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[Survey] ◂ Previous Article | Table of Contents | Next Article ▸

Understanding Peripartum Pelvic Pain: Implications of a Patient Survey

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Abstract

Study Design.: An analysis was made of the self-reported medical histories of patients with peripartum pelvic pain.

Objectives.: To compile an inventory of the disabilities of patients with peripartum pelvic pain, analyze factors associated with the risk for development of the disease, and to formulate a hypothesis on pathogenesis and specific preventive and therapeutic measures.

Summary of Background Data.: Pregnancy is an important risk factor for development of chronic low back pain. Understanding the pathogenesis of pelvic and low back pain during pregnancy and delivery could be useful in understanding and managing nonspecific low back pain.

Methods.: By means of a questionnaire, background data were collected among patients of the Dutch Association for Patients With Pelvic Complaints in Relation to Symphysiolysis. Results were compared with the general population. Subgroups were compared with each other.

Results.: Peripartum pelvic pain seriously interferes with many activities of daily living such us standing, walking, sitting, and all other activities in which the pelvis is involved. Most patients experience a relapse around menstruation and during a subsequent pregnancy. Occurrence of peripartum pelvic pain was associated with twin pregnancy, first pregnancy, higher age at first pregnancy, larger weight of the baby, forceps or vacuum extraction, fundus expression, and a flexed position of the woman during childbirth; a negative association was observed with cesarean section.

Conclusions.: It is hypothesized that peripartum pelvic pain is caused by strain of ligaments in the pelvis and lower spine resulting from a combination of damage to ligaments (recently or in the past), hormonal effects, muscle weakness, and the weight of the fetus.

Pregnancy and childbirth elicit important psychosocial and physical changes. Pain in the pelvic or low back region is a possible complication. A clear diagnosis can be made in only a small percentage of these patients (*e.g.*, radicular compression, meralgia). In most, the problems cannot be defined by objective methods, frequently resulting in suggestive and nonsense lables such us “pregnancy sciatica” and “pelvic insufficiency.” When objective signs are found, such as separation of the public bones or enlarged mobility of the pelvic girdle, the relation with symptoms remains speculative. The authors prefer to use the descriptive term “peripartum pelvic pain” (PPPP), defined as pain in the pelvic region (with or without irradiation)

Outline

that started during pregnancy or within the first 3 weeks after delivery and for which no clear diagnosis is available to explain the symptoms.

The reported period-prevalence of pelvic and back pain during pregnancy ranges between 48% and 56%.[3,11,21,25] The pain is considered severe in 9-15% of cases.[3,21] In a longitudinal study, pain at the time of delivery was reported by 67% of the women and by 37% 18 months postpartum, whereas 22% had ongoing back pain before pregnancy.[24] In retrospective studies among young and middle-aged women with chronic low back pain, 10-28% stated that their first episode of back pain occurred during a pregnancy.[4,36]

Pelvic pain is prominent around the sacroiliac joints and the symphysis. It frequently extends to other parts of the pelvis, the upper legs, and, exceptionally, the lower legs.[11,25] Peripartum pelvic pain is influenced by a variety of postures and movements.[1,10,21] Many patients show a characteristic waddling gait. Except for heavy physical loading and previous low back pain, no predisposing factors are known.[3,25]

The idea that an increased lumbar lordosis during pregnancy is responsible for PPPP is persistent [10,11,16,18]; however, in most women, lordosis is smaller during pregnancy than postpartum.[9,33] It is still tempting to speculate that complaints arising during pregnancy are, at least in part, caused by the weight of the fetus and uterus, altering the load on muscles, tendons, and joints. Muscle weakness and insufficiency of pelvic ligaments could contribute to overload and pain.[11]

An additional explanation could be increased laxity of ligaments because of hormones.[32] MacLennan et al found a higher serum relaxin level in pregnant women with PPPP than in control subjects.[20] Mobility of the peripheral joints measured at the finger joints increases during pregnancy; it reaches higher levels in multiparous women than during the first pregnancy.[7,26] Increased mobility and widening of the pubic symphysis were well documented before the hazards of irradiation were realized.[1,14,17,19,37] Anatomic studies in former days, when mortality during pregnancy and labor was not exceptional, show increased mobility of the sacroiliac joints; often an increased amount of articular fluid was found.[2,5,29] Such an increase influences the stability of the sacroiliac joints because in these joints friction is important for stability.[39,40]

