

Difficulties Pertaining to the Musculoskeletal System That Occur During Pregnancy, Delivery and the Period Following Childbirth

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Abstract

Background: Pregnancy-induced hormonal and physiologic changes increase the risk of musculoskeletal problems in pregnancy. The purpose of this report is to provide a comprehensive look at the musculoskeletal pain and symptoms experienced during pregnancy.

Methods: A total of 184 women (mean age 30.9 ± 5.0 years) who gave birth in the obstetrics clinic of RNT Medical College, Udaipur were included in the study. The participants who had given birth at 37–42 weeks of pregnancy (term pregnancy) and aged over 18 years were selected for participation. Basic demographic and clinical characteristics of the participants including age, body mass index, weight gained during pregnancy, education level, occupation, parity, sex of baby, and exercise habits were collected from the medical chart and face-to-face interviews. Musculoskeletal pain sites were defined as hand–wrist, elbow, shoulder, neck, back, low back, hip, knee, and ankle–foot in a diagram of the human body. The interviews with participants were performed to assess their musculoskeletal pain separately at each trimester follow-up visit.

Results: The most frequent musculoskeletal complaints during pregnancy were low back pain ($n = 130, 70.7\%$), back pain ($n = 80, 43.5\%$), hand–wrist ($n = 61, 33.2\%$) and hip pain ($n = 59, 32.1\%$). The participants experienced musculoskeletal pain most in the third trimester except for elbow, shoulder and neck pain compared with the first and second trimesters ($p < 0.05$).

Conclusions: The results of the study suggest that numerous musculoskeletal problems may complicate pregnancy especially in the third trimester.

Keywords: Musculoskeletal Problems, Pregnancy, Delivery, Childbirth.

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Introduction

Pregnancy-induced biomechanical, hormonal, and vascular changes are likely to give rise to a wide variety of musculoskeletal problems. [1] The enlarging uterus alters body's center of gravity and applies mechanical stress on the

body. [2] Joint laxity develops secondary to hormone level fluctuations. Fluid retention leads to compression of soft tissues in pregnancy. Consequently, a pregnant woman is susceptible to musculoskeletal injuries. It has been suggested that almost

all women complain of musculoskeletal problems to some extent. A one quarter of the pregnant women experience at least temporarily disabling symptoms during pregnancy. [3] Spinal pain has been reported as the most frequent disorder.[4] Other common problems consist of lower and upper extremity pain, muscle cramps and peripheral neuropathies. [3,4]

Hormonal and physiological changes occurring during pregnancy can cause numerous musculoskeletal problems such as lower back pain, carpal tunnel syndrome and tendinitis. An overview of the literature shows that the most common problem is low back pain in pregnancy, the incidence was found to be from 30% to 70% [5-8]. The second most common musculoskeletal problem has been reported as carpal tunnel syndrome [9]. Another problem experienced in pregnancy is muscle cramp which mostly occurs during sleep and only lasting a few seconds [10].

Pregnancy is a time of many physical and physiological changes. The gravida must nurture and host the fetus, but also adapt to a new body habitus and alterations in the hormonal milieu. Not surprisingly, these changes impact the musculoskeletal system, which can develop a variety of problems, such as back pain, separation of the pelvic bones, transient osteoporosis, and tendonitis. Pain related to the musculoskeletal system in pregnant women will be reviewed here. Neurological disorders, myopathies, and inflammatory muscle diseases are discussed separately

Objectives

This study was conducted to identify the most common musculoskeletal problems according to trimester, experienced by pregnant women.

Methods

Study design and participants

The study was conducted for a period of two years at the Department of Physical medicine and rehabilitation, and Obstetrics

and Gynaecology, RNT Medical College, Udaipur. A total of 184 women were included in the study. All successive pregnant women were enrolled. Antenatal and postnatal follow up of the participants were conducted in the same clinic. The study included participants who gave birth at 37– 42weeks of pregnancy (term pregnancy), were aged over 18years, and were able to converse and complete the questionnaires in Udaipur. Those who had a chronic musculoskeletal disorder and history of orthopaedic surgery that may be a reason of musculoskeletal symptoms other than pregnancy itself were excluded. The study adhered to the guidelines of the Declaration of Helsinki and informed consent was obtained from all participants.

Procedures

The basic demographic and clinical characteristics of the participants including age, body mass index (BMI), weight gained during pregnancy, education level, occupation, parity, sex of infant, and exercise habits were collected from the medical charts and face-to-face interviews. A regular (at least twice a week) or irregular (not each week of the pregnancy) aerobic exercise of any kind including walking, jogging, swimming, biking, etc. irrespective of duration and intensity was questioned during pregnancy. The musculoskeletal complaints of the participants were questioned with interviews. Musculoskeletal pain sites were defined as hand–wrist, elbow, shoulder, neck, back, low back, hip, knee, and ankle–foot. The above named body parts were shown to participants in a diagram of a human body in the questionnaire. Participants were asked if they had pain in those musculoskeletal sites during pregnancy.

Statistical analysis

Data analysis was performed using SPSS for Windows, version 15.0 (SPSS Inc.,

Chicago, IL, United States). The data were treated in a descriptive and inferential manner. The categorical variables were presented as absolute values and percentages, and the numerical variables as means and standard deviations. The chi-square test was used to compare the data. The statistical significance level was determined at $p < 0.05$.

One hundred and twenty pregnant women who is older than 18, attending the Physical Medicine and Rehabilitation Clinic between two years, were evaluated retrospectively. Pregnant patients who have age, weight, size, employment status, duration of pregnancy, nulli/multi-parity, presence of other disorders, application

complaints, the diagnosis information were included to the study.

