

Midwives and Gynecologists: Knowledge about Sterile Water Injections for Pain Relief in Labor

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■ ABSTRACT:

Presently, there is great interest in nonpharmacologic methods of pain relief during labor. The aim of this study was to determine whether gynecologists and midwives are aware of the use of sterile water injections for pain relief during childbirth, whether they use this pain relief method, and if not, would they do so in the future. We designed a quantitative, observational, descriptive, prospective and transversal study. Study participants were recruited from the 16th Health Department of Alicante, Spain. The data collection method used was a questionnaire of self-realization. The most relevant results indicate that those with less working experience (8.06 ± 6.82 years) used the technique most often compared with the group with more working experience (16.92 ± 11.90 years; $p = .04$). The results determined that women have more knowledge about the technique (79.3%), whereas only 33.3% of men are aware of it ($p = .02$). The results of this study showed a lack of knowledge regarding this technique, as well as educational interest in the fact that women have more knowledge than men. Increased use was observed in younger, less experienced professionals.

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BACKGROUND

In today's world, we expect to live without pain, which is why we consume thousands of painkillers, tranquilizers, and other methods of pain relief annually. However, labor and delivery must be recognized as a physiologic process of women's reproductive life and not as a disease.

Despite recent advances in public hospitals to establish epidural anesthesia services, at the Hospital Marina Baixa (Alicante, Spain), this service is only available from 8 a.m. to 7 p.m. Use of this service is restricted to women in labor who

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are present during that timeframe; have previously attended a lecture regarding what an epidural is, how it is performed, the risks associated with it, as well as other issues; and have signed the informed consent at least 24 hours in advance.

There is currently an increasing interest in non-pharmacologic methods for pain relief during labor. Women are increasingly using some of these methods during delivery so they can be more aware and in control during the birthing process. The use of nonpharmacologic methods for intrapartum pain relief involves simple, low-cost, safe techniques, that do not result in side effects for mothers or babies. Among these techniques is the use of sterile water injections (Reynolds, 2002)

Among the nonpharmacologic methods currently used at Marina Baixa Hospital are mobilization, use of Pilates balls, and massage. It would be helpful to have an additional nonpharmacologic method for pain relief such as sterile water injections (SWIs).

Midwives should have a broad knowledge of alternative pain relief methods that they can offer their patients (Hodnett, 2002; Lally, Murtagh, Macphail, & Thomson, 2008; Leap & Anderson, 2008; Lowe, 1996, 2004; Pérez, 2006).

For women who want to delay epidural analgesia or when it is contraindicated or not available, the use of SWIs can be especially helpful in relieving severe back pain that may occur in the early stages of childbirth. Sterile water injection is easy to perform, inexpensive, and has no known risks, except transient pain at the puncture site (SEGO, 2008).

Reynolds (2000) pointed out that because this technique has shown efficacy when used for intrapartum pain relief in the lower back, the challenge at present is to get hospitals to include this technique in their menu of pain relief therapy. Many caregivers are skeptical because they do not believe in nonpharmacologic methods or because they are unaware of their mechanism of action. However, this technique should be promoted among health care workers in an environment that is open to change. Sterile water injections could also be an important technique for use in third world countries where pain relief is a outstanding issue. Because this technique does not require substantial economic cost, materials, or staff, it can be useful for health services in general.

Fogarty (2008) said that although the exact method of action is unknown, the technique has consistently demonstrated efficacy as a method of analgesia during labor.

Reducing or relieving the mother's pain during childbirth is one of the objectives of midwives. The SWI technique offers a safe and effective instrument

to achieve this goal; thus, determining whether staff working with women during pregnancy and childbirth have this knowledge is important. If a lack of knowledge is detected, training on the use of SWIs along with other nonpharmacologic methods of pain relief during labor should be encouraged.

The main objectives of this study were to determine whether gynecologists and midwives employed at the 16th Health Department of the Valencia Health Agency are aware of the use of SWIs for pain relief during childbirth, and if so, whether they use it or whether they would do so in the future.

MATERIALS AND METHODS

To meet the objectives of this study, we designed an observational, descriptive, prospective, and transversal study.

In the first part, with descriptive purposes, we analyzed the knowledge among health professionals related to alternative methods of pain relief during labor and especially SWIs, the use, and the characteristics of the population in the sample.

