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Back pain in pregnancy: 1-year follow-up of untreated cases

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Abstract Back Pain (BP) is one of the most frequent symptoms during the last period of pregnancy, and high incidence has been described in several studies. Until now no wide, multicenter and prospective clinical studies on the natural course of BP after pregnancy have been available. We performed a multicenter follow-up study in a sample of pregnant women using the Italian validated version of the Roland questionnaire to assess the evolution of BP after pregnancy and identify prognostic factors. Each center had to re-evaluate at least 75% of the initially enrolled women, with latency of 1 year after delivery. At the follow-up, we acquired substantial clinical data concerning the post-delivery period. The evaluation of symptom evolution was based on the Roland questionnaire. At follow-up, 53% of re-evaluated women had

no BP symptoms. Moreover, there was a significant improvement of patient-oriented assessment in women who suffered BP after delivery. With regard to the predictive factors, the presence of BP before pregnancy implied a 3.1-fold higher probability of improvement after delivery. In conclusion, women without history of BP before pregnancy and who complain of these symptoms during pregnancy require greater attention, because they have a lower possibility for improvement. Conversely, in women with a history of BP, pregnancy represents a transient period of worsening symptoms, probably due to the temporary para-physiological mechanical condition.

Keywords Patient-oriented assessment · Roland questionnaire · Back pain · Pregnancy

Introduction

Back pain (BP) is one of the most frequent symptoms to appear during the last period of pregnancy and a high incidence has been described in several studies [2, 6, 7, 9, 14, 17]. Since 1984 modern studies of BP also need to include patient-oriented assessment [23]. Self-administered questionnaires are the most common instruments to assess patient perspective in evaluating the clinical picture, and the usefulness of these instruments [20, 21] is widely accepted. BP during pregnancy has been quantitatively evaluated in some recent papers, but only a few studies analyzed the symptoms from a qualitative-quantitative point of view, using a validated patient-oriented tool [16, 25].

During 2001, we performed a study to assess the incidence and severity of BP during the last period of pregnancy, through a modern and comprehensive assessment of the patient's perspective [18]. That study demonstrated that the incidence of BP in pregnancy is high (about two-thirds of our sample have BP symptoms), but most often BP causes only low-grade disability.

Until now no multicenter and prospective clinical studies on the natural course of BP after pregnancy have been available (multicenter studies are commonly accepted as providing a more representative sample). We performed the follow-up of the previous studied sample; consequently, we acquired data from a multicenter sample. We used a validated patient-oriented measurement, the Roland questionnaire, to obtain more comprehensive and consistent

Table 1 Characteristics at baseline of re-evaluated sample and sample not re-evaluated

	Total sample	Sample not re-evaluated	Re-evaluated sample	<i>P</i> value (re-evaluated vs not re-evaluated)
Number of patients	76	19	57	
Patients with BP at baseline	68%	58%	72%	NS
Mean age at baseline (range)	31.4 (20–41)	29.6 (20–41)	32.0 (21–40)	NS
Patients with history of BP before pregnancy	50%	37%	54%	NS
Patients with history of sciatica before pregnancy	18%	21%	17%	NS
Mean Roland (SD)	3.4 (4.0)	2.6 (2.8)	3.7 (4.3)	NS

data for severity of symptoms and functional impairment. The aim of our study was to evaluate the evolution of BP after pregnancy and identify the prognostic factors.

Materials and methods

All centers adhered strictly to the protocol summarized here. The collaboration was performed according to the recently proposed guidelines for multicenter collaboration and clinical research in neurology [1, 10]. Each patient was exhaustively informed about BP and its relationship with pregnancy. They were also informed about the study. All patients enrolled in the study gave written informed consent. Six of the seven centers that participated in the first study adhered to the follow-up study of the same sample (mean age at follow-up, 32.4 years, range, 21–42 years).

Data collection at initial evaluation

Each center had to enroll at least ten consecutive women who were in their 8th and 9th months of pregnancy and were monitored by a gynecologist, Gynecologists, orthopedists and neurologists acquired the following data by asking patients to fill in a form: height, weight before pregnancy, whether the patient is a housewife, use of alcohol and tobacco, previous pregnancy, and BP before pregnancy. Moreover, the following data concerning the current pregnancy were acquired: occurrence of edema (evaluated through fovea at tibia after digital pressure, coded as: absent, mild or severe), BP symptoms, ultrasonography weight and sex of the fetus [18].

Patient-oriented data: Roland questionnaire

We used the Italian validated version of the disease-specific Roland questionnaire to assess BP [22, 23]. The questionnaire consists of 24 items scored numerically (range: 0=no disability, 24=severe disability), covering the severity of symptoms and functional impairment. In accordance with previously described methodologies [19, 26], a nurse in the waiting room gave the questionnaire to patients before the medical evaluation.

Follow-up

Each center had to re-evaluate at least 75% of the initially enrolled women, with latency between 12 and 15 months from the first evaluation (therefore about 1 year after delivery). At the follow-up we acquired data on delivery, lactation, weight of the child at birth, sex of the child, the woman's weight before pregnancy, her total weight increase during pregnancy, presence of BP after delivery,

presence of BP and sciatica before pregnancy, and alcohol and smoking behavior. The evaluation of symptom evolution was based on the Roland questionnaire. No women who had BP at first evaluation were treated for BP.