If complaints start immediately after a vaginal delivery, the obvious assumption is that PPPP is caused by mechanical forces acting on the pelvic ring. On computed tomography scan performed within 24 hours of an uncomplicated vaginal delivery, widening of the pubic symphysis was present in 42%, and intra-articular gas was seen in the symphysis in 28% and in the sacroiliac joints in 42% of the women. This implies that the joints underwent stretching.[13] Mechanical forces may also cause bleeding or synovial effusion into the joints.[12]

Recommendations to treat PPPP vary widely: rest, the use of a pelvic belt, local injections in the symphysis, and, for severe cases, symphysiodesis with or without additional fusion of one or both sacroiliac joints.[1,3,23,28,31,38] The results of muscle and postural training and ergonomic advice are highly divergent.[9,22,28]

The authors conclude that no consensus exists on the pathogenesis, management, and prevention of PPPP.

A prospective study on the efficacy of therapy and prevention would be useful, but first, several questions have to be answered. The current study focuses on the following:

1. The kinds and severity of complaints of patients with PPPP;
2. Factors associated with the risk for development of PPPP; and
3. Therapeutic measures.

Clarification of these points will assist in formulating a hypothesis on the pathogenesis of PPPP, and specific preventive and therapeutic measures.

Back to Top

[black small square] Materials and Methods

The existence of a Dutch “Association for Patients With Pelvic Complaints in Relation to Symphysiolysis” offered the opportunity to contact a large number of motivated patients with PPPP. Most patients contacted the Patients' Association after reading an announcement in the magazine *Today's Parents*. In the announcement, the occurrence of pain in the symphysis region was emphasized. The magazine is predominantly read by young mothers; most of them are well educated and white.

A questionnaire was sent to all patients who contacted the Patients' Association in the first 9 months after its foundation in 1990 (N = 622). The questions focused on the following themes:

1. Localization of the pain (this could be indicated by means of a drawing; Figure 1);

Figure 1

2. Disabilities in relation to PPPP;
3. Possible influence of menstruation and a new pregnancy on severity of the pain;
4. The time of onset of pain in relation to pregnancy and delivery, and the duration of PPPP;
5. The age and height at the onset of problems, the weight before and after pregnancy, and in which pregnancy the problems occurred'
6. The posture of the woman during delivery, the weight of the baby (babies), how the delivery was experienced, and whether delivery was assisted by mechanical means (forceps, vacuum extractor, external compression on the abdomen) or cesarean section; and
7. Therapeutic measures.

Patients were included if pain was felt in the symphysis region, the groin, the greater trochanter, the region of the sacroiliac joints, or the lateral parts of the buttock (areas shaded in Figure 1). excluded were patients with pain irradiating below the knee and patients in whom pain started before pregnancy or later than 3 weeks after childbirth.

Normally distributed data are presented as means ± standard deviation (SD). For skewed distributions, the median and range are presented. Unless another method is mentioned, frequencies are compared using the chi-square test. $P < 0.05$ is considered significant.

Back to Top

[black small square] Results

Of 622 patients, 518 responded (83%). After applying the inclusion and exclusion criteria, 394 women remained. Most of them (96.7%) were born in The Netherlands.

Figure 1 summarizes the distribution of pain for all women. The number of regions indicated by the respondents ranged between 1 and 28, with a median of 7. It is noteworthy that the pubic region was indicated by 77% of the women. Other regions frequently indicated as painful were the right and left groin (53% and 52%, respectively), the region of the posterior superior iliac spines (42% and 41%, respectively), and the coccyx (33%). Seventy-two women (18.2%) had pain exclusively at the anterior side of the body; 58 (15%) experienced pain in the median lumbar region (Figure 1).

Activities of daily living that provoked pain are shown in Table 1. Of the 15 listed activities, 14 were painful in more than 45% of the women. Standing for 30 minutes was painful in 90%. It is noteworthy that 68% experienced pain during sexual intercourse. Only 8% of the women claimed pain when lying in bed for 30 minutes.