In the second part, we analyzed the influence of caregiver sex, profession, and professional experience compared with the knowledge of alternative methods and their use.

The study population consisted of those health professionals, gynecologists, and midwives from the 16th Health Department of Alicante, who met the following criteria of being employed by the 16th Health Department of Alicante in January 2010.

Gynecologists who worked in family planning centers were excluded because they were not in contact with pregnant women or present at births.

Because it was a specific population, we were able to contact the entire study population; thus, it was not necessary to use any type of sampling.

The staff of the 16th Department of Health includes 16 gynecologists and 4 gynecology and obstetrics residents, 15 hospital-based midwives, and 10 community midwives. After getting in touch with all of them, all but 10 responded to our questionnaires.

Participants were informed orally about the study and guaranteed anonymity and confidentiality of all information. The decisions of the Declaration of Helsinki were followed.

The surveys of gynecologists and hospital-based midwives were delivered in person. The return box was placed in the office of the supervisor of the labor ward, facilitating the deposit and anonymity, as it is located inside the delivery room.

Sending out surveys for community midwives was conducted by the internal office of the Department of

Health, in an envelope personally addressed to each of them. The returns were made by internal mail on behalf of the delivery suite supervisor, who removed the envelope and deposited each questionnaire in the box, thereby ensuring anonymity.

The surveys began to post on Jan. 27, 2010, and calls were made to community midwives on the same day. Letters were distributed on Jan. 28, 2010. Once the 3-week survey period concluded, we began analyzing the results.

The questionnaire was divided into several sections. The first block corresponded to personal questions such as sex, age, profession, and place of work. The second section included questions about techniques for intrapartum pain relief. The last section focused on SWIs. The survey of community midwives included a section about maternal education and intrapartum pain relief. This section focused on education offered to pregnant women in health centers to enable us to determine what information is offered to pregnant women about nonpharmacologic methods of pain relief during labor.

Statistical Analysis

Data were processed in a Microsoft Excel database and then exported to SPSS for Windows, version 15.0. Variables were analyzed to study the calculation of basic descriptive statistics, frequency tables, averages, and SD, all with a confidence interval (CI) of 95%. In the evaluation of hypothesis tests, bivariate analysis, we used the Student's *t* test for independent samples to be tested when the variable was quantitative. In hypothesis tests, when variables were qualitative, we used Pearson's χ^2 test. Before deciding on the type of statistical test previously checked, the normal distribution of quantitative variables was determined using the Kolmogorov Smirnov test. The various tests of hypotheses were accepted as significant results for a value of $p < .05$.

RESULTS

Of the 45 questionnaires distributed to the caregivers, we received 35 responses (76%). The average number of years of professional experience among the midwives was 17.68 ± 2.43 (95% CI, 12.58-22.79). Average number of years of experience for gynecologists was 14.38 ± 3.36 (95% CI, 6.96-21.79).

The overall mean age of midwives was 45.5 ± 2.02 years (95% CI, 40.82-49.30) and the mean age of the gynecologists was 39.19 ± 2.76 years (95% CI, 33.30-45.07). Of the study participants, 82.8% ($n = 29$) were women and 17.1% ($n = 6$) were men.

Analyzing the results of the use of SWIs in daily practice, based on the profession pursued, it was determined that 26.3% ($n = 5$) of midwives and 25% ($n = 4$) of gynecologists use the technique during labor (odds ratio [OR], 1.07; $p = .92$). These results were not statistically significant and showed little use of this technique in daily practice (Table 1).

Of the group of midwives in our study 50% ($n = 7$) cited a lack of training and 35.71% ($n = 5$) a lack of experience with SWIs as the reason for not using the technique. Of the gynecologists, 91.60% ($n = 11$) said they had no previous experience. These results were statistically significant ($p = .01$) and demonstrate that the argument for not using SWIs is determined by the caregiver's training (Table 2).

Results showed that 88.88% ($n = 16$) of the midwives and 93.33% ($n = 14$) of gynecologists were willing to receive training in the use of SWI as a method of intrapartum pain relief. These results do not obtain statistical significance ($p = .64$); however, both groups showed a positive inclination to receive training in this area, highlighting that this trend is greater in the group of gynecologists.

Regarding knowledge about the use of SWIs for intrapartum pain relief in terms of sex, we found that 79.3% ($n = 23$) of women and 33.3% ($n = 2$) of men were aware of the technique (OR, 7.6). We obtained a $p = .02$, obtaining statistical significance, so we can assert that knowledge about the use of this technique for relief of pain is influenced by the caregiver's sex (Table 3).

