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MUSCULOSKELETAL CONSIDERATIONS DURING PREGNANCY

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Abstract

Pregnancy related musculoskeletal impairment is a common complaint among pregnant women. It can potentially have a negative impact on their quality of life. The aim of this study is to calculate the incidence of pregnancy related musculo-skeletal disorders, evaluate the most common disorders and to determine the possible risk factors.

This is a prospective analytic study conducted in Basrah Governorate between January 2013-January 2014. Pregnant women attended the Primary Health Care Centers and the Gynecological & Obstetric Outpatient Department in Basrah hospitals were asked about any history of musculoskeletal conditions during the current pregnancy, further information was obtained and physical examination was done for patients who had history of musculoskeletal conditions, no investigation was done and there was no follow-up of the patients. A total of 500 pregnant women with complete data were recruited. Statistical analyses were performed using SPSS version 14, incidence and frequency were calculated using standard technique.

Two hundred-sixty of the patients out of the 500 had pregnancy related musculoskeletal conditions during their current pregnancy with overall incidence of 52%. One hundred-sixty two of the patients have pregnancy related low back pain which represent 62.3% of the total disorders, followed by carpal tunnel syndrome(CTS) in 54 patients who had pregnancy related carpal tunnel syndrome (20.8%), calf pain in 28 patients, knee pain in 27 patients, hip pain in 21 patients, plantar fasciitis in 16 patients, neck pain in 6 patients, Dequverain's disease in 5 patients and one patient only had meralgia parasthetica.

In conclusion, the pregnancy related musculoskeletal disorders are common and it is not trivial, for some women it may be the beginning of lifelong chronic discomfort and for others it may cause considerable disability and distress during pregnancy. Most of these problems can be identified early and treated effectively by active self-management strategies; administered through good antenatal care.

Introduction

Pregnancy can be remembered as a joyful and exciting time, but for some women, pain, discomfort or illness can darken this picture. Orthopaedic manifestation during pregnancy is a serious problem due to the risk of inducing damage to the mother and to the fetus either because of the disease itself or its treatment, while other orthopaedic pathologies may affect the progress of pregnancy and delivery in a positive or negative way[1]. Pregnancy is a normal physiologic state that is characterized by growth of the fetus, with extensive biomechanical, physiological and structural changes occur to provide a suitable environment for nutrition, growth and development of the fetus as well as to prepare the mother for the process of parturition[2].

Many of these changes are mediated by the hormones progesterone, relaxin and estrogen. These hormones are known to affect the musculoskeletal system by changing the structure of connective tissue and increase mobility of joint

capsules, spinal segment as well as the pelvic joint structure[3]. Relaxin secreted by the corpus luteum from beginning of pregnancy till the 12th week of gestation, then from placenta, it soften the ligaments and makes the joints more mobile and so more vulnerable to injuries[4].

Artal and Toole[5] reported that hormonal changes increased ligamentous laxity and predisposing pregnant women to increased incidence of strains and sprains.

Weight gain during pregnancy alter body contour, the front of abdomen become protuberant together with exaggerated lumbar lordosis change the gait of pregnant women and lead to increase frequency of fall and high prevalence (50%) of low back pain[5].

Soft-tissue edema during pregnancy is reported by approximately 80% of women, most notable during the last 8 wks of pregnancy making women more likely to develope peripheral nerve entrapment during pregnancy[6] .

The weight gain during pregnancy may significantly increase the forces across joints such as hips and knees as much as 100% during daily activity, this is together with joints laxity may cause discomfort to these normal joints or increase damage to previously arthritic or unstable joints[5].

Treatment of musculoskeletal disorders during pregnancy needs very special precautions particularly using of medications. keeping in mind no prescription or procedure is absolutely safe during pregnancy regarding the potential effects on the mother and foetus[1].

Patients and Methods

Pregnant women attended the Primary Health Care Centers and the Gynecological & Obstetric Outpatient Department of the central and peripheral Basrah hospitals were randomly selected disregarding their age, the gestational age, number of pregnancies, and the presence of musculoskeletal disorders. The pregnant women were asked about any history of musculoskeletal conditions during the current pregnancy.

Biosocial data was obtained through the questionnaire including maternal age, gestational age, gravidity, parity, occupation and residency. Variables relating to the pain obtained included site, onset, frequency, duration, character, severity, radiation, aggravating and relieving factors, associated symptoms and physical dysfunction experienced during the painful episode as well as the treatment options sought for the relief of pain. Further information was also collected regarding past medical, surgical and drug history.

Detail neurological examination of upper and lower limbs was performed for every patient.

Special tests included Phalen's test, reverse Phalen's test, Tinel's test and carpal tunnel compression test for carpal tunnel syndrome; Ulnar nerve compression test for ulnar nerve compression; Finkelstein's test for Dequervain's disease; straight leg raising test, cross Straight leg raising test, Lasegue's test and bowstring for nerve root irritation; Dorsiflexion-eversion test of the foot for tarsal tunnel syndrome and test for plantar fasciitis.

