

Maternal Chronotype and Pregnancy Outcomes in Gestational Diabetes

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Introduction: Gestational diabetes mellitus (GDM) is an increasingly frequent complication of pregnancy and its presence is related to the development of adverse maternal and fetal outcomes. Pregnancy is deeply influenced by the circadian rhythm and the misalignment of the maternal rhythm can lead to disturbances in the temporal organization of physiological and metabolic functions. Previously, the association between circadian rhythm disorders and diabetes has been well described in pregnancy.

Objective: To investigate the influence of chronotype on the development of maternal and fetal complications during pregnancy in GDM.

Methodology: Prospective cohort study of patients with GDM. Clinical data and behavior questionnaires were collected by face-to-face interview. Questionnaires evaluated the chronotype (Morning-Eveningness-Questionnaire- MEQ), sleep quality (Pittsburgh Sleep Quality Index- PSQI), daytime sleepiness (Epworth Sleepiness Scale -ESS), depressive symptoms (Edinburgh Postnatal Depression Scale-EDPS) and insomnia (Insomnia Severity Index- ISI). Sleep diaries (14 days) and actigraphic record (5 to 7 days) were obtained.

Results: Overall, 305 2nd to 3rd trimester GDM patients were evaluated. Eighty-nine GDM patients completed the sleep diary and 53 performed a valid actigraphic registry. Amongst these, 49.5% were identified as morning chronotypes (MEQ \geq 59), 43.6% intermediate types (MEQ from 42 to 58) and 6.9% had evening type preference (MEQ $<$ 41). Evening preference patients were younger ($p < 0.005$), had more unstable marital status ($P = 0.04$), had worse sleep quality ($p = 0.02$); latter sleep midpoint ($p = 0.01$), higher prevalence of insomnia ($p < 0.005$) and depression ($p = 0.004$) before and during pregnancy. No differences were found in total sleep duration as recorded by sleep diary ($p = 0.4$) or actigraphic measurements ($p = 0.83$). Evening type preference in GDM was associated with pre-eclampsia ($p = 0.02$) and neonatal ICU admission ($p = 0.03$).

Conclusion: This study suggests that the presence of the evening-type chronotype in pregnant women with GDM is associated with adverse pregnancy outcomes such as the development of hypertensive syndromes, insomnia and depressive symptoms. In addition, a higher prevalence of newborns admitted to the neonatal ICU was found in the offspring of GDM patients with evening preference.