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Comparative effects of *Catha edulis* and methyl phenidate on spatial working memory and reference memory in rats

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The effects of *Catha edulis*, as a CNS stimulant have been studied on various aspects, but how *C. edulis* influences spatial learning and memory is not clear. We hypothesize C. edulis, as it contains amphetamine like substances; will also influence spatial learning and memory. With this aim, a comparative study is conceded using another CNS stimulant, methylphenidate (MPD), an advanced therapeutic for treatment of attention deficit hyperactive disorder (ADHD). Spatial learning and memory was assessed using radial arm maze, by analysing five dependent measures obtained in every trial: Time to complete a trial, latency to first arm entry, number of reference memory errors, and number of working memory correct and incorrect errors. Taken together, our results showed that C. edulis, and not MPD fed rats, had impaired learning and memory, implicated by increased time to complete a trial. Either *C. edulis* or MPD increased attention in rats, as in both groups, latency to first arm entry was less. Moreover, *C. edulis* fed rats were more effected in the working memory component and reference memory was intact, highlighting the significance of restricting the widespread use of *C. edulis* in humans. Multiple evidences and our findings strongly support the use of MPD as a choice of drug in treatment of ADHD with minimum deterioration on learning and memory, in spite of increasing attention and alertness. However, considering differential action of *C. edulis* and MPD on neurotransmitter systems of brain, more studies are requested for the effect of *C. edulis* on neurotransmitters in hippocampal network.

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The chorda tendinae and papillary muscle junction in human heart: A morphological study

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The mitral valve apparatus is a complex three-dimensional functional unit that is critical to unidirectional heart pump function. Understanding the morphology of the normal mitral valve apparatus is essential to comprehend various alterations observed in mitral valve diseases. We aimed to investigate the morphology of the chordae tendineae and the papillary muscle junction in the human mitral valve. This study includes the mitral valve apparatus from eight normal human hearts, which were obtained from the Pathology Department of University Hospital Galway, Ireland. We employed light, transmission and scanning electron microscopy techniques to study the mitral valve apparatus. This study showed that the chordae tendineae and papillary muscles exhibit considerable variation in their number, appearance and pattern of arrangement. False or 'atypical chordae' were also observed. Results showed that the chordae tendinae are primarily fibrocollagenous structures, with predominantly elastic fibers in the periphery and collagen fibres forming the main core. Longitudinal as well as circumferential pattern of arrangement for collagen and elastic fibers was observed. The chordae tendineae and papillary muscle junction area was found to be adequately vascularized. Blood vessels appear to spiral along the longitudinal axis of the chordae. Few degenerating axons were identified in the periphery of the chordae. Typical arrangement of collagen fibers within chordae may prevent the imposition of excessive strains on the individual collagen fibrils. It will be interesting to investigate the role of atypical chordae in mitral valve diseases. This study extends our understanding of the structural aspects of the normal mitral valve apparatus.

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