Height was measured without shoes with a wall-mounted tape measure to the nearest centimeter and weight was measured with indoor clothing without shoes on a lever balance as kilograms. Body mass index was calculated for every patient with pregnancy related musculoskeletal disorders. No specific investigation was done and there was no follow-up of the patients.

A total 500 pregnant women with complete data were recruited. Statistical analyses were performed using SPSS version 14 statistical software tool, incidence and frequency were calculated using standard techniques.

Results

Two hundred-sixty of the patients out of 500 pregnant women attended the Antenatal Care in Primary Health Care Centers and Gynecological & Obstetric Outpatient Department of the central and peripheral Basrah hospitals between January 2013-January 2014, have pregnancy related musculoskeletal conditions during their present pregnancy with overall incidence of 52%.

Fifty-eight patients(22.3%) were <20 years, one hundred-forty patients(53.8%) presented between 20–30 years of age, fifty-five patients(21.2%) presented between 31–40 years of age and seven patients(2.7%) were >40 years of age.

Thirty seven patients were in the 1st trimester(14.2%), fifty-seven patients(21.9%) patients were in 2nd trimester and one hundred sixty-six(63.8%) patients were in 3rd trimester.

Forty-six(17.7%) patients were nullipara, one hundred eighty-seven patients(71.9%) were multipara and twenty-seven patients(10.4%) were grand multipara(seven or more pregnancies).

Two hundred twenty five patients were house wives (85.7%), twenty patients(7.6%) patients were teachers, five patients(1.9%) patients were typists, three patients (1.2%) were accountancy, three patients(1.2%) were students, two patient (0.8%) were Lab. Workers, two patient (0.8%) were nurses and two patient(0.8%) patients were pharmacist.

One hundred-fifty eight patients (60.8%) were from rural areas while one hundred-two patients(39.2%) were from urban areas.

One patient with BMI <18.5 (0.4%), fifty patients (19.2%) with BMI (18.5-25) and two hundred-nine patients(80.4%) with BMI >25.

Table I: Incidence and frequency of pregnancy related musculoskeletal disorders:

Musculoskeletal disorder	Responses No.	Incidence Rate	Frequency
Low Back Pain	162	32.4%	62.3%
CTS	54	10.8%	20.8%
Calf Pain	28	5.6%	10.8%
knee Pain	27	5.4%	10.4%
Hip Pain	21	4.2%	8.1%
Plantar Fasciitis	16	3.2%	6.2%
Neck Pain	6	1.2%	2.3%
Dequervain's Dis.	5	1%	2%
Meralgia Parasth.	1	0.2%	0.4%

Tables II-VIII demonstrates the results for low back pain only in regard to number, pattern, age, gestational age, parity, body mass index, occupation and residency of the patients.

Table II: Pattern of Low Back Pain

Pattern of low back pain	No.	Percentage %
Posterior propagation pain	88	54.3
Lumbar pain	36	22.2
LBP with Radicular Pain	38	23.5
Total	162	100

Table III: Relation between low back pain and age of the patients

Low Back Pain	Age of the Patients				Total
	<20 Years	20-30 Years	31-40 Years	>40 Years	
No.	34	87	35	6	162
Percentage%	21	53.7	21.6	3.7	100

Table IV: Relation between low back pain and gestational age

Low back pain	Gestational age			Total
	1st Trimester	2nd Trimester	3rd Trimester	
No.	28	43	91	162
Percentage%	17.3	26.5	56.2	100

Table V: Relation between low back pain and parity

Low Back Pain	Parity			Total
	Nullipara	Multipara	Grand multipara	
No.	28	117	17	162
Percentage%	17.3	72.2	10.5	100

Table VI: Relation between low back pain and body mass index

Low Back Pain	Body Mass Index			Total
	<18.5	18.5-25	>25	
No.	1	31	130	162
Percentage%	0.6	19.1	80.3	100

TableVII: Relation between low back pain and occupation of the patients

Low Back Pain	Occupation								Total
	Account.	Typist	House Wife	Lab. Worker	Nurse	Pharmacy	Student	Teach.	
No.	2	4	141	1	1	2	0	11	162
%	1.2	2.5	87.1	0.6	0.6	1.2	0	6.8	100

Table VIII: Relation between low back pain and residency of the patients

Low Back Pain	Residency		Total
	Rural	Urban	
No.	108	54	162
Percentage%	66.7	33.3	100

Tables IX-XIII shows the results for carpal tunnel syndrome (CTS) in regard to pattern, age, gestational age, parity and body mass index.