Table 1

Apart from the influence of activities, pain was also influenced by menstruation and by new pregnancies. Seventy-two percent of the women claimed to have more pain around menstruation. Of the 394 women, 217 had one or more subsequent pregnancies; 85% of them experienced a relapse of PPPP during a new pregnancy.

Of the total group, 262 women (66.5%) claimed that pain started during pregnancy. Pain was perceived as early as during the first 2 months in 12 women. The risk for development of PPPP was highest from the third to the seventh month (in 84.3% of the cases; Figure 2). At the time of the inquiry, 88 women (22.2%) were free of pain. Their problems lasted between 2 and 72 months, with a median of 6 months. In the subgroup with pain exclusively on the anterior side of the body, the percentage free from pain was higher (53.7%; $P = 0.000$) than in the total group, and in the subgroup with (a part of their) pain in the median lumbar region, it was lower (8.9%; $P < 0.009$). These subgroups did not differ significantly from the rest of the group with respect to the other variables. In the women with ongoing pain (N = 306), the complaints lasted between 2 months and 27 years, with a median of 2 years.

Figure 2

The complaints started in 89.1% of the patients in the period 1985-1991 (median, 1989). In the following, possible risk factors are compared with data on the general Dutch population in the year 1989 and, if not available, in 1988.

The age at which PPPP developed ranged between 19 and 40 years; the average was 28.6 ± 3.7 years in a normal distribution. The average age of the primiparous women was 27.9 ± 3.6 years, 0.5 years older than expected for the Dutch population in 1989 (two-tailed *t* test $P < 0.05$).8 The weight increase during pregnancy ranged between 2 and 30 kg, with a median of 12 kg. The average height of the women was 168.9 ± 6.5 cm. The mean body mass before pregnancy was 65.9 ± 10.5 kg. These values and their distributions are not different from those of women of the same age in the general Dutch population.35

The average birth weight of 3.555 ± 0.525 kg is significantly higher than in the general Dutch population ($P = 0.000$; Table 2).15 In 13 women (3.3%), this concerned a twin pregnancy. When compared with the frequency of twins in the Dutch population (1.4%), this percentage is significantly higher ($P = 0.001$).35


Table 2

In the subgroup in which pain started during childbirth or during the subsequent 3 weeks (subgroup “delivery”; N = 132), a small percentage of cesarean sections was found and a high percentage of deliveries assisted by vacuum extraction, forceps, or by manual pressure on the fundus of the uterus (“fundus expression”). The difference in the distribution is significant ($P = 0.000$) when compared with the patients in which pain started during pregnancy (subgroup “pregnancy”) and with the Dutch population (Table 3).


Table 3

In the subgroup “delivery,” an easy delivery was reported by 25 women. Table 4 shows a significant difference in the distribution of delivery positions between this group and the women with an easy delivery in subgroup “pregnancy” ($P = 0.000$). The former gave birth less frequently in a half-sitting position with the feet placed on the bed and more frequently in a flexed position (with or without stirrups).


Table 4

In subgroup “pregnancy,” the percentage of primipara was 58.8%, and in the subgroup “delivery” 81.8%. These values are significantly higher than in all women who gave birth in 1988 in The Netherlands (44.6%).15 (In both subgroups, binomial test two-tailed $P = 0.000$.)

Between subgroups “pregnancy” and “delivery,” there were no differences regarding age, height, and weight of the women, nor regarding the increase in weight during pregnancy, the weight of the baby, the kind, severity, and duration of the complaints, the effectiveness of therapy, and the percentage of relapses around menstruation and a subsequent pregnancy.

Many patients had heard one or more descriptive or suggestive terms as the “explanation” for their disease. In 277 cases (69.9%), the complaints were labeled as symphysiolysis. In 12 women, sciatica or a disc protrusion were mentioned as possible causes for the pain. Sixty-eight percent of the women visited at least one medical specialist, in most cases a gynecologist or an orthopedic surgeon. Fifteen women (3.8%) consulted a psychiatrist or psychologist.

