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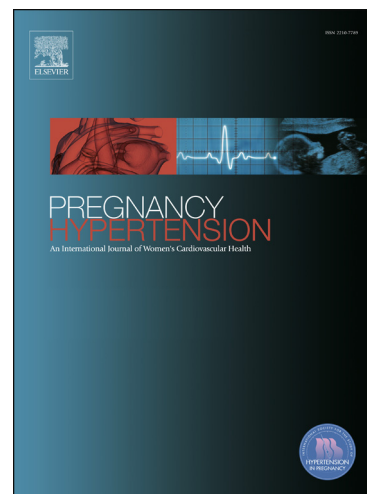
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The Chronobiology of Blood Pressure in Pregnancy

Suzanne Pears^{1,2,4}, Angela Makris^{3,4,5}, Annemarie Hennessy^{3,4,6}

¹Royal Prince Alfred Hospital

²University of Sydney

³Western Sydney University

⁴Heart Research Institute

⁵Liverpool Hospital

⁶Campbelltown Hospital

ABSTRACT

This review summarizes the literature to date on the subject of the chronobiology of blood pressure in pregnancy, and more specifically, in the common disease state of high blood pressure in pregnancy or preeclampsia. While the guidelines for treating hypertension in pregnancy use absolute measures to start treatment, they do not take into account the important rhythms of hypertension including nighttime and daytime readings. These variations are likely to have strong impacts on pregnancy outcomes, risk and long-term hypertension risk.

Keywords: chronobiology, circadian, blood pressure, pregnancy, hypertensive disorders pregnancy, preeclampsia

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INTRODUCTION

Chronobiology is the study of biological rhythms that examine cyclic, or periodic, phenomena in living organisms and their adaptation to solar and lunar related rhythms¹. Chronobiological studies can include comparative anatomy, physiology, genetics, molecular biology, behaviour, development, reproduction and evolution.¹ Chronobiology is an interdisciplinary field of investigation and includes sleep medicine, endocrinology, psychiatry, sports medicine as well as space and travel medicine. Variations in the timing and length of biological activities is apparent with many essential biological processes including, but not limited to, eating, sleeping, mating, hibernating, migration and cellular regeneration.¹

The most central rhythm in chronobiology is the circadian rhythm: a roughly 24-hour cycle that is demonstrated by rhythmic physiological processes approximating a day.² It is regulated by circadian clocks¹ which are endogenous, and characterised by a molecular response, such as gene oscillations, to light. Apart from sleep and endocrine cycles in humans, most is known about blood pressure rhythms in humans. Recent work has implicated the circadian clock genes in the regulation of processes in the heart, kidney, vasculature, and the metabolic organs, which are all critical in the regulation of blood pressure.³ There is some evidence that suggests that disruption

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