Predictive factors

To judge whether some clinical data may predict evolution of lower back (LB) symptoms (according to the patient-oriented evaluation), the following factors were taken:

- Age
- Weight increment during pregnancy
- BP before pregnancy (coded 0=no LB; 1=sporadic, 2=frequent)
- Sex of fetus

These factors were related, as independent variables, to Roland score changes from baseline (as dependent variables).

Statistical analysis

Statistical analysis was performed by using the STAT-SOFT package (Statistica 4.5, Tulsa, OK, USA). Because ordinal or nominal scales (such as the Roland questionnaire) were used for measurement, non-parametric tests were also used. Group comparisons were assessed using the Wilcoxon matched-pairs test, the Mann-Whitney U test and the chi-square test.

To correlate the evolution of BP according to independent variables, we calculated the change from baseline of Roland score (gradient of evolution = initial score – follow-up score). To determine which independent variables could predict the evolution gradient, a multiple, linear-stepwise-regression analysis was applied. Throughout the statistical analysis, the significance level was set at 0.05.

Results

Table 1 summarizes characteristics at baseline of the re-evaluated sample and the sample not re-evaluated. Fifty-seven of the initially enrolled women (76) were re-evaluated. Comparison of clinical and patient-oriented data between the re-evaluated sample and the drop-out sample did not show any statistical differences.

Forty-one out of the 57 re-evaluated women had BP at initial evaluation. At follow up, 21 (51.2%) of these 41 presented BP. Six without BP at first evaluation complained of BP at follow-up. Hence, at follow up, 27 women presented BP.

Fig. 1 Roland score groups at initial evaluation and follow-up in women with back pain at baseline

The mean Roland score of the re-evaluated sample was 3.7 (SD 4.3) at baseline and 1.6 (SD 2.4) at follow-up. Statistical comparison showed a significant improvement ($p=0.002$) of patient-oriented assessment. In this sample, at follow-up 53% had no BP symptoms (score of 0 on the Roland questionnaire), 37% scored from 1 to 4, 9% scored from 5 to 10 and 1% scored >10.

In Fig. 1, the percentages of women complaining of BP at initial evaluation are summarized in the various Roland-score groups at initial evaluation and follow-up.

In the multiple linear-regression analysis, BP before pregnancy was related to a higher Roland-score change from baseline ($p=0.003$, $\beta: 3.1$), which indicates a higher possibility of improvement; β value indicates that the presence of BP before pregnancy implies a 3.1-fold higher probability of improvement after delivery. The other variables were not significantly related to Roland score.

Comparison of Roland score at follow-up between women with and without BP before pregnancy did not show significant differences. As expected (considering multiple regression results), comparison of Roland-score changes from baseline showed higher improvement in women with a history of BP before pregnancy ($p<0.02$).

Discussion

BP is a very common disease during pregnancy, with many authors estimating that about half of pregnant women suffer it [8, 25]. Several studies have assessed the frequency of the disease [4, 13], the clinical picture [5, 24, 25], therapies [11, 27] and follow-up [3, 16, 17]. However, only a few have assessed its severity through validated patient-oriented tools. Moreover, no studies have assessed the post-delivery evolution through a validated patient-oriented questionnaire.

According to Östgaard et al. [17], BP during pregnancy regressed spontaneously soon after delivery, and it improved later than 6 months post delivery for just a few women. BP was evaluated by a visual analogic score. Noren L et al. [12] found that 3 years after pregnancy, 20% of all studied women with BP during pregnancy had pain.

In another study, Östgaard et al. [16] differentiated between posterior pelvic pain and BP, concluding that higher pain intensity in pregnancy indicated a bad prognosis.

We recently performed a multicenter study in order to assess the severity of BP during the last period of pregnancy [18]. In this study, according to the Roland questionnaire, about two-thirds of our sample had BP symptoms, but most often BP caused only low-grade disability. With regard to the predictive factors, as previously observed [4, 7, 15, 17], a history of BP and sciatica before pregnancy were related to BP symptoms in pregnancy. Unexpectedly, male sex of the fetus seemed to be a predictive factor for the disease.

After the first study we performed a follow-up through the same protocol (including patient-oriented data). The results of our follow-up study are not easily comparable to the previous reported studies, due to a different design. Our study quantifies the symptoms and post-delivery evolution through a patient-oriented tool. Our patients were evaluated 1 year after pregnancy, and we did not differentiate between posterior pelvic pain and BP.

In our re-evaluated sample, 1 year after delivery only 49% of women with BP during pregnancy said their BP symptoms had disappeared. However, the symptom severity was lower than during pregnancy. With regard to the predictive factors, history of BP is related to a higher possibility of improvement.

To explain why history of BP is a positive prognostic factor, we hypothesize that in cases where BP has an intermittent-remittent behavior, pregnancy represents a period of worsening symptoms due to a transient, abnormal mechanical condition. When this condition ends, BP improves. Note that in our previous study, a history of BP was a predictive factor for BP in pregnancy. Our hypothesis is indirectly supported by results reported by Brynhildsen J et al. [3]. The authors concluded that women with severe BP during pregnancy had an extremely high risk for experiencing a new episode of severe BP during another pregnancy and when not pregnant. Furthermore, Östgaard HC et al. [17] observed that frequency of BP attacks at 6 years after pregnancy correlated with frequency of attacks during pregnancy.

Conclusion

In conclusion, our study showed that 1 year after delivery, around half of women still complained of BP symptoms, although symptoms improved significantly. Moreover, women without a history of BP before pregnancy and who complain of these symptoms during pregnancy should get greater attention, because they have a lower likelihood of improving.

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