

Effects of TNF- α G308A Polymorphism on Sleep in Healthy Young Women with and without Primary Dysmenorrhea

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Objective: Primary dysmenorrhea (PDM) is often associated with sleep disturbances and has been revealed a higher tumor necrosis factor-alpha (TNF- α) gene expression in the peripheral blood monocytes across the menstrual cycle in patients than in the unaffected control. This study was set out to examine the effect of TNF- α G308A polymorphism (rs1800629) on self-reported sleep and health as well as peri-ovulatory serum TNF- α level in women with and without PDM.

Methods: Self-reported sleep and health questionnaire and a menstrual cycle of sleep and menstrual diary were collected from a cohort of 43 PDM women and 42 healthy controls (aged 20-30 years, right-handed, non-smoking and non-shift workers without psychiatric, sleep and neurological comorbidity). Chi-square tests were used to check if the genotype proportions of the investigated gene fitted the Hardy-Weinberg equilibrium (HWE) and to evaluate if the genotypic and allelic distribution is associated with PDM. Chi-square tests or analysis of variance were used to examine the effects of genotype, group and/or genotype x group interaction with the sleep and health variables.

Results: Neither allele frequencies nor genotypes of TNF- α G-308A gene could serve as an independent risk factor of PDM in the Taiwanese population. Circulating serum TNF- α did not correspond with the -308 TNF- α promoter polymorphism, either, which might be due to a multifactorial control process. The TNF- α 308 A allele carriers (28.6%) which was less common than the G allele carriers (71.4%), showed lower Beck depression score, lower bodily pain and better physical health and higher subjective sleep quality. Furthermore, in G allele carriers, the PDM group showed higher insomnia severity and lower sleep duration than that of the control group.

Conclusion: Present results indicated that TNF-alpha polymorphism conferred no prediction to PDM risk and peri-ovulatory serum TNF- α level. However, our findings provided evidence that the A allele at the TNF α 308 locus, as compared to the more common G allele, was associated to better health and better sleep, which might offer a genetic underpinning to their better resistance from the risk of PDM.

中文題目：TNF- α G308A 多態性對有或無原發性痛經健康年輕女性睡眠的影響
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