Studying the use of SWIs and the age of participants, we found a mean of 36.22 ± 6.24 years among those using SWIs and an average of 44.50 ± 10.49 years among those that not using them. We reached statistical significance with $p = .03$, thus demonstrating a relationship between caregiver age and the use of sterile water injections. It is noted that the younger the age of those studied, the more frequent the use of SWIs for pain relief during labor (Table 4).

TABLE 1.
Use of Sterile Water Injections in Terms of the Occupation

Variable	n (%)		OR (95% CI)
	Midwives	Gynecologist	
Using SWI	5 (26.3)	4 (25)	1.07 (0.2-4.9)
Not using SWI	14 (73.68)	12 (75)	$p = .92$

SWI = sterile water injection.

TABLE 2.
Reason for Not Using Sterile Water Injections

Variable	n (%)		χ^2 p
	Midwives (%)	Gynecologist (%)	
Reason for not using SWI			10.15
No experience	5 (35.71)	11 (91.60)	.01
Not trained	7 (50)	0	
Not allowed in the hospital	1 (7.14)	0	
Other	1 (7.14)	1 (8.40)	

SWI = sterile water injection.

By relating the use of SWIs and years of professional experience, we obtained an average score of 8.06 ± 6.82 years among those who used the technique and an average score of 16.92 ± 11.90 years for those who do not ($p = .04$); thus, we can say that those with less professional experience showed an increased use of SWIs for pain relief during labor (Table 5).

Once the effectiveness of the method was proven, and based on years of professional experience, those who said they would be willing to use this technique had an average of 14.98 ± 11.97 years of working experience. Among participants who would not be willing to use this technique, the average number of years of working experience was 10 years. This result was not statistically significant ($p = .68$); however, 96.77% of the participants were willing to use the technique.

We also studied midwives' attendance of courses on the use of SWIs held at the Valencia School of Health Studies (EVES). We found that of the midwives who attended the courses given by EVES, 45.45% ($n = 5$) used SWIs, whereas 54% ($n = 6$) had never used the injections as a method of pain relief (OR, 2.1). This result reached statistical significance at $p = .03$, showing that attendance at these courses has a positive effect on the use of these injections (Table 6).

DISCUSSION

Although the majority of the study population responded to the questionnaire, the sample was very small and for this reason many of the differences in the data were not statistically significant, although they can be extracted from clinical significance.

When we analyzed the relationship between willingness to use SWIs once proven effective and profession practiced, there was a great willingness to put it into practice to ease patients' pain during labor. There appears to be no relationship between willingness to use the injections and the age of the caregiver: Those with an average of 42.77 ± 10.30 years would be willing, whereas those of an average age of 37 years would not.

All of the midwives and nearly 87% of the gynecologists felt that a large percentage of pregnant women would be interested in using this method during childbirth. These results are maintained when we related sex or years of professional experience, not statistically significance is obtain, but showing the opinions of the individuals consulted on the potential use of SWIs by pregnant women in the department. Related to this, Martensson and Wallin (2008) estimated the use of midwives on the use of SWIs by pregnant women, and said that 53% of midwives believed women would

TABLE 3.
Knowledge of the Use of Sterile Water Injections for Intrapartum Pain Relief According to Sex

Variable	n (%)		OR (95% CI) p
	Women (%)	Men (%)	
Knowledge of SWI			7.6 (1.1-52.3)
Yes	23 (79.3)	2 (33.3)	$p = .02$
No	6 (20.7)	4 (66.7)	

SWI = sterile water injection.

TABLE 4.
Use of Sterile Water Injections According to Age

Variable	n	Age
		Mean \pm SD
Use of SWI		
Yes	9	36.22 \pm 6.24
No	26	44.50 \pm 10.49
		$t = 1.95$
		$p = .03$

SWI = sterile water injection.

not be interested, 38% believed 25% of women would be interested, and 4% of midwives believed that more than 25% of women would be interested.

Martensson, McSiggin, and Mercer (2006) carried out a study to evaluate the knowledge of U.S. midwives on the use of SWIs. The authors adapted the questionnaire used in a previous study in Sweden. They sent it to 450 midwives, but only 132 answered (29%). Of the total answers received, 32% of midwives reported using SWIs in their daily practice, but they estimated that only 1.5% of women used them.

