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Physical exercise and pelvic girdle pain in pregnancy: A nested case–control study within the Danish National Birth Cohort

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ABSTRACT

Objective: Pelvic girdle pain is a frequent cause of sick leave among pregnant women in Denmark. Studies regarding prevention of pelvic girdle pain are sparse. The aim of this study was to examine the association between physical exercise and pelvic girdle pain in pregnancy.
Study design: A nested case–control study within the Danish National Birth Cohort (n = 5304).
Methods: This study used self-reported data on pelvic girdle pain obtained from an interview six months after childbirth. Information on physical exercise was obtained from the pregnancy interview around gestational week 16. The association was estimated using logistic regression analysis.
Results: Physical exercise in pregnancy was associated with decreased risk of overall pelvic girdle pain (OR = 0.87; 95% CI: 0.77–0.99, p = 0.028). Tests for trend indicated decreasing odds for pelvic girdle pain with increasing number of hours per week spent on exercise (p < 0.001). Compared to no exercise, swimming was associated with a decreased risk of pelvic girdle pain (OR = 0.73; 95% CI: 0.58–0.91, p = 0.005).
Conclusions: The findings suggest a possible protective effect of physical exercise on pelvic girdle pain during pregnancy.

Introduction

Pelvic girdle pain is reported in approximately 20% of pregnancies, but the prevalence varies substantially between studies, most likely due to a lack of concise diagnostic criteria [1–3]. The highest intensity of pelvic girdle pain is described during gestational weeks 24–36 [1]. Of all pregnant women 2–7% still report some degree of pelvic girdle pain 3–12 months after childbirth [1,4,5].

Pelvic girdle pain is defined by pain between the posterior iliac crest and the gluteal fold, which may radiate in the posterior thigh, and can also occur in the symphysis [2]. Pelvic girdle pain during pregnancy affects the ability to perform normal daily activities such as standing, walking, lifting, climbing stairs and turning over in bed [1,2,6], and often the affected women feel unable to meet their own and others' expectations causing disappointment, sadness or frustration [7]. In addition to personal costs, pelvic girdle pain is a socioeconomic burden as it is one of the most frequent reasons for sick leave among pregnant women in Denmark [8,9]. Previous low back pain and previous pregnancy-related pelvic girdle pain are the greatest and most well-established risk factors for pelvic girdle pain [1,4,10], although suggested risk factors also include low education level, increasing parity, pre-pregnancy body mass index (BMI) > 30 kg/m^2, smoking in pregnancy, age at menarche ≤11 years, emotional distress, high-strain psychosocial work environment, and physically strenuous work [1,4,5,10–16].

Physical exercise has shown to be effective as prevention and treatment for musculoskeletal diseases in non-pregnant women [17]. Despite this, only three randomized controlled trials have examined physical exercise regimes as preventive or treating interventions on specific pelvic girdle pain among pregnant women [18–20], and only one of the three studies found an effect of specific stabilizing exercises as treatment for pelvic girdle pain. However, three cohort studies found that women who were physically active in their pregnancy had a decreased risk of pelvic girdle pain, although measurements of either pelvic girdle pain or physical exercise was a minor part of these studies and lacked details [4,21,22]. Therefore, in order to promote health in pregnancy and reduce personal and economical costs, larger population-based studies with a specific focus on pelvic girdle pain and physical exercise are required to examine if the amount and type of exercise have an impact on pelvic girdle pain in pregnancy.

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The aim of the present study was to examine the association between the amount and type of physical exercise in early/mid pregnancy, and mild and severe pelvic girdle pain. The initial hypothesis was that physical exercise had a preventive effect on pelvic girdle pain in pregnancy, and that increasing the amount of physical exercise would result in decreasing odds for pelvic girdle pain.

Methods

The current study was based on the data from the Danish National Birth Cohort (DNBC) in which 101,042 women participated during 1996–2002 [23]. The women were informed about the DNBC at the first antenatal visit with their general practitioner or midwife. Women with a permanent address in Denmark, who did not plan for an induced abortion, and who spoke Danish well enough to participate in telephone interviews, were eligible for the cohort. The participants gave informed written consent before inclusion. From this mother cohort, during the period April 2000–November 2001, an entry question about pelvic girdle pain was used to select women for the present pelvic pain study. The pelvic pain study was approved by the DNBC Steering group (journal number: 2010-13) and the Danish Data Protection Agency (journal number: 2010-41-4792).

For the present study we used data from two computer-assisted telephone-interviews which was a part of the DNBC: one in pregnancy at approximately gestational week 16 (median 16 completed weeks, 10th and 90th percentiles: 12 and 23 weeks, referred to as "early/mid pregnancy") and one when the child was six months old. The cohort is described in detail by Olsen et al. [23].

