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REVIEW ARTICLE

Antenatal and perinatal factors influencing neonatal blood pressure: a systematic review

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ABSTRACT A comprehensive understanding of the factors contributing to perinatal blood pressure is vital to ensure optimal neonatal health outcomes. The objective of this study was to review existing literature on maternal and perinatal factors influencing blood pressure in neonates up to 1 month corrected age. **RESULTS** A systematic search of published literature on blood pressure, blood volume and the (C)OVID-19 search identified publications relating to maternal factors affecting blood pressure of neonates up to corrected age of 1 month. Summary data were extracted and a meta-analysis (Cochrane Review) was performed. **CONCLUSIONS** There is insufficient evidence to draw definitive conclusions regarding the impact of various maternal and perinatal factors on neonatal blood pressure. Future investigations of maternal cardiovascular phenotypes should account for these factors in their study design. Similarly, studies on maternal disease and perinatal interventions should include neonatal blood pressure as part of their primary or secondary analyses. *Journal of Perinatology* (2021) 41:1111–1121. <https://doi.org/10.1038/s41375-021-01111-1>

INTRODUCTION

Small-for-gestational-week (SGW) among newborns reflects subtle variability in the neonatal perinatal period (1–3). However, neonatal BP values have been associated with challenges, gestational age at birth, and neonatal age (1, 3). This variability in BP values is challenging to trace whether neonatal BP values are too high (hypertension) or too low (hypotension), increasing the difficulty of interpreting the signal for a specific neonate. During COVID-19 pandemic, there is an additional need to address neonatal hypertension which is often underdiagnosed (1, 4, 5).

The onset of neonatal factors beyond antenatal and perinatal age on neonatal BP values is positive (1, 3, 6–12). These include maternal condition, perinatal clinical circumstances, and any additional age-related neonatal factors. A comprehensive understanding of these factors is vital to ensuring optimal perinatal outcomes and support for neonates in the neonatal perinatal period.

Understanding the cause of hypertension allows for better therapeutic choices for postnatal neonatal hypertension treatment.

For example, hypertension secondary to maternal pre-eclampsia or gestational diabetes mellitus (GDM) may require specific management (13) in relation to neonatal blood pressure and/or blood sugar. Similarly, neonatal hypertension may also be determined based on maternal factors, such as chronic kidney disease (CKD) or chronic hypertension (CHT). Neonatal hypertension may require early use of antihypertensive therapy (14).

The International Neonatal Consortium (INC) was formed in 2017 with the aim of engaging members of the global neonatal community to promote the advancement of safe and effective neonatal care (15). The INC is a global network of neonatal researchers, clinicians, and policy makers, who are collaborating to address existing evidence and practice gaps in neonatal care, support better clinical trial methodology, and improve neonatal outcomes.

This paper is the second in a series of articles being published by the International Neonatal Consortium (INC) in the *Journal of Perinatology* (JP) journal on best practice recommendations.

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