PP-12: Effects of long-term meditation practice on expression of *CRY1 and CRY2* genes related to circadian rhythm:a case-control study

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Introduction: Many physical, metabolic and behavioural changes in the human body follow a circadian rhythm. Cryptochrome circadian regulator (*CRY*) 1 and 2 genes encode circadian proteins important for circadian rhythmicity. Up-regulated *CRY* genes ensure the stability of the circadian rhythm which contribute to maintenance of homeostasis in the body. Practice of meditation has been suggested to up-regulate the expression of *CRY1* and *CRY2* genes. This case-control study compared expression of *CRY1* and *CRY2* genes between long-term, skilled meditators and non-meditators.

Methods: Thirty meditators were recruited from meditation centres in different parts of Sri Lanka following a two-tier screening process and age and gender matched non-meditators were recruited from the community. Socio-demographic characteristics including exercise hours per week were collected. Expression of *CRY1* and *CRY2* genes was assessed via reverse transcriptase polymerase chain reaction. Relative gene expression was determined using the $2^{-\Delta\Delta CT}$ method. Independent sample t-test was used to compare the mean fold changes of the expression of genes between meditators and controls. Pearson correlation was used to determine the bivariate relationships between continuous variables.

Results: Nineteen of the 30 participants (63.34%) in each group were male and the average age (SD) of participants was 43.83 (9.92) years. Mean duration of the meditation practice of the meditators was 6.80 (3.27) years and they had meditated for a mean period of 5.82 (3.45) hours per day. A significant increase in the expression of *CRY1* (FC=9; p=0.037) and *CRY2* (FC=6.6; p=0.05) were found in meditators compared to controls which indicate that the meditators had stabilised circadian rhythmicity. Expression of *CRY1* gene increased significantly with the duration of meditation practice (r=0.377; p=0.040). The expression of *CRY2* gene significantly increased with the duration of exercise hours (r=0.256; p=0.046).

Conclusions: Up-regulated *CRY* genes in meditators result in stabilised circadian rhythmicity which contribute to maintenance of body homeostasis.

Keywords: meditation, gene expression, *CRY1*, *CRY2*, long-term meditators, case-control

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