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Patient-oriented assessment of back pain in pregnancy

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Abstract Back pain is a common symptom in women during the last period of pregnancy. Only a few studies using validated patient-oriented tools have been undertaken on this topic. We report on a multicenter study on back pain in women during the last period of pregnancy, which involved seven Italian institutions. Seventy-six women in their 8th and 9th months were studied using the Italian validated version of the Roland questionnaire – a disease-specific patient-oriented tool for low back pain. Sixty-two percent of the women had gone through at least one previous pregnancy, and clinical data concerning both the period before all pregnancies and the period before the current pregnancy were acquired. The study found that 31% of the women had no back pain symptoms (Roland score 0), 40% scored from 1 to 4, 21% scored from 5 to 10, and 8% scored more than 10. With regard to the predictive factor, history of back pain and sciatica before the pregnancy were found to be associated with occurrence of back pain symptoms during pregnancy. Unexpectedly, our results showed that male sex of the fetus seems to be related to occurrence of back pain symptoms during pregnancy. However, back pain was not associated with having gone through previous pregnancies, nor was the Roland score related to the weight before pregnancy or to increment of weight during pregnancy. Evaluation of the patient's perspective made it possible to identify predictive factors for occurrence of back pain, thereby furnishing important information for the clinical approach to pregnancy.

Keywords Patient-oriented assessment · Questionnaire · Back pain · Pregnancy

Introduction

Back pain is one of the most frequent complaints during the last period of pregnancy, and a high incidence has been described in several studies [2, 9, 10, 13, 18, 22]. Since 1984, studies of low back pain have all been performed using patient-oriented tools for assessment [27]. Self-administered questionnaires are the instruments most commonly used to assess the patient's perspective in evaluating the clinical picture, and the usefulness of these instruments is widely accepted [24, 25]. Back pain during pregnancy has been evaluated in some recent papers in quantitative way, but only a few studies have analysed the symptoms from a qualitative point of view, using a validated patient-oriented tool [21, 29].

The mechanism behind back pain during pregnancy is not clear; different hypotheses are proposed in the literature, with no commonly accepted opinion. The factors that have been found to be associated with a high risk for developing back pain are: previous backache, multiparity, young age, and both mental and physical work [5, 16, 18, 19].

With regard to the definition of back pain, Östgaard [20, 22] differentiates back pain during pregnancy into

two types of pain pattern, one from the lumbar area and one from the posterior pelvis. In accordance with the literature, in the current study we consider "back pain" as an undifferentiated symptom, because patient-oriented tools are unable distinguish between the two types of pain.

The aim of our study was to assess the severity of back pain during the last period of pregnancy through a modern and comprehensive assessment of the patient perspective. We used a validated patient-oriented measurement, the Roland questionnaire, to obtain more comprehensive and consistent data on severity of symptoms and functional impairment.

Materials and methods

Seven Italian centers participated in the multicenter study on back pain in women during the last period of pregnancy – a study that had originally been proposed at the 1999 Italian Neurology Congress by the lumbar radiculopathy group. All centers adhered strictly to the protocol summarised here. The collaboration was performed according to the recently proposed guidelines for multicenter collaboration and clinical research in neurology [1, 14].

Data collection

Each center had to enrol at least ten consecutive women who were in their 8th or 9th pregnancy month, monitored in the laboratory of gynecology. Each patient was exhaustively informed of the current knowledge of back pain and its relationship with pregnancy and, in the context of this general information, they were also informed about the study. All patients enrolled in the study gave written informed consent. The study was based on the following summarised protocol.

Personal data

Gynecologists, orthopedics and neurologists acquired the following data by asking each patient to fill in a form: height, weight before pregnancy, whether the subject is a housewife, use of alcohol and tobacco, previous pregnancies, and back pain before pregnancy. The following data concerning the current pregnancy were also acquired: occurrence of edema (evaluated through fovea at the tibia after digital pressure, coded as absent, mild, severe), back pain symptoms, ultrasonography weight and sex of the fetus.

Patient-oriented data: Roland questionnaire

We used the Italian validated version of the disease-specific Roland questionnaire to assess back pain [27]. The questionnaire consists of 24 items providing a numerical score (range: 0=no disability, 24=severe disability), which inquires about the severity of symptoms and functional impairment. In agreement with previously described methodologies [23, 32] the questionnaire was submitted to patients before the medical evaluation by a nurse in the waiting room.

