

CERTIFICATE

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The participation and presentation at the conference was equivalent to 4 ECTS.

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Investigation of the relationship between cardiolipin and prediabetes induced cardiac damage

Introduction: Prediabetes is a symptomless disease which mostly remains unrecognised. Prediabetes induces cardiac damage, which involves mitochondrial dysfunction. One of the main components of the mitochondrial inner membrane is cardiolipin. The cardiolipin level decreases in diabetes mellitus correlated to diabetic myocardial damage. Our work aimed to examine the relationship between prediabetes induced cardiac damage and cardiolipin levels.

Methods: We used 16 male Wistar rats. The rats were divided into two groups. The control group received a normal diet while the fructose-fed group received 60% fructose-supplemented chow for 24 weeks. During the experiment, we measured fasting blood sugar levels and oral glucose tolerance. In the 24th week, animal hearts were isolated and cardiac functions were examined by working heart perfusion. With mass-spectrometry, we determined cardiolipin levels in the myocardium.

Results: The results of fasting blood sugar monitoring and oral glucose tolerance test showed slightly but significantly elevated values due to fructose feeding indicating the development of the prediabetic condition. The isolated working heart perfusion revealed diastolic dysfunction in the fructose-fed group. With mass-spectrometry, we detected decreased cardiolipin levels due to the increased fructose intake compared to control group ($28,1 \pm 2,1$ vs. $37,8 \pm 2,1$). We detected significant cardiolipin remodelling in the fructose-fed group. Cardiolipin is essential in mitochondrial and myocardial function so the defect of this molecule indicates myocardial dysfunction.

Conclusions: Fructose enriched diet indicates decreasing cardiolipin levels and cardiolipin remodelling, which cause mitochondrial dysfunction. Our results show that the decreased amount of cardiolipin can play an important role in prediabetes induced cardiac damage.

Keywords: cardiolipin, remodeling, prediabetes, oral glucose tolerance test, mass-spectrometry

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