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Adenosine Receptor Transcriptomic Profile in Cardiac Tissue of a Zucker Rat Model

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ABSTRACT

To evaluate the possible variations of adenosine receptor (AR) profile together with *TNF-α* and *IL-6* mRNA in cardiac tissue of obese Zucker rats (OZR) during fasting conditions (*fc*) and during the induction of acute hyperglycemia (*AH*). OZR (*O*, *n*=21) and age-matched lean control rats (*CO*, *n*=18) were studied during *fc* (*CO_{fc}*, *n*=8; *O_{fc}*, *n*=13) and during the induction of *AH* (*CO_{AH}*, *n*=10; *O_{AH}*, *n*=8). The histopathologic analysis performed on *O* and *CO* heart samples did not show abnormalities of myocardial structure. The AR transcriptomic profile was analyzed in *O* and *CO* by real-time polymerase chain reaction (PCR) and a significantly lower mRNA expression was observed for *A_{2A}R* in *O* with respect to *CO* (*p*=0.047), while a significant upregulation was observed for *A₃R* in *O* with respect to *CO* (*p*=0.002). No significant differences between *O* and *CO* were observed for *TNF-α* or *IL-6*. Correlations were found between glycemia and *A₁R* (*p*=0.03) and *A_{2B}R* (*p*=0.002); total cholesterol and *A_{2B}R* (*p*=0.02) and *A₃R* (*p*=0.0002), as well as between *IL-6* and *A₁R* (*p*=0.05) and *TNF-α* and *A_{2A}R* (*p*<0.0001). The modulation of ARs in these settings could represent a promising approach to pharmacological treatment, which must be supported by diet restrictions and physical exercise.

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