Statistical analysis

Statistical analysis was performed using the STAT-SOFT package (Statistica 4.5, Tusla, Okla.).

Because ordinal or nominal scales (such as the Roland questionnaire) were used for measurement, non-parametric analysis of the correlation was assessed by Spearman's rank correlation coefficient and group comparisons were assessed using the Mann-Whitney U test and the Chi-square test.

To evaluate the influence of the factors (as independent variables, *see below*) on the occurrence of back pain (as the dependent variable), multiple logistic regression was performed. Throughout the statistical analysis, the significance level was set at $P<0.05$.

Results

Patient enrolment began in January 1999 and ended in October 1999. Seventy-six women who were in their 8th or 9th month of pregnancy were studied (mean age 31.4 years, range: 20–41 years). The mean height of the women was 162 cm (SD 9.1 cm), the mean weight before pregnancy was 59.1 kg (SD 10.1 kg) and the mean weight increase during pregnancy was 12.6 kg (SD 4.4 kg).

In 38% of women, the current pregnancy was the first one. Sixty-two percent of the women had gone through a previous pregnancy: 18 women had given birth to one previous child, 8 women to two children, one woman to three children, and one woman to four children.

Twenty-six percent of the women were smokers (12% smoked fewer than ten cigarettes per day, while 4% smoked ten or more). Sixty-seven percent of women did not drink any alcohol at all, 28% drank alcohol sporadically, while 5% drank it habitually.

Before the pregnancy, 42% of women had suffered back pain sporadically and 7% had suffered it frequently; 16% of women had experienced sporadic sciatica before pregnancy, and 3% had experienced it frequently.

Concerning the last period of the pregnancy, the mean Roland score of the studied sample was 3.4 (SD 4.0). Thirty-one percent of women did not have any back pain symptoms (scored 0 on the Roland questionnaire), 40% scored from 1 to 4, 21% from 5 to 10, and 8% of the women scored more than 10 (Fig. 1). We excluded the re-
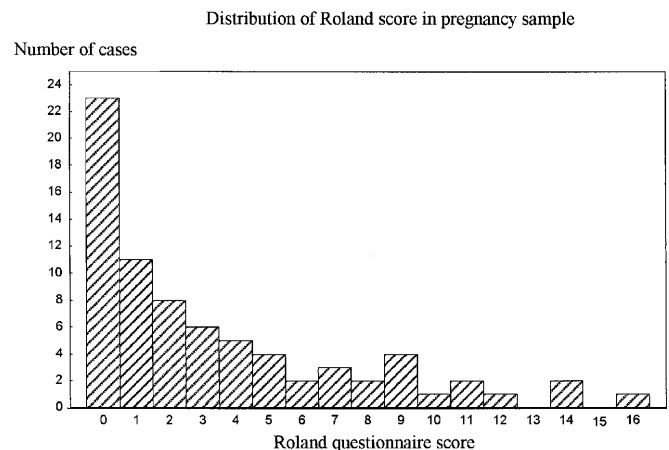
Fig. 1 Distribution of Roland score (a disease-specific questionnaire for back pain) in a sample of women during the last period of pregnancy
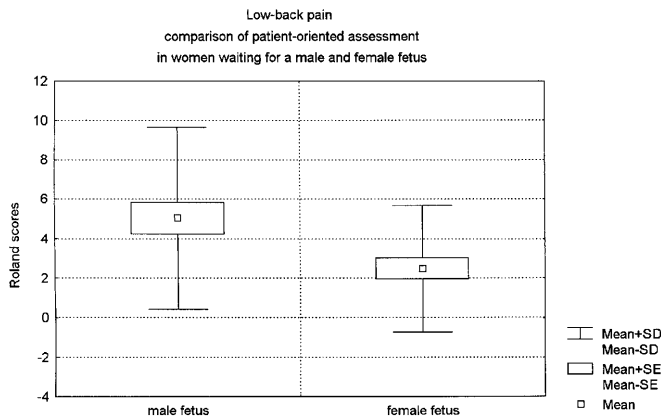
Fig. 2 Differences (*P*=0.02) in Roland score (a disease-specific questionnaire for back pain) between women with a male versus a female fetus

sults of one patient's Roland questionnaire, because it was not correctly filled in (more than one answer for each question).

