# Bezafibrate Prevents Mitochondrial Dysfunction And Redox Homeostasis Impairment Induced By Sulfite Administration In Rat Striatum

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**INTRODUCTION:** Sulfite accumulates in tissues and biological fluids of patients affected by sulfite oxidase (SO) deficiency, a metabolic disorder that can arise either from a defect in the apoenzyme of SO or from the lack of its molybdenum cofactor. Symptomatology of SO deficiency includes neonatal seizures and neurological dysfunction that often lead to early death. Despite the severity of the neurological symptoms, there is no effective treatment for all the phenotypes of the disorder. **OBJECTIVES:** We investigated the effects of sulfite on mitochondrial function and redox homeostasis in striatum of rats and the potential beneficial effects of bezafibrate, a PPAR pan-agonist, on the possible effects induced by sulfite. **MATERIAL AND METHODS:** Thirty-day-old rats were intrastriatally injected with sulfite (2 µmol) or NaCl (2 µmol) and euthanized after 30 minutes. The pretreatment with bezafibrate (30 mg/kg/day) was performed during 7 days by gavage. Rat striata were homogenized and used for the evaluation of creatine kinase (CK), citrate synthase (CS) and antioxidant enzymes activities, reduced glutathione (GSH) concentrations, mitochondrial mass and membrane potential, and PGC-1α immunocontent. GFAP and S100β immunostaining was also analyzed in striatum slices. **RESULTS AND DISCUSSION:** Our results show that sulfite decreased CK and CS activities and mitochondrial mass and that bezafibrate prevented these effects. Sulfite also decreased GSH concentrations and the activities of glutathione peroxidase (GPx), glutathione reductase, glutathione S-transferase (GST) and glucose-6-phosphate dehydrogenase, whereas catalase activity was increased. Moreover, bezafibrate attenuated the sulfite-induced inhibition of GPx and GST activities. Regarding PGC-1α, sulfite decreased its immunocontent and bezafibrate prevented this reduction. Finally, sulfite enhanced GFAP and S100β immunostaining, indicating astrogliosis. **CONCLUSIONS:** It can be presumed that these alterations caused by sulfite may contribute to the neurological symptoms observed in SO deficiency and that bezafibrate could be considered as an adjuvant therapy to improve the prognosis of this disorder.

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