The influence of circadian rhythm disorders on metabolic factors

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Introduction: Shift work is associated with cardiovascular risks and metabolic diseases.[1] The natural circadian rhythm plays a role in maintaining normal metabolic and hormonal status.[2,3] The aim of this cross-sectional study was to determine the relationship between circadian rhythm disorders, blood pressure, metabolic and hormonal parameters in women.

Methods: The respondents were nurses divided into two groups: 12-hour shift work (day/night) and regular 8-hour work (day). The questionnaire included primary health status, medical history, premenopausal or postmenopausal status, habits, chronic therapies, duration of shift work or regular work in years. Blood pressure was measured three times during the examination. Anthropometric measures were obtained, and body mass index (BMI) was calculated. Postmenopause was defined by absence of menstruation for 12 or more months. Fasting blood samples included a hematological, biochemical, and hormonal panel. The level of statistical significance was set at $p < 0.05$.

Results: Of all respondents, 43 (64%) worked shift work, 45 (67.2%) had a BMI ≥25, antihypertensive therapy was taken by 19 (37.3%), diabetes therapy by 3 (4.5%), and 42 (62.7%) subjects were postmenopausal. We found a significant and positive correlation between ferritin and high-sensitivity C-reactive protein (hsCRP) in shift working nurses (Rho = 0.468; P = 0.002). A positive correlation was found between the duration of shift work and systolic blood pressure (Rho = 0.424, P = 0.03). Subjects working in shifts had significantly lower triglyceride levels (Mann Whitney U test, P = 0.03) and higher testosterone levels (Mann Whitney U test, P < 0.001). Prediabetic nurses had significantly higher LDL-C and fasting blood sugar levels.

Conclusion: In this study, we found a significant and persistent link between shift work and systolic blood pressure. There is a significantly positive correlation between hsCRP and ferritin in all subjects, especially in subjects working in shifts. Further studies are needed to determine the relationship between shift work and cardio-metabolic diseases and thus the necessary preventive measures.

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LITERATURE

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