Interpregnancy Intervals in a Contemporary Manitoba Cohort: Prevalence of So-Called Suboptimal Intervals and Associated Maternal Characteristics

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Abstract

Objective: Short and long interpregnancy intervals (IPIs) have been associated with various adverse outcomes, and a 2016 American College of Obstetricians and Gynecologists' Committee Opinion recommends an optimal IPI of 18 months to 5 years. Descriptive data on the IPI in Canada are lacking. The objective of this study was to examine IPIs in a Manitoba cohort.

Methods: We analyzed a subset of records from a larger dataset used to examine the IPI and adverse perinatal outcomes. For that study, Manitoba's Hospital Abstracts data were searched to identify births from 1985 to 2014. Each two consecutive live births to the same mother formed a sibling pair. The IPI was calculated as the interval between the two siblings' births, minus the younger sibling's GA. Information on maternal characteristics was extracted from various datasets housed in the Manitoba Population Research Data Repository. The current analysis examined second and higher-order births between 2010 and 2014. The proportion of suboptimal IPIs was determined and IPIs were cross-tabulated with birth year and maternal subgroups.

Results: More than half of pregnancies were conceived following a suboptimal interval. IPIs of less than 6 months – which have been associated with the highest risk of adverse outcomes – were more prevalent among certain subgroups. These included younger women as well as women who received inadequate prenatal care, smoked or drank alcohol during pregnancy, were low income, or did not graduate from high school.

Conclusion: Suboptimal IPIs were common in this Manitoba cohort. Stakeholders should consider whether greater efforts to promote appropriate birth spacing are warranted.

Key Words: Birth spacing, pregnancy intervals, Manitoba

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Competing interests: The authors declare that they have no competing interests.

Received on September 18, 2017

Accepted on December 2, 2017

Résumé

Objectif : Les intervalles intergravidiques courts et longs ont été associés à diverses issues défavorables. Une opinion du Comité de l'American College of Obstetricians and Gynecologists de 2016 recommande un intervalle optimal de 18 mois à 5 ans. Il manque de données descriptives sur les intervalles intergravidiques au Canada. Cette étude visait à examiner ces intervalles dans une cohorte du Manitoba.

Méthodologie : Nous avons analysé un sous-groupe de dossiers dans un plus grand ensemble de données afin d'examiner l'intervalle intergravidique et les issues périnatales défavorables et cherché dans la base de données Hospital Abstracts du Manitoba pour relever les naissances survenues de 1985 à 2014. Deux naissances vivantes consécutives de la même mère formaient une paire fraternelle. L'intervalle intergravidique a été calculé comme étant l'intervalle entre les deux naissances, moins la durée de gestation du plus jeune enfant. Les renseignements sur les caractéristiques maternelles ont été extraits de divers ensembles de données hébergés dans le Manitoba Population Research Data Repository. L'analyse présentée ici examinait les naissances, survenues entre 2010 et 2014, de mères ayant déjà eu un enfant. Le pourcentage d'intervalles intergravidiques sous-optimaux a été établi et les intervalles intergravidiques ont été recoupés en fonction de l'année de naissance et des sous-groupes maternels.

Résultats : Plus de la moitié des grossesses ont débuté après un intervalle intergravidique sous-optimal. Les intervalles de moins de 6 mois, qui ont été associés au risque le plus élevé d'issues défavorables, étaient plus fréquents dans certains sous-groupes, notamment chez les jeunes femmes et les femmes qui avaient reçu des soins prénatals inadéquats, qui avaient fumé ou bu de l'alcool durant la grossesse, qui avaient un faible revenu ou qui n'avaient pas terminé leurs études secondaires.

Conclusion : Les intervalles intergravidiques sous-optimaux étaient courants dans cette cohorte manitobaine. Les intervenants devraient se demander si des efforts accrus en matière de sensibilisation au sujet de l'espacement approprié des naissances sont nécessaires.

