Protective effect of non-selective and selective COX-2-inhibitors in acute immobilization stress-induced behavioral and biochemical alterations

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Abstract:
Acute stress has been known to produce several behavioral, neurochemical and biochemical alterations. Cyclooxygenase (COX) enzymes are involved in pathogenesis of several brain disorders including Alzheimer disease, epilepsy, depression, in addition to pain and inflammation. In the present study, we examined the role of non-selective (naproxen) and selective (rofecoxib, valdecoxib) COX-2 inhibitors against acute immobilization stress-induced behavioral alterations and oxidative damage in mice. Mice were subjected to acute immobilization stress for a period of 6 h. Naproxen (7 and 14 mg/kg, ip), rofecoxib (5 and 10 mg/kg, ip) or valdecoxib (5 and 10 mg/kg, ip) were administered 30 min before acute stress. Six-hour immobilization stress significantly caused anxiety-like behavior, memory deficit and impaired motor activity as well as oxidative damage (raised lipid peroxidation, nitrite activity, depletion of reduced glutathione and catalase activity) as compared to naïve animals placed on sawdust (p < 0.05). Pretreatment with naproxen (7 and 14 mg/kg, ip), rofecoxib (5 and 10 mg/kg, ip) and valdecoxib (5 and 10 mg/kg, ip) significantly improved locomotor activity, anti-anxiety effect, memory retention (memory deficit) and attenuated oxidative damage (lowering of raised malondialdehyde, nitrite activity, restoration of reduced glutathione and catalase activity) as compared to immobilization stress group (p < 0.05). Results suggest the neuroprotective and antioxidant effect of both non-selective and selective COX-2 inhibitors.

Key words: cyclooxygenase, immobilization stress, naproxen, rofecoxib, valdecoxib