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OLEATE UPREGULATES LECTIN GALACTOSIDE-BINDING SOLUBLE 2 (LGALS2) IN IN VITRO MODEL OF CELLULAR STEATOSIS

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Introduction Galectin-2 (LGALS2) has been shown to co-localise with and bind to lymphotoxin-α (LTA); a cytokine that have been associated with insulin resistance. Thus, LGALS2 has been implicated in metabolic syndrome traits. The association between a common polymorphism of LGALS2 with myocardial infarction has further supported this notion. However, a recent study also demonstrates a contrasting finding of lower fasting insulin and glucose levels with LGALS2. The association between LGALS and the hepatic manifestation of insulin resistance, non-alcoholic fatty liver disease (NAFLD), has not been examined. Here, the authors investigated in vitro whether hepatic steatosis influenced the expression of LGALS2.
Methods Human hepatoblastoma HepG2/C3A cells were pretreated for 3 days with oleate (0.25 mM) or octanoate (2 mM) to induce triglyceride accumulation. The authors have previously demonstrated that the addition of gluconeogenic substrates; lactate (L), pyruvate (P) and ammonia (N) to octanoate resulted in increased cellular steatosis that manifests many of the key features associated with steatohepatitis such as impaired mitochondrial structure/function, enhanced oxidative stress, decreased PTEN expression and altered cell cycle. LGALS2 mRNA expression was measured using quantitative real time PCR. Insulin resistance was determined by measuring concentration of glucose after a 4 h incubation of rinsed pretreated cells in the presence of insulin (0–10 nM).
Results As previously demonstrated, all pretreatment induced significant intracellular triglyceride accumulation. The authors found that oleate upregulated LGALS2 expression. In contrast, the expression of LGALS2 was unchanged with LPON. Despite a higher triglyceride accumulation with octanoate, LGALS2 mRNA expression was also unaltered (oleate 1.24±0.06, octanoate 1.19±0.04, LPON 1.09±0.06, untreated 0.95±0.02 fold change from β-actin, p=0.0006). Glucose concentration in oleate showed a stepwise reduction with increasing insulin concentration (insulin 0 nM: 1.23±0.21 μg/gTP/h; 10 nM: 0.92±0.15 μg/gTP/h, where TP, total protein) contrasting to the unchanged glucose with LPON (Insulin 0 nM: 1.94±0.28 μg/gTP/h; 10 nM: 2.05±0.25 μg/gTP/h).
Conclusion This data demonstrate that different FFA induces different LGALS2 expression. The presence of cellular steatosis per se or triglyceride concentration does not influence LGALS2 expression. Similar to the recent study, the upregulation of LGALS2 with oleate is associated with lower glucose concentration with preserved insulin sensitivity.
Competing interests None.
Keywords cellular steatosis, non-alcoholic fatty liver disease.