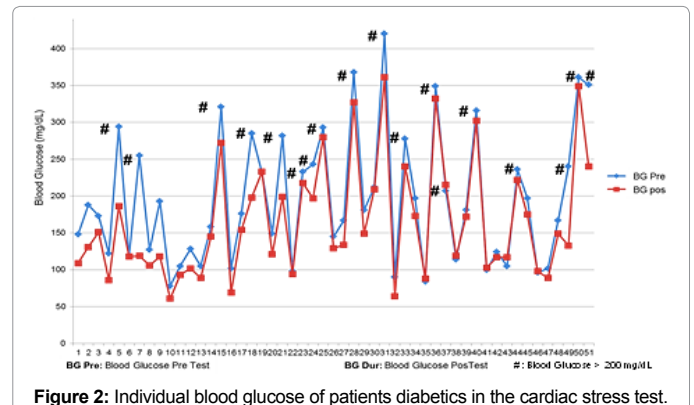


Figure 2: Individual blood glucose of patients diabetics in the cardiac stress test.

the route of independent glucose uptake of insulin are effective for descendants glycemic responses, even in blood glucose values above contraindicated for physical effort. However more studies are needed to investigate possible mechanisms responsible for this outcome. It also needs attention the realization of the extent of CG before and after CST, since the discrepancy (hyperglycemia/hypoglycemia) glucose levels by diabetics presented before the CST in order to avoid potential acute clinical complications related to diabetes.

### References

- Boer-Martins L, Figueiredo VN, Demacq C, Martins LC, Consolin-Colombo F, et al. (2011) Relationship of autonomic imbalance and circadian disruption with obesity and type 2 diabetes in resistant hypertensive patients. *Cardiovasc Diabetol* 10: 1-12.
- Hultman E (1967) Studies on muscle metabolism of glycogen and active phosphate in man with special reference to exercise and diet. *Scand J Clin Lab Invest* 19: 1-63.
- Wahren J, Felig P, Ahlborg G, Jorfeldt L (1971) Glucose metabolism during leg exercise in man. *J Clin Invest* 50: 2715-2725.
- Meneghelo RS, Araújo CGS, Stein R, Mastrocolla LE, Albuquerque PF, et al. (2010) Sociedade Brasileira de Cardiologia. III Diretrizes da Sociedade Brasileira de Cardiologia sobre Teste Ergométrico. *Arq Bras Cardiol* 95: 1-26.
- Hortensius J, Slingerland RJ, Kleefstra N, Logtenberg SJJ, Groenier KH, et al. (2011) Self-Monitoring of Blood Glucose: The Use of The First or The Second Drop of Blood. *Diabetes Care* 34: 556-560.

\*Corresponding author: Jonathan Nicolas dos Santos Ribeiro; Rua Dagoberto Pires, nº 216, 51010-140, Brasília Teimosa, Recife, PE, Brazil, Tel: +55 81 99221-3748; E-mail: [jonathannicolas01@gmail.com](mailto:jonathannicolas01@gmail.com)

Received: June 21, 2016; Accepted: June 28, 2016; Published: June 30, 2016

Citation: Santos Ribeiro JN, Lins de França JA, Monteiro MF, Santos Cavalcanti CB, et al. (2016) Behaviour of Blood Glucose Diabetes Type 2 on the Cardiac Stress Test: A New Paradigm? What is its Importance? *Diabetes Case Rep* 1: 108. doi: 10.4172/2572-5629.1000108

Copyright: © 2016 Santos Ribeiro JN, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