Roland scores were positively related to history of back pain (*P*=0.0002, *r*=0.4) and sciatica (*P*=0.02, *r*=0.3) before the pregnancy. A significant correlation was observed between Roland picture and sex of the fetus (*P*=0.001, *r*=–0.4). Smoking habits also correlated with the Roland score (*P*=0.05, *r*=0.2). Correlations with all the other studied variables were not significant (none of the *P*-values were near 0.05).

Comparisons between women pregnant with a male child and women pregnant with a female child showed significant differences in Roland score (*P*=0.02, see Fig. 2). (Note that in 8 out of 76 cases, the sex of the fetus was undetermined.)

However, Roland score was not related to weight before pregnancy, increment of weight during pregnancy, age or being a housewife.

Predictive factors

To judge whether certain clinical data may predict the severity of low back symptoms (according to the patient-oriented evaluation), the following (dependent) variables were correlated with Roland score (as the independent variable): (1) age, (2) weight before pregnancy, (3) weight increment during pregnancy, (4) alcohol and (5) smoking behavior, (6) low-back pain and (7) sciatica before pregnancy, (8) previous pregnancy and (9) sex of the fetus. History of low-back pain (coded 0=none, 1=sporadic, 2=frequent) and male sex of the fetus (coded 1=male, 2=female) were related to high Roland scores (*P*=0.002, β 2.4 and *P*= 0.0007, β –2.3 respectively). The other variables were not significantly related to the Roland score.

Discussion

Back pain is a very common complaint during pregnancy. Many authors believe that about half of pregnant women suffer from it [11, 29]. Some studies have focused on assessing the frequency of back pain in pregnancy. An epidemiological study conducted in Norway [4] on 5400 women after delivery, for instance, showed that 21% of primipara and 31% of multipara women had experienced back pain during pregnancy; while a study of 449 pregnant women who were consecutively referred for antenatal ultrasonographic examination showed that 54.8% of women reported back pain during pregnancy [17].

Several studies of pregnant women have been conducted to assess the clinical picture [7, 28, 29], therapies [15, 33] and follow-up [3, 21, 22]. Only few of these, however, assessed the severity of the disease through validated patient-oriented tools.

We performed a study on pregnant women using the Roland questionnaire [26]. Our results are not comparable to previously reported data, because of the study design (our study quantifies the symptoms through a patient-oriented tool, it did not focus on assessing the occurrence of back pain, etc.).

According to the Roland questionnaire, about two-thirds of our sample have back pain symptoms, but most often back pain causes only low-grade disability (Fig. 1).

With regard to the predictive factor, in accordance with previous studies [4, 10, 19, 22], the present study found history of back pain and sciatica before the pregnancy to be related to the back pain symptoms.

Unexpectedly, our results showed that male sex of the fetus seems to be a predictive factor for occurrence of back pain symptoms during pregnancy. This result had no apparent explanation, and it cannot be ruled out that the association is a statistical artefact (a follow-up study is in progress, which will provide further data on this issue, for example birth-weight). In contrast, Roland score was not related to weight before pregnancy, not to the increment of weight during pregnancy. This latter result is in accordance with studies which show that, like non-pregnant women, pregnant women who are moderately overweight are not at greater risk of back pain [18, 30, 31]. Concerning age as a risk factor for back pain, contrasting opinions have been reported. Mantle et al. [13] found that the prevalence of back pain increases with age, while Östgaard et al. [18] found a negative correlation between age and back pain.

Previous studies, have shown that smoking habits are positively related (although usually with a weak significance) to the occurrence of back pain in the general population [6, 8, 12]. Similarly, our study showed a significant relationship between smoking and back pain symptoms.

Conclusions

Evaluation of the patient's perspective made it possible to identify predictive factors for occurrence of back pain, thereby furnishing information that may be helpful for the clinical approach to pregnancy. The follow-up study that is in progress will probably provide more useful information for an evidence-based modification of the clinical approach.

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