Table IX: Pattern of CTS:

Pattern of CTS	No.	Percentage %
Bilateral CTS	38	70.4
Right side CTS	12	22.2
Left side CTS	4	7.4
Total	54	100

Table X: Relation between CTS and the age of the patients

CTS	Age of the patients				Total
	<20 Years	20-30 Years	31-40 Years	>40 Years	
NO.	16	25	12	1	54
Percentage%	29.6	46.3	22.2	1.9	100

Table XI: Relation between CTS and gestational age

CTS	Gestational Age			Total
	1st Trimester	2nd Trimester	3rd Trimester	
	5	11	38	54
Percentage%	9.2	20.4	70.4	100

Table XII: Relation between CTS and parity:

CTS	Parity			Total
	Nullipara	Multipara	Grand multipara	
No.	11	37	6	54
Percentage%	20.4	68.5	11.1	100

Table XIII: Relation between CTS and body mass index

CTS	Body Mass Index			Total
	<18.5	18.5-25	>25	
No.	0	11	43	54
Percentage%	0	20.4	79.6	100

Patients with special characteristics may have possible risk factors related to muscloskeletal disorders that occur during pregnancy as shown in table XIV.

Table XIV: Possible risk factors for pregnancy related musculoskeletal disorders (PRMSD)

Possible Risk Factors	Responses		Percent of Women with PRMSD
	Women Without PRMSD	Women With PRMSD	Percentage
Residency (Rural Area)	111	158	58.7%
Body Weight (BMI>25 Kg/m2)	154	209	57.5%
Occupation (House Wife)	200	223	52.7%
Parity(Multipara)	169	187	52.5%
Gestational Age (3rd Trimester)	171	166	49.3%
Age(20-30) Years	158	140	47%

Discussion

Pregnancy can be a time of joy and exciting anticipation, yet for some women the feeling can be tarnished by pain, discomfort and feeling of being unwell. It is often due to many of structural and hormonal changes that involved the spine, pelvis and related structures of joints and nerves during period of pregnancy[7].

The results of this study showed that 260 pregnant women had musculoskeletal conditions during their current pregnancy with overall incidence of 52%. Low back pain is the most frequent complaint (62.3%) followed by CTS (20.8%).

These results can be discussed from social aspect as majority of women in our locality performed nearly all the house duties like preparation of food, washing of clothes, rearing of children, house decorating and shopping. They are often multipara with short interval between pregnancies and most of them are overweighed before the pregnancy and have poor antenatal care. These factors together illustrate the high incidence of pregnancy related musculoskeletal disorders in our locality.

Most patients with pregnancy related musculoskeletal disorders were between 20-30 years of age (53.8%), and were in the 3rd trimester (63.8%), they were multipara (71.9%), had BMI >25Kg/m2 (80.4%), came from rural area (60.8%) house wives (85.7%). Unfortunately according to our knowledge, there is no similar study which take pregnancy related musculoskeletal disorders all together in order to compare our results with it.

The incidence of pregnancy related musculoskeletal low back pain in this study was (32.4%), most of these patients with pregnancy related musculoskeletal low back were presented between 20-30, 31-40 years of age (53.7%),(21.6%) respectively, in the 3rd trimester (56.2%), they were multipara (72.2%) and had BMI>25 Kg/m2 (80.3%).

This compares favorably with the experience of Shaheen et al[8] who showed

that incidence of pregnancy related musculoskeletal low back pain was 36.6%, and 94.21% of the patients were in between 20-40 years of age and 67.59% were multigravida. The dissimilarity between the two studies was the weight of patient; Shaheen showed that only 15.97% of patients had body weight >70 Kg.

This study showed that the incidence of carpal tunnel syndrome among the pregnant women was 10.8%, most of them were between 20-30 years of age (46.3%), in 3rd trimester (70.4%), they were multipara (68.5%), had bilateral CTS (70.4%) and with BMI>25 Kg/m2 (79.6%).

A similar results obtained by study performed by Shadab et al[9] who revealed that the incidence of pregnancy related CTS was 22.3%, and CTS was bilateral in 68% of cases. Another study[10] showed that most cases of pregnant women that had CTS were in the 3rd trimester(49%), the most age group of women that clinically had CTS was 25-50 years (76.6 %) and association between CTS and parity was insignificant, this is in contrast with the findings of our study which show strong association between CTS incidence and parity.

This finding can be attributed to the fact that CTS is common in young patients because they are physically more active and most of cases were presented in the 3rd trimester as CTS is mostly asymptomatic in the early stages of pregnancy and become more evident as the pregnancy advanced due to exaggerated physiological changes that mediated by hormonal level especially soft tissue edema.

This study revealed that the possible risk factors for pregnancy related musculoskeletal disorders were: Residency: most patients came from rural area (58.7%), Body weight: most patients had BMI > 25 Kg/m2 (57.5%), Occupation: most patients were house wives (52.7%), Parity: most patients were multipara (52.5%), Gestational age: most patients were presented in the 3rd trimester (49.3%), Age: most patients were presented between 20-30 years of age (47%).

Conclusion:

1.The pregnancy related musculoskeletal disorders are common and the most common disorders were low back pain followed by carpal tunnel syndrome.

2. Most of the pregnancy related musculoskeletal disorders can be identified early and treated with active self-management strategies and by good antenatal care.

3. Restricted use of medication especially non-steroidal anti-inflammatory drugs among our patients despite of their sever complaint.

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