The results of our study show a greater appreciation for the use of SWIs than the research consulted, which may be motivated by the revolution in promoting minimally medicalized childbirth, offering a variety of pharmacologic and nonpharmacologic methods to pregnant women attending Spanish birthing services (Conselleria de Sanitat, 2009; FAME, 2007; Ministerio de Sanidad y Consumo, 2008).

The willingness to receive training on the use of SWIs showed that nearly 89% of the midwives and almost 94% of the gynecologists were willing to undergo training.

Lee, Martensson, and Kildea (2012) obtained similar results. Lee et al.'s study indicated that the

TABLE 5.
Use of Sterile Water Injections According to Professional Experience

Variable	n	Years of Professional Experience
		Mean \pm SD
Use of SWI		
Yes	9	8.06 \pm 6.82
No	26	16.92 \pm 11.90
		$t = 3.39$
		$p = .04$

SWI = sterile water injection.

majority of midwives in Australia were not using the SWI technique, although there was a strong desire to learn about it and explore its use during labor. Also, the study concluded that there is a need for greater information and workshops on SWI. In response to the findings, the authors are developing an online resource and training to support units to introduce SWI in their practice.

It has been observed that there was some knowledge about SWIs, but the knowledge about how to apply the technique, as well as its use, was lacking. Again, it showed a lack of information, when the Obstetrics and Gynaecology Spanish Society (SEGO, 2008) in its protocol for labor analgesia named SWIs as a nonpharmacologic method of proven effectiveness.

Martensson, Stener-Victorin, and Wallin (2008) found a lack of knowledge on the part of midwives regarding scientific studies on the use of SWIs and acupuncture for intrapartum pain relief. Their results are similar to those obtained in this study.

Martensson and Wallin (2006) also pointed out that in the textbooks used during the training of Swedish midwives, the chapter about pain relief refers to acupuncture as an effective method for pain relief; however, SWIs are not even mentioned, thus showing a lack of updated texts based on scientific studies published on the use of different alternative methods for pain relief. This could lead one to think that midwives' attitudes to pain relief also can be influenced by the texts studied, which do not seem to be updated based on new research. Midwives surveyed by Martensson and Wallin (2006) rated the desire of women and their own clinical experience as the most important factors when recommending the use of SWIs. Not recognizing as important the local and national recommendations and even scientific results as other authors (Hutton, Kasperink, Rutten, Reitsma, & Wainman, 2009).

One of the reasons given by our study participants for not using the technique was the influence of their profession ($p = .01$): Seven midwives expressed a lack of training (50%) and five reported having no experience (35.71%). Among gynecologists, nearly all participants ($n = 11$, 91.7%) argued that the reason for not using this technique was their lack of experience. It should be noted that one midwife said SWIs were banned in the hospital, once again showing a lack of knowledge, as there is no protocol, guide for action, or internal regulation on the matter. A lack of knowledge was also observed regarding the recommendations of the SEGO (2008) and the Federation of Associations of Midwives in Spain (FAME, 2007), both of which have recommended this technique for pain relief. The results obtained in our study are

TABLE 6.
Relationship Between Attending EVES Courses and the Use of Sterile Water Injections in Midwives

Variable	n (%)		OR (95% CI)
	Attendance of EVES Courses (%)	No Attendance of EVES Courses (%)	
Use of SWI			2.1 (1.2-3.8)
Yes	5 (45.45)	0	$p = .03$
No	6 (54.54)	7 (100)	

SWI = sterile water injection; EVES = Valencia School of Health Studies.

consistent with those obtained by [Martensson and Wallin \(2008\)](#), showing “not having experience in their use” and “no training” as the major reasons for not using SWI.

This lack of knowledge seems to occur also among midwives in New Zealand. A study by [Duff \(2008\)](#) observed a lack of information on this technique, and that no New Zealand midwifery training program included this technique in their studies.

Only five of the midwives (26.3%) and four of the gynecologists (25%) used SWIs in the labors they attend daily. The utilization rate is very low; thus, this is a technique that requires further information to promote use.

From the results of the survey, it can be stated that knowledge of SWI is influenced by sex, with women having more knowledge about the technique ($p = .02$): 79.3% ($n = 23$) of women versus 33.3% ($n = 2$) of men had knowledge about the method.