Table 5 summarizes the reported effects of therapy. The use of a pelvic belt relieved the pain in about half of the pregnant patients and in about two thirds of the patients after delivery. Of the 55 patients who used the belt during and after pregnancy, 17 had better results after pregnancy, and only two worse. About 65% of the patients treated with bed rest combined with exercise felt better or cured *versus* 40% treated exclusively with bed rest and 35% exclusively with exercises. Almost 70% of the patients who used medication or massage experienced relief of pain; however, the effect was temporary in a remarkably large percentage. Aggravation of pain after treatment occurred especially after exercises (without bed rest) and manual therapy (22.8% and 18.9%, respectively). Less than 5% of the patients were treated with surgery or local injections. These numbers are too small to permit conclusions to be drawn.


Table 5

Back to Top

[black small square] Discussion

It is questionable whether the inclusion and exclusion criteria are specific enough to exclude patients with specific physical or mental diseases. However, of the women of the Patients' Association who we examined (more than 100 each year), PPPP is confirmed by exclusion of other known syndromes in more than 95%.

The accuracy of self-reported events in a retrospective study is subject to recall bias. This holds especially for the moment pain started and the use of fundus expression.

Comparison with other reports is difficult. Because of the authors' selection, it is expected that the percentage of patients with severe handicaps and poor

therapeutic results will be high. Moreover, a substantial percentage of the patients had no pain on the posterior side of the body; these patients are mainly excluded in other reports.3,10,11,21,25,28,36

Back to Top

Localization of Peripartum Pelvic Pain

The percentage of patients in the present study who indicate pain in the median lumbar region (Figure 1) is very small. Ostgaard et al 28 differentiated "low back pain" during pregnancy from "posterior pelvic pain;" the outcome in the first group was favoured by a preventive program with muscle exercises and ergonomic advice, but not in the second. In the present patient population, the prognosis was worse in those with median lumbar pain. The high percentage of patients who indicated pain in the area of the posterior superior iliac spines warrants attention. In most patients, such pain can be elicited by palpation of the dorsal sacroiliac ligaments. This supports the idea that PPPP may be caused by ligament strain.

One third of the patients with PPPP experienced pain in the coccyx region (33%). To consider coccygodynia as a part of PPPP could shed new light on the understanding of this problem.

Back to Top

Kinds of Complaints

As might be expected, PPPP interfered with most activities of daily living (Table 1). The high frequency of the complaints is alarming: over 80% of the respondents reported increased pelvic pain during standing and walking. These disabilities could interfere in running the household, nurturing the baby, performing a job, and participating in sports. Lack of understanding on the part of relatives and therapists could create serious psychosocial problems.

Back to Top

Factors Associated With Peripartum Pelvic Pain

It is interesting that 72% of the patients experienced a relapse around menstruation and 85% during a subsequent pregnancy. Whether the first symptoms of PPPP began during pregnancy or around delivery did not make any difference. These frequent relapses are possibly the result of a detrimental hormonal influence after previous pelvic damage.

The normal height and weight of women with PPPP and normal weight gain during pregnancy agree with the outcomes of earlier studies.10,21,30 The relatively old age of the primiparous women in this study could provide an explanation for the impression that the incidence of PPPP has increased during the past decades.28 After all, the age of primiparous women has increased dramatically (in The Netherlands with about 2 months each year 8). However, the difference is small (0.5 year) and could be caused by selection bias. Moreover, in other studies no association between age and PPPP is observed.22,27

A relatively high weight of the babies was also found in a study among patients of The Norwegian Patients' Association but not in population studies on back pain and pregnancy.10,21,27,30 Selection of severe cases in patients' associations could explain this controversy.

Peripartum pelvic pain developing around childbirth is associated with an increase in assisted vaginal deliveries. Assisted deliveries mostly reflect mechanical problems during childbirth. The percentage of cesarean sections is remarkably low. The possibility cannot be ignored that a better knowledge of mechanical problems during the second stage of childbirth could prevent PPPP in some cases. A high percentage of forceps deliveries is also observed in the patients of the Norwegian Patients' Association.30 The normal percentage of cesarean sections in that study could be explained by the fact that no "delivery" subgroup was analyzed.

The high frequency of delivery positions with a bent spine in the subgroup with complaints occurring despite an easy childbirth is remarkable. Because specific data on the general population are lacking, caution is needed. However, a flexed position during delivery might enhance the risk for PPPP.

