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Khat, a natural amphetamine, worsens cognitive and behavioural outcomes following repetitive mild traumatic brain injury

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Mild repetitive brain injury (mild TBI) frequently occurs in contact sports. It has received more attention in recent years following suggestions that it may lead to neurodegenerative, neurocognitive and neuropsychiatric consequences. The course of these neurological effects may be influenced by the use of psycho stimulants during training and competition. The plant (Catha edulis Forsk) khat, synthesizes cathinone, an amphetamine like psycho stimulant. Khat is consumed widely in Eastern Africa and parts of the Arabian Peninsula and likely used in sports of these regions. We investigated if khat would alter the neurological outcomes in a mouse model of repetitive mild traumatic brain injury (RmTBI). Adult male Swiss albino mice were randomly assigned into four groups: control (CON); khat treated (K); repetitive mild TBI without khat treatment (rmTBI) and; repetitive mild TBI with khat treatment (rmTBI+K). RmTBI was simulated using a modified protocol of the Wayne State USA weight drop model, where the mice received a single mild head injury daily for five days. Freeze dried extracts of fresh khat was administered by an I.P. injection every day for five days, 15 minutes before injury induction. In the rmTBI+K, there was significant increase in righting reflex time, working memory deficits at day 15 in a spontaneous-alternation task in a T-maze, reduced grooming time on day 30 in the depression splash test and longer time to complete the difficult tasks in the puzzle box on day 60. Compared to CON, the rmTBI group performed poorly in the same tests, but the difference was not statistically significant. The performance of the K and CON groups were similar. The results show that rmTBI resulted in deficits in behaviour and cognitive function on a long-term basis and these deficits are worsened by khat.

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