Use of this technique is influenced by age ($p = .03$), with the average age being 36.22 ± 6.24 years for those who use SWIs and 44.50 ± 10.49 years for those who do not. Professional experience ($p = .04$) also influenced the use of SWIs. Our results demonstrated an average age of 8.06 ± 6.82 years for those who use them, and a mean age of 16.92 ± 11.90 years for those who do not. Thus, we can conclude that older caregivers with more professional experience use SWI for pain relief during labor less often. There is the possibility that the group with less professional experience, and therefore younger, are more updated and more motivated on these issues.

The average age of midwives in this study was 17.68 years, similar to those in [Martensson and Wallin's study \(2006\)](#), where the average age was 17.62. In that study, the use of injections of SWI was estimated at 2% in Sweden. Our study put this estimation at 26.3%, but given the limited sample it cannot be said that results are extensible to the rest of the population of midwives in Spain.

Courses on updates in normal labor are part of the EVES training and have been available in several editions since September 2010. The creation of an exclusive session on this method would improve the understanding and increase the use of the technique. Visualization through the use of a video or a direct demonstration during the session would also prove helpful and offer an opportunity to answer many questions ([Reynolds, 2000](#)). A positive relationship between attendance of these courses and the use of SWIs has been demonstrated ($p = .03$); thus, attendance at these courses would probably influence the use of new techniques.

Changing a practice can be difficult; identifying barriers to change is an important step in planning the implementation of a new technique. This will help identify areas where efforts need to be strengthened and design the interventions required ([Donoghue, 2006](#)). One of the techniques used by [Donoghue](#) to investigate the barriers was a survey. In their guide “How to Change Practice,” the National Institute for Health and Clinical Excellence ([NICE, 2007](#)) identified the barriers of change, naming, among others, a lack of awareness and knowledge of what needs to be changed; motivation and external factors: financial and political factors may influence the desire, motivation, and skills to achieve change. Other barriers identified by [NICE \(2007\)](#), such as lack of personnel, infrastructure, costs, and the like, have not been identified in this case. The use of SWIs for intrapartum pain relief barely involves cost. All materials needed (needles, syringes, and sterile water) are present in delivery suite, so it would not be necessary to invest in new equipment or to expand the workforce.

A factor that can positively influence the use of SWIs is the creation of a statewide “Strategy for Normal Delivery Care” by the National Health Service ([Ministerio de Sanidad y Consumo, 2008](#)) and the “Strategy for Normal Delivery Care in the Valencia Area” ([Conselleria de Sanitat 2009](#)). Both strategies

were created at a time when the need to review and update normal delivery care to the most recent recommendations were identified.

Both strategies aim to provide women maximum care, while recognizing their rights to give birth with respect, privacy, participation in decision making, and in the best conditions for both mother and baby. The current model of hospital care has led to an increase in the use of technology and unnecessary procedures. These strategies were created to increase the humanization and reduce interventionist process of normal delivery care. The [Conselleria de Sanitat \(2009\)](#) identifies not only the barriers (weaknesses), but the strengths of professionals to promote change. In addition to the perceived need for change, supported by scientific evidence, reinforcing the attitude of professionals, it identifies the institutional support. This is undoubtedly the most important strength for change.

Focusing on the objective of this study, to implement the use of SWIs, the maternity department could ([NICE, 2007](#)):

- encourage the reading of the available scientific evidence;
- create a protocol use guide for SWI;
- take into account the views of women regarding pain relief; and
- organize workshops and training courses on SWIs for intrapartum pain relief and other alternative methods.

Based on this study, the research line to be followed would be to conduct a randomized control group study in the same hospital. This study would

check the results on the effectiveness of SWIs for intrapartum pain relief in the Spanish population because no studies of this type exist. If the technique's efficacy is demonstrated, chances are the majority of professionals would be willing to use it.

This study explored the knowledge of SWI for pain relief in labor. The results confirm the need for midwives and gynecologists to receive training and education about the use of the technique. Therefore, the most important recommendation is to promote an educational program focused on the use of SWI within the standard procedures of midwives. This would be a great step toward the reduction of pain during labor.

