Intermittent Fasting Promotes Redox Changes in Liver

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Introduction: Intermittent fasting (IF) consists of alternating eating cycles with fasting; studies using this protocol began as an alternative to typical caloric restriction. Both of the interventions result in enhanced short-term insulin sensibility and improvement in other aging hallmarks. However, the redox changes promoted by IF are still poorly understood. Therefore, the purpose of this study was to verify the redox effects of short-term IF. **Material and Methods**: 8 week old Sprague-Dawley rats were divided into two groups, one fed *ad libitum* and the other submitted to 24 h cycles of IF for 4 weeks. O_2 consumption, H_2O_2 release and activity of citrate synthase, catalase and glutathione peroxidase were evaluated in isolated mitochondria and liver homogenates. **Results and Discussion**: Liver mitochondria from fasted IF animals consume more oxygen using substrates for different complexes, which indicates a higher activity of mitochondrial respiratory chain complexes. There was no difference in the citrate synthase activity between groups, indicating that the respiratory effect is not associated to globally enhanced mitochondrial biogenesis. H_2O_2 release is equal in both groups, using substrates for complexes I and II. We found that IF animals have a lower glutathione peroxidase activity, both in fed and fasted animals. Catalase activity decreased significantly with a single fasting episode in *ad libitum* animals, but did not change in IF animals. **Conclusions:** Although H_2O_2 release is not different between groups, the differences in the oxygen consumption and in the activity of the antioxidant enzymes catalase and glutathione peroxidase demonstrate modifications in the redox balance in IF animal livers. Mechanisms underlying these changes need to be investigated.

Word Keys: intermittent fasting, mitochondria, redox state, liver, antioxidant enzymes

Supported by: FAPESP, CNPq, CAPES, INCT Redoxoma