other cellular processes, including senescence while contributing to the pathogenesis of NAFLD.

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Moringa oleifera decreases biomarkers of oxidative stress in a murine NASH model

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Introduction and Objectives: This study aimed to evaluate the effect of Moringa oleifera aqueous extract on biomarkers of oxidative stress in a murine model of NASH.

Material and Methods: The characterization of the extract was performed by DPPH and ABTS spectrophotometric assays. Male C57BL/6J mice were randomly separated into two groups. 1) Standard diet (ND) (n = 5) (18% lipid) and 2) High fat (HF) diet (n = 10) (60% lipid and 42 g/L sugar in water of use), for 16 weeks. At the end of eight weeks, five HF group mice were divided into a subgroup, 3) Moringa Oleifera (HF + MO), 290 mg/kg/day p.o. for eight weeks. Malondialdehyde (MDA) levels were determined in liver homogenates and the transcriptome by microarray. Differences between groups were determined by ANOVA/Kruskal-Wallis test. The trial was approved by the research ethics committee.

Results: Moringa aqueous extract showed antioxidant capacity; DPPH values were 10081.4 0.3 and 22960.4 0.3 for ABTS. Hepatic MDA levels were increased in the HF group compared to the ND group ($p<0.05$) and decreased in the moringa-treated group ($p<0.05$). In the transcriptome, mRNAs involved in endoplasmic reticulum stress were underexpressed.

Discussion: An increase in MDA has been demonstrated in a murine model of NAFLD induced by a high-fat diet. In our study, Moringa administration reduces MDA production and gene expression of molecules involved in oxidative stress.

Conclusions: MO treatment is a therapeutic alternative for the NASH spectrum of liver disorders.

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Pirfenidone ameliorates MAFLD by improving insulin sensitivity and reducing epididymal fat

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Introduction and Objectives: Metabolic associated fatty liver disease (MAFLD) is characterized by hepatic steatosis with the following three metabolic conditions: obesity/overweight, diabetes and metabolic dysregulation, either alone or in combination. Pirfenidone (PFD) has anti-inflammatory, antioxidant, and anti-fibrotic effects. The aim of this study was to investigate the effects of PFD in mice with MAFLD induced by high-fat/high-carbohydrate (HFHC) diet.

Materials and methods: At the age of 6-7 weeks, six male C57BL/6 J mice were fed with a normal diet (ND, 18% kcal from fat food) and twelve with HFHC (60% kcal from fat food and drinking water with 42 g/L of carbohydrates: 55% fructose and 45% sucrose) diet for 20 weeks; at 10 weeks of feeding, six mice with HFHC diet were administered PFD (300 mg/kg/day) by gavage. An insulin tolerance test was performed, and data analysis were performed using SPSS. The trial was approved by the research ethics committee.

Results: All HFHC mice showed an increase in body weight and visceral fat accumulation ($P<0.01$), including elevated fasting glucose at week 20 ($P<0.001$). Liver weight and liver/body weight ratio exhibited no statistical significance. HFHC mice intervened with PFD showed reduced body weight gain ($P=0.054$) and epididymal fat pad weight ($P<0.05$). PFD also improved insulin resistance.

Discussion: Obesity, systemic insulin resistance, and diabetes are commonly associated with MAFLD, which may progress to nonalcoholic steatohepatitis (NASH). PFD has been shown to have benefits in models of lipotoxicity and NASH.

Conclusions: PFD could be a promising drug for the prevention and treatment of MAFLD induced by obesity.

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Hepatoprotective effect of caffeine against ischemia-reperfusion damage

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Introduction and Objective: This study aimed to determine the hepatoprotective effect of caffeine against Ischemia-Reperfusion (IR) damage in Wistar rats.

Material and methods: Eighteen female Wistar rats were divided into three groups (Sham, IR, Caffeine+IR, n=6). Hepatic ischemia was induced at 70% with 1 and 2 hours of reperfusion. The vehicle (saline solution) or 20 mg/kg of caffeine was administered before the induction of IR. The hepatoprotective effect was evaluated with biochemical markers, relative expression of genes associated with oxidative stress and inflammation, proinflammatory cytokines, and histology. The trial was approved by the research ethics committee.

Results: Caffeine significantly reduced levels of ALT, AST and direct bilirubin vs. IR group. Regarding the relative expression of genes, a significant decrease in the expression of the GPX, NF-$\kappa\beta$ and IL-1β genes was observed in the group treated with caffeine, while there was a decrease in the concentrations of IL-Iß, IL -6 and TNF-α;