Plasma malondialdehyde levels and opiate withdrawal signs observed in rats treated with morphine plus naloxone: effects of alpha-lipoic acid administration.

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BACKGROUND: A number of experimental studies have found that reactive oxygen species are involved during morphine treatment or withdrawal.

OBJECTIVE: The aims of this study were to analyse whether morphine administration and/or removal are related to peroxide generation and/or signs of withdrawal in rats, and whether the changes in antioxidant status induced by the administration of an antioxidant may modify peroxide levels and behavioural signs.

METHODS: We injected morphine or morphine and naloxone into rats and evaluated the plasma levels of peroxide malondialdehyde (MDA) and the appearance of withdrawal signs. We also investigated the effects on these parameters induced by the administration of the antioxidant alpha-lipoic acid (LA).

RESULTS: Morphine treatment increased MDA levels. Abrupt naloxone-induced morphine withdrawal caused a further and significant increase in MDA, and the appearance of withdrawal signs such as abnormal fecal excretion, shortened latency times and jumping. The administration of LA lowered MDA levels in the rats treated with morphine or morphine plus naloxone, and also decreased MDA values and abstinence signs in the animals treated with morphine plus naloxone.

CONCLUSIONS: The effects of LA were attributed to its capacity to scavenge peroxides and interfere with the biogenesis of the arachidonic acid metabolites involved in the expression of abstinence symptoms.

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