

Impact of the Overall Workload on Pregnancy



SUMMARY

November 2015

Synopsis of the publication: *Effets de la charge globale de travail sur la grossesse: synthèse systématique avec méta-analyse et méta-régression* [Impact of the Overall Workload on Pregnancy: Systematic Review with Meta-analysis and Meta-regression].¹

Summary

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The *For a Safe Maternity Experience* program, set out in Québec's *Act respecting occupational health and safety* entitles pregnant or breastfeeding workers to be assigned to other duties if their working conditions include risks related to pregnancy or nursing.

To foster the harmonization of the assessment of risks and the recommendations made under the program, the *Groupe scientifique maternité et travail* [scientific group on pregnancy and work] at the Institut national de santé publique du Québec is producing systematic reviews of the scientific literature.

Highlights

- The overall workload is evaluated by means of the cumulative set of occupational conditions, the level of physical activity and the level of energy expenditure.
- Exposure to an increased number of occupational conditions is linked to increased preterm deliveries and, to a lesser extent, to increased small-for-gestational-age births.
- Increases in the incidence of low-birthweight and high blood pressure during pregnancy are suspected in the presence of two or three occupational conditions.
- Excessive preterm deliveries and low-birthweights are suspected during exposure to high and moderate levels of physical activity, respectively.
- Different effects of energy expenditure are suspected, i.e., lower birthweight, an increase in spontaneous abortions and a higher incidence of high blood pressure during pregnancy in the presence of a high level of activity, and increased small-for-gestational-age births in the case of moderate and high levels of activity.

Introduction

The work that pregnant workers perform often includes several occupational conditions such as being in a standing position, lifting weights, inconvenient schedules, and so on. Québec data indicate that nearly one female worker in five appears to be exposed to at least three or four such occupational conditions.^{2,3}

This study is intended to analyze and summarize the scientific knowledge available concerning the impact of exposure to the overall workload on pregnancy.

Methodology

Using the OvidSP platform, the Medline and Embase databases were queried to pinpoint original epidemiological studies that evaluated the impact of the overall workload on pregnancy.

A systematic evaluation of each study was conducted from the standpoint of:

- the selection and participation rates of the population studied;
- the definition and measurement of the pregnancy outcome studied;
- the definition and method of measurement of the exposure;
- the choice of the (unexposed) control group; and
- control for potential confounding factors.

An assessment of each study makes it possible for a validity score to be assigned to it and allows for an evaluation of risks to its validity according to external validity, the selection of subjects, the collection of information on exposure and control for potential confounding factors.

For each “overall workload – pregnancy outcome” dyad, if it is possible to combine the results, a meta-analysis provides a summary result that agglomerates the results stemming from the different studies. The meta-analysis also makes it possible to assess the level of divergence between the results studied (heterogeneity), explore their sources and conduct sensitivity analyses that are useful for evaluating the validity of the result of the dyad. When

the number of studies is sufficient, a meta-regression is also carried out to round out the meta-analysis and obtain a summary result adjusted simultaneously for different validity-undermining risks.

Lastly, the level of confidence for a dyad’s results is established according to the strength of evidence based on biological plausibility, statistical quality, validity, coherence and publication bias.

Findings

Thirty-eight original studies were analyzed. The three main ways to evaluate the overall workload are the cumulative set of occupational conditions, the level of physical activity and the level of energy expenditure. Table 1 summarizes the findings.

In the case of spontaneous abortion, only exposure to a high level of energy expenditure is linked to a suspicion of increased risk.

An increased risk of preterm delivery of 18%, 30%, 44% and 108% exists in the presence of an increasing number of occupational conditions. When the level of physical activity is high an increased risk of preterm delivery is suspected.

Increases in the risk of small-for-gestational-age births of 13% to 26% have been noted in the presence of an increasing number of occupational conditions. When the level of energy expenditure is moderate or high increases in small-for-gestational-age births are suspected. On the other hand, the absence of higher risk of small-for-gestational-age births is suspected if the level of physical activity is moderate.

Increases in the risk of low-birthweight are suspected in the case of exposure to two occupational conditions or at a moderate level of physical activity, or if the level of energy expenditure is high.

Increases in the risk of gestational hypertension are suspected in the presence of two or three occupational conditions or a high level of energy expenditure in the short term.

The data do not allow us to draw conclusions for the other dyads evaluated.

Conclusion

Exposure to an increasing number of occupational conditions is linked to the risks of preterm delivery and small-for-gestational-age births. The strength of evidence of such associations is usually level II, which corresponds to sufficient evidence of higher risk.

The strength of evidence of the other associations observed is level III, which corresponds to a suspicion of higher risk, i.e., higher risk of low-birthweight and gestational hypertension in the presence of two or three occupational conditions, and the associations observed

for various adverse pregnancy outcomes related to the level of physical activity and to the level of energy expenditure.

Overall, the results suggest that the accumulation of occupational conditions and the intensity of the workload can increase the number of certain adverse pregnancy outcomes.

The global nature of working conditions should be taken into account when the workstations of pregnant women are evaluated under the For a Safe Maternity Experience program.

Table 1 Summary of the results: strength of evidence and summary result according to overall workload exposure and for each pregnancy outcome

Overall workload exposure	Strength of evidence ^a and summary result ^b for:				
	Spontaneous abortion	Preterm delivery	Small-for-gestational-age	Low-birthweight	Gestational hypertension or pre-eclampsia
<i>Number of occupational conditions</i>					
1	IV; 1.06	II; 1.18	II; 1.13	IV; 1.66	IV; 0.90
2		II; 1.30	II; 1.20	III; 1.79	III; 3.30
3	IV; 0.72	II; 1.44	III; 1.24	IV; 1.86	
4 or more		II; 2.08 ^c	II; 1.26		
<i>Level of physical activity</i>					
Moderate	IV; 0.43	IV; 1.10	V; 0.95	III; 1.17	Pre-eclampsia: IV; 2.08
High	IV; 0.44	III; 1.85	IV; 1.08	IV; 1.14	
<i>Level of energy expenditure</i>					
Moderate	IV; 0.70	IV; 0.66	III; 1.30	IV; 1.12	IV; 1.07
High	III; 1.40	IV; 1.18	III; 2.40	III; - roughly 200 g	IV; 1.1
<i>Level of energy expenditure in the short term</i>					
Moderate					IV; 1.4
High					III; 2.1

^a Strength of evidence levels: II (sufficient evidence of higher risk), III (suspicion of higher risk), IV (inconclusive data), V (suspected absence of higher risk).

^b The summary result estimates the ratio of the risk of exposed workers to the risk of unexposed workers. Therefore, a summary result of 1.18 corresponds to 18% excess risk.

^c P-trend value < 0.0001.

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AUTHOR

Agathe Croteau, medical specialist
Direction des risques biologiques et de la santé au travail

TRANSLATION

Terrance Hugues

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