The high incidence of PPPP around first pregnancy and delivery is striking. Combined with the high percentage of relapses during new pregnancies, it is expected that the prevalence of PPPP increases with parity. This is in accordance with observations in many other studies 21,25,36; it is not clear, however, why no association between parity and PPPP is found in two studies.3,10 The authors have the impression that PPPP starts during first delivery in almost all severe cases. For patients who state that pain started during pregnancy, it may result from minor

problems that worsen during childbirth. For patients who state that pain started during the second pregnancy, this pregnancy was very often preceded by a difficult delivery.

Back to Top

Therapeutic Measures

A pelvic belt appears to be an effective expedient in the treatment of PPPP. A belt is less effective during pregnancy than after delivery. In the authors' experience, this holds for all therapeutic measures. In some patients, application of a belt led to increased pain-in the authors' experience-mostly within 15 minutes. Logically, the belt should be removed.

Bed rest frequently is prescribed. Nine percent of the present study group claimed to have more pain after a period of bed rest. The authors' experience is that rigorous bed rest is beneficial when prescribed for a short period (1 or 2 weeks). It is possible that muscle weakness is a long-term side effect of rest. The theoretic influence of muscle force on stability of the pelvis is reported in the literature.34,38

Massage and medication are safe measures and give relief of pain in many patients, although this is only temporary in most cases. The risk for deterioration is relatively high in manual therapy and exercises.

Back to Top

Causes of Peripartum Pelvic Pain

There is little evidence to sustain the view that the increased load resulting from the weight of the uterus and fetus is the prime cause of PPPP. Pain sometimes starts in the first months of pregnancy, and PPPP develops in relatively few women during the last 2 months (Figure 2). In earlier reports, the same pattern is found.21,22,30 It is striking that the monthly incidence of PPPP during pregnancy shown in the present study roughly parallels the increase of movement of the sacroiliac joints during pregnancy observed in an anatomic study and in radiographic studies.1,6,14,37 The weight of uterus and embryo early in pregnancy can hardly influence the posture of the woman. In these women, change in hormonal status could play a more important role. Perimenstrual increase of pain in 74% suggests the importance of hormones. Because 58.8% of the women who state that PPPP started during pregnancy are primiparous, 41.2% are multiparous and obviously had no problems during a previous pregnancy. In those cases, it seems that susceptibility to hormones is changed by a previous pregnancy or childbirth. It might be that a damaged pelvis is more sensitive to the influence of hormones.

A beneficial influence of a pelvic belt is frequently experienced, supporting the notion that PPPP results from strain of pelvic ligaments. The authors hypothesize that PPPP is caused by strain of the ligaments in the pelvis and lower parts of the spine. Overload results from a combination of factors, among which damage to pelvic ligaments (recently or in the past), specific hormonal effects, muscle weakness, and the increased weight of fetus and uterus are particularly important.

Based on the current study, a prospective study is being designed to analyze the predictive factors for successful management and prevention of PPPP.

Back to Top

[black small square] Conclusions

Peripartum pelvic pain interferes with most activities of daily living. The development and course of PPPP pear to be influnced by hormonal and mechanical factors. For most patients, the best results were obtained by bed rest combined with exercises. The use of a pelvic belt was especially effective after pregnancy. In general, the beneficial effect of medication or massage was temporary.

Back to Top

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Back to Top

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Key words: birth weight; low back pain; pregnancy; public symphysis; sacroiliac joint

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IMAGE GALLERY

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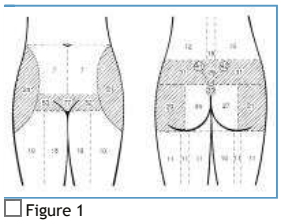
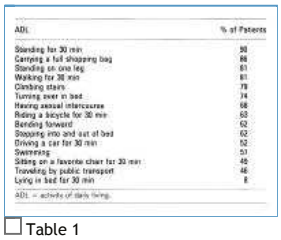


Figure 1



ADL	% of Patients
Standing for 30 min	90
Carrying a full shopping bag	86
Standing on one leg	81
Walking for 30 min	81
Climbing stairs	79
Turning over in bed	74
Having sexual intercourse	68
Riding a bicycle for 30 min	63
Bending forward	62
Stepping into and out of bed	62
Driving a car for 30 min	52
Swimming	51
Sitting on a favorite chair for 30 min	49
Traveling by public transport	46
Lying in bed for 30 min	8

ADL = activity of daily living.

