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The aid of ephedrine HCL, curcumin and turmerone in neurogenesis and inhibition of beta-amyloid plaques in transgenic mice models

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Purpose & Background: This study was done to demonstrate the effects of Ephedrine HCL, turmerone & curcumin in neurogenesis and inhibition of beta amyloids in transgenic mice. The transgenic mice models used contain mutations associated with familial Alzheimer's disease (APP Swedish, MAPT P301L and PSEN1 M146V). These mice develop age-related, progressive neuropathology including plaques and tangles.

Methods: Ten-month-old male and female APPSw Tg+ and Tg− mice from 12 litters were randomly split between treatment groups. Tg+ mice were fed either chow containing a low dose of curcumin (160 ppm; n=9; a high dose of curcumin (5000 ppm; n=6), or no drug (n=8) for 6 months. Mice with low and high dose of curcumin were given specific doses of 0.02% Ephedrine HCL injection every 72 hours and underwent a single intracerebroventricular injection of 3 mg ar-turmerone. To evaluate whether curcumin treatment affected plaque pathology, cryostat hemibrain sections from Tg+ control and Tg+ low-dose curcumin-treated mice were immunostained with an antibody against Aβ1–13(DAE).

Results: Two-factor ANOVA revealed a significant reduction in plaque burden in curcumin, Ephedrine HCL and turmerone treated animals (F $(1,60)$=4.74; p=0.03), in which amyloid burden was decreased by 43.6% in treated animals compared with untreated animals. Soluble Aβ in Tg+ untreated and Tg+ low-dose curcumin mice were measured by sandwich ELISA. Two-way ANOVA showed significant treatment effects in decreasing the levels of soluble Aβ (p<0.05).

Conclusion: Underlying mechanistic pathways that might link curcumin treatment to increased cognition and neurogenesis via exon array analysis of cortical and hippocampal mRNA transcription showed a positive result.

Biography

Keerthi Paramasivam has completed her MBBS degree at Dr. NTR University of Health Sciences, Andhra Pradesh and went on to Graduate with Master's in Clinical Neuroscience from King's College, London. She is currently a second year PhD student in Neuroscience at Harvard Medical School. She is a fully registered Medical Practitioner recognized by the General Medical Council, The Medical Council of India and the Malaysian Medical Council. She currently works at the National Neuroscience Institute of Singapore and has assisted and worked in several clinical research and trials. She has conducted several neuroscience seminars and workshops in Malaysia and is a Member of the Malaysian Society of Neurosciences.

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