Silibinin improves hepatic and myocardial injury in mice with nonalcoholic steatohepatitis

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BACKGROUND: Nonalcoholic fatty liver disease is a chronic metabolic disorder with significant impact on cardiovascular and liver mortality.

AIMS: In this study, we examined the effects of silibinin on liver and myocardium injury in an experimental model of nonalcoholic fatty liver disease.

METHODS: A four-week daily dose of silibinin (20 mg/kg i.p.) was administrated to db/db mice fed a methionine-choline deficient diet. Hepatic and myocardial histology, oxidative stress and inflammatory cytokines were evaluated.

RESULTS: Silibinin administration decreased HOMA-IR, serum ALT and markedly improved hepatic and myocardial damage. Silibinin reduced isoprostanes, 8-deoxyguanosine and nitrites/nitrates in the liver and in the heart of db/db fed the methionine-choline deficient diet, whereas glutathione levels were restored to lean mice levels in both tissues. Consistently, liver mitochondrial respiratory chain activity was significantly impaired in untreated mice and was completely restored in silibinin-treated animals. TNF-α was increased whereas IL-6 was decreased both in the liver and heart of db/db fed methionine-choline deficient diet. Silibinin reversed heart TNF-α and IL-6 expression to control mice levels. Indeed, liver JNK phosphorylation was reduced to control levels in treated animals.

CONCLUSIONS: This study demonstrates a combined effectiveness of silibinin on improving liver and myocardial injury in experimental nonalcoholic fatty liver disease.