SKA2 gene - A novel biomarker for latent anxiety and preterm birth prediction

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Abstract

Background: There is a relationship between preterm birth (PTB) and anxiety. Spindle and Kinetochore Associated Complex Subunit 2 (SKA2) gene polymorphism (NC_000017.11: g.59110368 G > A) has also been associated with the development of anxiety. The current study was designed to evaluate the relationship between SKA2 gene SNP (NC_000017.11: g.59110368 G > A) with the occurrence of anxiety and PTB which might be considered a predictive biomarker for the prediction of preterm delivery.

Methods: SKA2 gene (SNP rs7208505) genotyping was performed in 300 women with term birth (TB) and 293 women with PTB using PCR-RFLP method and then followed by DNA sequencing. Cortisol level was analyzed with ELISA method and the presence of anxiety was detected using Spielberg Inventory.

Results: The AA genotype of SKA2 gene significantly increased the risk of PTB compared to the GG genotype by 9.6 fold ([CI] 4.5-20.2, $P < 0.001$) according to codominant model. Also, the frequency of A allele was significantly higher in PTB group ($\chi^2 = 20.4$, df = 1, $P < 0.001$) in comparison with the control group that increased the risk of PTB by 1.703 fold ([CI] 1.39-2.23, $P < 0.001$). Women with higher cortisol level with average $343.7 \pm 3$ nmol/L had AA genotype, while, the concentrations of cortisol in women with AG, and GG genotypes were $244.2 \pm 3.1$ nmol/L and $192.6 \pm 2.5$ nmol/L, respectively ($P < 0.001$). The score of apparent and latent anxiety in women with the AA genotype was higher compared to the AG and GG genotypes and also this score in women with the AG genotype was higher than the GG genotypes ($P < 0.001$). The history of preterm delivery was higher in women with the AA genotype (42.1%) in comparison with the GG (14.9%) and AG (22%) genotypes ($P < 0.05$).

Conclusion: The results of the current study suggest that prognosis of women with the AA genotype are more susceptible to be spontaneous preterm birth. Therefore, the A allele of SKA2 gene (NC_000017.11: g.59110368 G > A) could be as a predictive biomarker for the risk of PTB.

Keywords: Anxiety; Cortisol; Polymorphism; Preterm birth; SKA2 gene.