Results

A total of 184 female participants with a mean age of 30.9 ± 5.0 years participated in the study. Most of the participants had a university level of education (53.2%). The mean weight gained during pregnancy was 13.1 ± 4.8 kgs. Parity of the participants was mostly two or more (71.2%). The sex of the infants was male in 87 (47.3%) births and female in 97 (52.7%) births. Only 25 participants (13.6%) declared that they had undertaken a regular exercise program during pregnancy. All the demographic and clinical characteristics of the participants are presented in Table 1.

Table 1: Patient characteristics (n = 184)

	n	%
Age (years)*	30.9 ± 5.0	
BMI (kg/m²)*	24.0 ± 3.8	
Weight gained during pregnancy (kg)*	13.1 ± 4.8	
Education level		
Primary	19	8.8
Secondary	10	7.0
High school	58	30.0
University	97	54.2
Employed		
Yes	69	35.9
No	115	64.1
Parity		
1	52	29.8
2	86	45.2
>3	45	26.0
Sex of infant		
Male	86	48.3
Female	96	58.7
Exercise during pregnancy		
Regular	24	14.6
Irregular	54	28.0
No	105	58.4
*Mean ± standard deviation. BMI, body mass index.		

Table 2: Musculoskeletal pain sites of the participants (n = 184)

	First trimester n (%)	Second trimester n (%)	Third trimester n (%)
Hand–wrist	16 (9.2)	32 (16.8)*	54 (29.3)\$‡
Elbow	2 (1.1)	6 (3.8)	6 (2.7)
Shoulder	10 (6.0)	14 (7.6)	14 (8.2)
Neck	13 (7.1)	17 (8.7)	19 (10.9)\$
Back	33 (17.4)	42 (22.8)	76 (40.8)\$‡
Low back	51 (26.6)	74 (39.7)*	120 (86.8)\$‡
Hip	19 (9.8)	33 (17.4)*	53 (29.9)\$‡
Knee	10 (4.9)	16 (8.2)	22 (13.0)\$‡
Ankle–foot	13 (6.5)	18 (9.2)	34 (19.6)\$‡
*Significant difference in comparison with first trimester. \$Significant difference in comparison with first trimester. ‡Significant difference in comparison with second trimester			

Table 3 presents the demographic characteristics of the participants.

Table 3: The demographic characteristics of the pregnant women who have musculoskeletal problems

	120 pregnant women - n (%)
Age (mean±SD)	26.98 ± 6.02
Weight (mean±SD) (kg)	72.65 ± 13.36
Height (mean±SD) (cm)	161.89±6.70
Socioeconomic status	
Working	13 (10%)
Not working	107 (90%)
Presence of gestational diabetes	1 (0.8%)
Presence of chronic disease	11 (9.2%)
Parity	
Nulliparity	46 (36.7%)
Multiparity	74 (63.3%)
Total	120 (100%)

Discussion

The results of this study framed a comprehensive analysis of the musculoskeletal disorders experienced during pregnancy. LBP was found to be the most frequent musculoskeletal complaint during pregnancy. The findings presented an increase in musculoskeletal symptoms in the third trimester. Various musculoskeletal problems may be an important source of discomfort during pregnancy. Pregnancy causes considerable physiological effects on a woman's body, affecting not only the cardiovascular, endocrine, and renal systems, but also the musculoskeletal

system. Even though the musculoskeletal system can be affected at any time in pregnancy, this may be most prominent in the third trimester. The results of the present study showed there is a significant increase in hand–wrist, neck, back, low back, hip, knee, and ankle–foot pain in the third trimester compared with the other trimesters. It has been reported that postural and hormonal fluctuations, weight gain and fluid retention may account for increased musculoskeletal pain in the third trimester. [11] More studies are needed to better understand the pathophysiology of musculoskeletal problems during

pregnancy. It would enable the physician to make timely diagnoses and management.

LBP is very common during pregnancy and is estimated affecting 50–75% of pregnant women. [12] In accordance, 70% of the pregnant women had LBP a compensatory effect, the paraspinal muscles are forced to undertake the whole function, become fatigued and thus, a cause of LBP. [12,13] During pregnancy, the alteration of the mechanics requires the lower-extremity joints to adapt by absorbing extra force. [11] Hip, knee, foot pain and leg spasms have been identified as the most common lower-extremity problems experienced during pregnancy. It has been shown that the hip is the most commonly affected area in the lower extremity. Vullo and colleagues [14] reported that 34% of pregnant women experienced hip pain. Similarly, in the present study, 32% of women reported hip pain. Many pregnant women experience hip pain in their second or third trimester. It may be considered as a result of increase in mechanical load to hip joints in later stages of the pregnancy. However, some specific disorders should also be assessed. In a pregnant woman presenting with hip pain, transient osteoporosis of the hip or osteonecrosis of the femoral head must be considered. In addition, sacral fractures, acetabular labral tears, symphysis pubis diastasis or dysfunction, cauda equina syndrome, and sacroiliitis are rare causes of hip pain in pregnancy. [15–19]

The most frequent musculoskeletal pathology was lower back pain (66.7%) in pregnant women that were seen in Physical Therapy and Rehabilitation department. These results are consistent with the results obtained from several studies in the literature. In one study, lower back pain was reported in 68.8% of the 105 mothers who had given birth within the last 6 months [20] and in another study it was reported 79.8% [21]. Not only in pregnancy but also in other patients, low back pain was

reported the most common reason for admission by a pain clinic [22].

Conclusion

Pregnant women face multiple musculoskeletal pain and symptoms, especially in the third trimester. LBP, back pain, hip pain and CTS are the most frequent painful conditions in pregnant women. The present study provides multiple entry points to further investigate the many musculoskeletal ailments reported, as well as the underlying physiological complexities associated with pregnancy.

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