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EPA AND DHA INFLUENCED DIFFERENTLY THE MRNA EXPRESSION LEVELS OF SOME LIPOLYSIS-RELATED FACTORS IN SUBCUTANEOUS AND VISCERAL RABBIT ADSCS *IN VITRO*

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Summary

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It is well known that the development of metabolic syndrome (MS), visceral obesity, insulin resistance, and related consequences like hypertension, dyslipidaemia, cardiovascular diseases are due to disturbed adipose tissue metabolism. While adipose-derived stromal vascular cells (or subsequently adipose-derived stem cells - ADSCs) possess multipotent properties, their proper functionality is essential for further prevention of metabolic disorders because those cells are implemented in adipogenesis and production of adipose-derived cytokines, hormones and metabolites. In the current study we explored the effects of two n-3 LC-PUFAs (DHA – docosahexaenoic; C22:6, n-3 and EPA - eicosapentaenoic; C20:5, n-3 acids) on lipolytic events in *in vitro* differentiated subcutaneous and visceral ADSCs from rabbits by evaluation of mRNA expression of the some lipolysis related factors. In general, the achieved data reveal, that comparing to the controls, both n-3 LC-PUFAs upregulated mRNA expression of GLUT4 (facilitated glucose transporter member 4), adiponectin, LPL (lipoprotein lipase) and CIDEA (cell death-inducing DNA fragmentation factor alpha-like effector A) in subcutaneous ADSCs. DHA and EPA have controversial effect on adiponectin and LPL mRNA expression in visceral rabbit ADSCs. In DHA treated visceral cells were observed increased adiponectin and suppressed LPL mRNA expression. Additionally in this treatment, the LPL was even downregulated compared to the controls. In conclusion, the obtained data in our study indicated that DHA could improve the lipolytic potential of visceral ADSCs rather than EPA. With respect to obesity and related disorders, this effect could be used for therapeutic treatment of MS and consequent obesity prevention.

Key words: DHA, EPA, lipolysis, rabbit ADSCs