In the interview six months after childbirth, the question "Did you feel pelvic girdle pain to an extent that affected your ability to walk during pregnancy or shortly after delivery?" was used as an entry question to identify cases and controls for the present pelvic pain study (for practical reasons, and due to the fact that extremely few cases of pelvic girdle pain initiates after delivery, we refer to pelvic girdle pain in pregnancy throughout the paper leaving out "shortly after delivery"). All women who answered "yes" to this entry question on pelvic girdle pain during the data collection period were considered cases, and additional questions were prompted, e.g. on specific pain localization. Women who indicated pain in the back higher than the iliac crest, or pain in the stomach were excluded (n = 709), and women who reported pain around the symphysis, the sacro-iliac joints, or the low back region below the iliac crest were kept in the case group.

Information on pain in daily activities was used to determine mild and severe cases. The women were asked: "Did you feel pain when [turning over in bed/walking/getting up from a dining room chair/getting up from a sofa/walking on stairs]?" and women could answer "no pain", "some pain" or "strong pain". Cases which reported "no pain" in all five questions were excluded (n = 67). Mild cases were defined as women who reported "some pain" in at least one daily function and/or "strong pain" in not more than one daily function, and severe cases as women who reported "strong pain" in at least two daily functions. This categorization of cases can be seen in two other Danish cohort studies [5,12].

Controls were defined as all women who answered "no" to the entry question during five single weeks over the time period April 2000–November 2001. In order to avoid any seasonal variations regarding joint pain the weeks were spread equally over the recruitment period. Five weeks were chosen to obtain approximately the same number of controls as cases. Controls were also asked about pain in daily activities, and it turned out that 40% reported pain levels equivalent to the mild case definition, and 5.7% equivalent to the severe case definition. We excluded the controls who reported pain levels equivalent to the severe case group from the analysis (n = 171). Hence, the final study population comprised 777 mild cases, 1705 severe cases and 2822 controls, i.e. a total of 5304 women with a singleton delivery, who had completed both the first pregnancy interview and the interview six months after childbirth (Fig. 1).

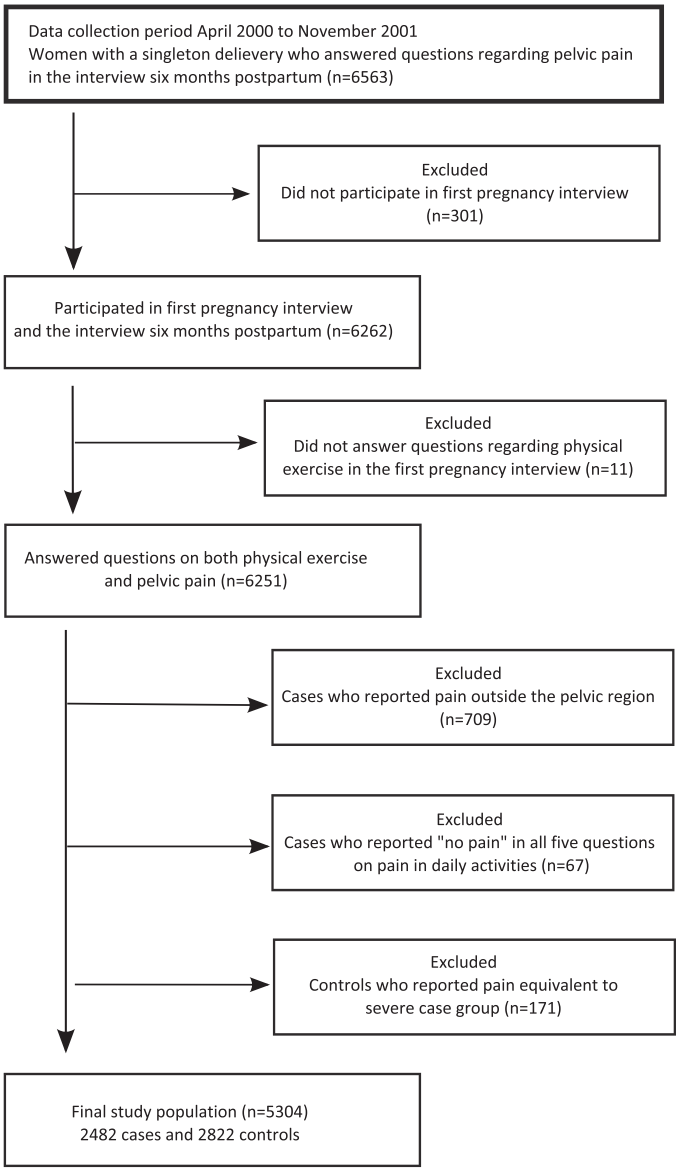

Fig. 1. Flow chart of the participants in the study.

Exposure measures

In the pregnancy interview, the women were asked: (1) "Now that you are pregnant, do you engage in any kind of exercise?", and in the case of a positive answer: (2) "What kind of exercise do you engage in?", (3) "How many times a week do you engage in … (answer in question 2)?", (4) "How many minutes at a time do you engage in … (answer in question 2)?", and (5) "Do you engage in other types of exercise?" A positive answer to the last question released a loop with the aforementioned questions until a negative response was given. The total number of minutes spent on exercise per week was calculated, based on the frequency and duration of exercise activities, and categorized into hours per week.

The type of exercise was registered among 13 pre-defined options, or, if an answer did not fit into the existing categories, the exercise type was written in text by the interviewer. These written