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Effect of turmeric in scopolamine-induced cognitive impairment in mouse model

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Background: Memory and learning impairment in neurodegenerative disorders has been attributed to underlying perturbation in cholinergic system. Turmeric, a potent anti-inflammatory compound, like donepezil, has shown to have sound effect on cholinergic system improving memory and learning.

Aim: In the current study, we intended to elucidate the effect of turmeric alone and in synergism with donepezil on scopolamine induced amnesia mouse model.

Methods: BALB/c mice were administrated scopolamine (1 mg/Kg/day) through sub cutaneous injections for a period of 26 days. On 11 day, Donepezil (4 mg/Kg/day) and Turmeric (20 mg/Kg/day) was given mixed in feed. Novel recognition test, fear contextual and fear conditioning test, a memory tests were performed to evaluate memory consolidation and acquisition. RT-PCR was used to measure the mRNA expression of M1, M3, and M5 receptors of cortex and amygdala.

Results: Turmeric significantly ($p<0.01$) improved the expression of cholinergic muscarinic receptors M1 (0.67 ± 0.06), M3 (1.23 ± 0.30) and M5 (2.66 ± 0.52) in turmeric treated group as compared to scopolamine-induced amnesia group (0.34 ± 0.07 , 0.49 ± 0.03 and 1.53 ± 0.14) respectively in cortex. The impairment in cortex dependent learning and memory was inverted in scopolamine-induced amnesia group as evident from improvement in fear conditioning ($p<0.001$), contextual ($p<0.001$) and fear extinction ($p<0.001$) in turmeric treated group as compared to scopolamine-induced amnesia group. Recognition memory was also improved ($p<0.001$) following turmeric administration as compared to scopolamine-induced amnesia, once again showing turmeric's positive effect.

Conclusion: Therefore in the light of these findings turmeric may serve as a potential candidate in improving cognitive functions. It can also act as a therapeutic option for neurodegenerative disorders.

Biography

Maryam Masood is currently working as a Professor at Atta-ur-Rahman School in Department of Applied Biosciences, National University of Sciences and Technology in Pakistan.

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