J Obstet Gynaecol Can 2018;40(8):1024–1030
https://doi.org/10.1016/j.jogc.2017.12.001

INTRODUCTION

The interpregnancy interval (IPI) is the length of time between the end of one pregnancy and subsequent conception. Both short and long IPIs have been associated with a variety of adverse outcomes, including, but not limited to, preterm birth,[1–3] congenital anomalies,[4,5] and autism spectrum disorder.[6]

Although various biologic mechanisms have been proposed to explain the observed associations,[7] whether they are actually causal is still a matter of debate.[8] Nonetheless, the U.S. Department of Health and Human Services' Healthy People 2020 initiative is targeting a reduction in the proportion of pregnancies conceived within 18 months of a previous birth,[9] and a 2016 Committee Opinion from the American College of Obstetricians and Gynecologists recommends 18 months to 5 years as the optimal interval between delivery and subsequent conception.[10]

In contrast, we are not aware of any broad-based initiatives in Canada to monitor birth spacing or to promote an appropriate IPI on the basis of the current evidence. A search of the SOGC website (www.sogc.org) at the time of this writing using the terms "birth spacing," "birth interval," and "interpregnancy interval" yielded no results, and the Motherisk Program, which provides evidence-based counselling on pregnancy to families and health care providers across Canada, does not include the promotion of appropriate birth spacing in its summary of recommended preconception interventions for preventable risks.[11]

Similarly, although IPI patterns among American women have been comprehensively described,[12] we are not aware of any comparable reports for Canada. Such data could inform discussions on whether broader efforts to promote the appropriate spacing of pregnancies are warranted. Our objectives were to determine the proportion of live births conceived after so-called suboptimal intervals in a contemporary Manitoba birth cohort, and to examine whether those IPIs were more prevalent among certain subgroups of women.

METHODS

Data Source and Cohort

The data for this analysis comprised a subset of records from a larger dataset used to examine the IPI and adverse perinatal outcomes in Manitoba.[2] For that study, the Hospital Abstracts data housed in the Manitoba Population Research Data Repository were searched to identify in-hospital births between April 1, 1985 and March 31, 2014, inclusive. Maternal and newborn records were linked, and each two consecutive births to the same mother formed a sibling pair. Exclusion criteria included the following: stillbirth, multiple birth, GA of less than 22 weeks or greater than 43 completed weeks, or mother did not have continuous health coverage in Manitoba or had a pregnancy loss between the two births. For the work described in this paper, we examined second and higher-order births between 2010 and 2014, to provide a more current and hence policy- and planning-relevant characterization of IPI patterns in Manitoba.

Variables

The IPI was derived for the younger sibling of each sibling pair by calculating the interval between the birth dates of the two siblings and then subtracting the younger sibling's GA at birth. IPIs were categorized as <6, 6–11, 12–17, 18–23, 24–59, or ≥60 months. As per the American College of Obstetricians and Gynecologists' recommendations,[10] IPIs of less than 18 months and 60 months or longer were considered suboptimal.

Records from nine datasets housed in the Manitoba Population Research Data Repository were linked for the larger study to create variables that captured information on the gestation and birth of the younger siblings (a list of those datasets is provided elsewhere, as well as detailed information on how each variable was defined[2]). For the analysis described here, we included maternal age at delivery; parity; adequacy of prenatal care, as measured by the Revised-Graduated Prenatal Care Utilization Index (R-GINDEX)[13]; maternal smoking during pregnancy; maternal alcohol consumption during pregnancy; maternal chronic hypertension; pre-existing or gestational diabetes; whether the mother graduated from high school; and whether she had ever received income assistance. The Socio-economic Factor Index-Version 2 (SEFI-2) score was used as an area-level measure of socioeconomic status.[14]

Analysis

IPIs were cross-tabulated with maternal characteristics and 95% binomial confidence intervals were calculated for the distributions across maternal subgroups. Mean SEFI-2 scores were derived for each IPI category, and a one-way ANOVA was used to test for differences in means.

All references to significance are based on a P value of <0.05.