Table 1

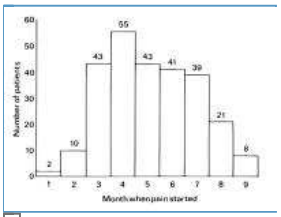
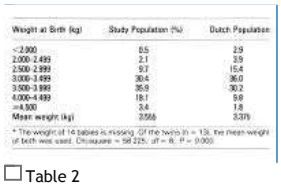


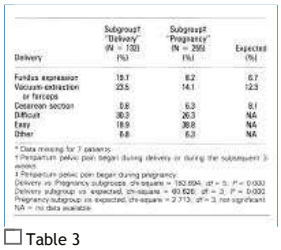
Figure 2



Weight at Birth (kg)	Study Population (%)	Dutch Population
<2.000	0.5	2.9
2.000-2.499	2.1	3.9
2.500-2.999	9.7	15.4
3.000-3.499	30.4	36.0
3.500-3.999	36.9	30.2
4.000-4.499	18.1	9.8
≥4.500	3.4	1.8
Mean weight (kg)	3.566	3.375

* The weight of 14 babies is missing. Of the twins (n = 13), the mean weight of both was used. Chi-square = 98.225; df = 8; P = 0.000.

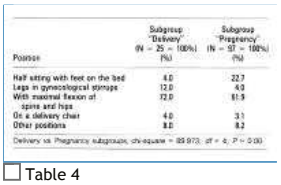
Table 2



Delivery	Subgroup† "Delivery" (N = 120) (%)	Subgroup‡ "Pregnancy" (N = 266) (%)	Expected (%)
Fundus expression	18.7	8.2	6.7
Vacuum-extraction or forceps	23.5	14.1	12.3
Cesarean section	0.8	6.3	8.1
Difficult	30.3	26.3	NA
Easy	18.9	38.8	NA
Other	8.8	6.2	NA

* Data missing for 7 patients.
† Peripartum pelvic pain began during delivery or during the subsequent 3 weeks.
‡ Peripartum pelvic pain began during pregnancy.
Delivery vs. Pregnancy subgroups, chi-square = 182.694; df = 5; P = 0.000.
Delivery subgroup vs. expected, chi-square = 60.626; df = 3; P = 0.000.
Pregnancy subgroup vs. expected, chi-square = 2.713; df = 3; not significant.
NA = no data available.

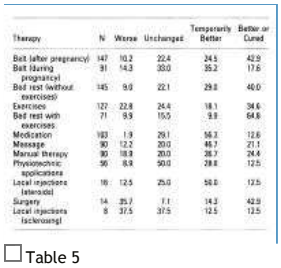
Table 3



Position	Subgroup "Delivery" (N = 25 = 100%) (%)	Subgroup "Pregnancy" (N = 97 = 100%) (%)
Half sitting with feet on the bed	4.0	22.7
Legs in gynecological stirrups	12.0	4.0
With maximal flexion of spine and hips	72.0	61.9
On a delivery chair	4.0	3.1
Other positions	8.0	8.2

Delivery vs. Pregnancy subgroups, chi-square = 89.973; df = 4; P = 0.00

Table 4



Therapy	N	Worse	Unchanged	Temporarily Better	Better or Cured
Belt (after pregnancy)	147	10.2	22.4	24.5	42.9
Belt (during pregnancy)	91	14.3	33.0	35.2	17.6
Bed rest (without exercises)	145	9.0	22.1	29.0	40.0
Exercises	127	22.8	24.4	18.1	34.6
Bed rest with exercises	71	9.9	15.5	9.9	64.8
Medication	103	1.9	29.1	56.3	12.6
Massage	90	12.2	20.0	46.7	21.1
Manual therapy	90	18.9	20.0	36.7	24.4
Physiotechnic applications	56	8.9	50.0	28.8	12.5
Local injections (steroids)	16	12.5	25.0	50.0	12.5
Surgery	14	35.7	7.1	14.3	42.9
Local injections (sclerosing)	8	37.5	37.5	12.5	12.5

Table 5

Back to Top

◂ Previous Article | Table of Contents | Next Article ▸