CONCLUSIONS

The following conclusions can be drawn based on the results of this study:

1. Both midwives and obstetricians demonstrated a lack of knowledge about SWIs; however, women seem to have more knowledge about this technique.
2. Younger and those with less professional experience, both gynecologists and midwives, used SWIs more often.
3. Both gynecologists and midwives expressed a need for training regarding SWIs.
4. Professionals show a broad willingness to use the technique once its efficacy is demonstrated.
5. Educational programs on SWI should be developed to promote its usage in normal labors.

REFERENCES

- Conselleria de Sanitat. (2009). *Estrategia para la atención del parto normal en la comunidad Valenciana* [Care in normal delivery strategy in Valencia community]. Ed Generalitat: Author.
- Donoghue, E. (2006). *Barriers and enablers. Using evidence: Using guidelines*. Retrieved September 15, 2010 from www.nicsl.com.au
- Duff, M. (2008). Sterile water injections for back pain in labour. *New Zealand College of Midwives*, 39, 33–38.
- Federación de Asociaciones de matronas de España (FAME). (2007). *Iniciativa Parto normal. Documento de Consenso. [Normal delivery initiative. Consensus document]*, (1st ed.) Barcelona: Author.
- Fogarty, V. (2008). Intradermal sterile water injections for pain relief of low back pain in labour—A systematic review of the literature. *Women and Birth*, 21, 157–163.
- Hodnett, E. D. (2002). Pain and women's satisfaction with the experience of childbirth: A systematic review. *American Journal of Obstetrics and Gynecology*, 186, 160–174.
- Hutton, E. K., Kasperink, M., Rutten, M., Reitsma, A., & Wainman, B. (2009). Sterile water injection for labour pain: A systematic review and meta-analysis of randomised controlled trials. *British Journal of Obstetrics and Gynecology*, 116, 1158–1166.
- Lally, J., Murtagh, M., Macphail, S., & Thomson, R. (2008). More in hope than expectation: A systematic review of women's expectations and experience of pain relief in labour. *Medicine*, 6, 7.
- Leap, N., & Anderson, T. (2008). The role of pain in normal birth and the empowerment of women. In S. Downe (Ed.), *Normal childbirth: Evidence and debate*, (2nd ed.) (pp. 29–46) Edinburgh: Churchill Livingstone.
- Lee, N., Martensson, L., & Kildea, S. (2012). Cross sectional study of Australian midwives knowledge and use of sterile water injections for pain relief in labour. *Women and Birth*, 25, e75–e80.
- Lowe, N. (1996). The pain and discomfort of labour and birth. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 25(1), 82–92.

Lowe, N. (2004). Context and process of inform context for pharmacologic strategies in labour pain care. *Journal of Midwifery and Women's Health*, 49(3), 250-259.

Martensson, L., McSiggan, M., & Mercer, J. (2006). US Midwives' knowledge and use of sterile water injections for labor pain. *Journal of Midwifery and Women's*, 53(2), 115-122.

Martensson, L., Stener-Victorin, E., & Wallin, G. (2008). Acupuncture versus subcutaneous injections of sterile water as treatment for labour pain. *Acta Obstetricia et Gynecologica*, 87, 171-177.

Martensson, L., & Wallin, G. (2006). Use of acupuncture and sterile water injection for labor pain: A survey in Sweden. *Birth*, 33(4), 289-296.

Martensson, L., & Wallin, G. (2008). Sterile water injections as treatment for low-back pain during labour: A review. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 48, 369-374.

Ministerio de Sanidad y Consumo. (2008). *Estrategia de atención al parto normal en el Sistema Nacional de Salud*. [Care in normal delivery in the national health system]. Madrid: Author.

National Institute for Health and Clinical Excellence (NICE). (2007). *How to change practice*. London: Author.

Pérez, L. (2006). Manejo del dolor del trabajo de parto con métodos alternativos y complementarios al uso de fármacos. [Management of pain in labor with alternative and complementary methods]. *Matronas Profesión*, 7(1), 14-22.

Reynolds, J. L. (2000). Sterile water injections relieve back pain of labour. *Birth*, 27(1), 58-60.

Reynolds, J. L. (2002). Sterile water injections as a unique way to relieve back pain in labour. *International Journal of Childbirth Education*, 17(1), 24-25.

Sociedad Española de Ginecología y Obstetricia (SEGO). (2008). Protocolos de la SEGO. Analgesia del parto. [SEGO Protocols. Analgesia in labor]. *Progresos en Obstetricia y Ginecología*, 51(6), 374-383.