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A comparative study of the effect of treatment for labor pain with changes in VAS scores

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Assessing pain in relation to childbirth is one of the midwife's more important tasks. However, pain research shows that health care professionals often assess patients' pain inaccurately. The Visual Analogue Scale (VAS) is one of the most used instruments for assessing pain and pain relief both in research and clinical practice. On the other hand, a patient's verbal report is considered to be the single most reliable indicator of how much pain the patient is experiencing. The aim of this study was to compare women's verbally reported effect of treatment for labor pain with changes in VAS scores. This comparative prospective study was carrying out on a labor ward with approximately 2,500 deliveries annually in western part of Sweden. Women (n=122) at gestational week 37 to 42 with spontaneous onset of labor, requesting pain relief, were randomized to one of two treatments: acupuncture or sterile water injections. Pain was assessed on a VAS before as well as 30, 60, 90, 120, 150 and 180 min after treatment. Within two hours after delivery the women were asked to verbally report the effectiveness with the treatment. Main outcome measure was agreement between VAS scores and verbal reports. Non-parametric tests were used. All tests were two-tailed at the significance level p< 0.05. The distribution of the VAS scores 30 min after administration of pain relief showed that the women verbally responding that treatment was "very effective", also rated their pain significantly lower (p< 0.001) on the VAS, compared to the women verbally reporting otherwise. A moderate correlation (r = 0.56; p< 0.001) was obtained between VAS-scored pain change after 30 min and verbally reported pain relief effect. The women who stated that treatment was "very effective" also rated their pain significantly lower at 30, 60 and 90 min on the VAS, compared to baseline. This study confirms that verbal reports and changes in VAS scores are reliable indicators of treatment effect for labor pain. It might, however, be valuable to combine VAS scores with verbal reports for a more extensive assessment of treatment effect.

Key word: Childbirth, pain, pain relief, verbal reports, visual analogue scale.

INTRODUCTION

Assessing the birthing woman's requirement for pain relief, while respecting her need to remain in control and her own wishes, choices and expectations (Gibbins and Thomson, 2001; Hauck et al., 2007; McCrea and Wright, 1999), is one of the midwife's more important tasks. However, pain research shows that health care professionals often assess patients' pain inaccurately (Olden et al., 1995; Solomon, 2001; Baker et al., 2001). For example, Baker et al. (2001) found that midwives were less able to assess pain accurately when women described their pain as severe. This is problematic since 60 to 90% of women in labor experience severe pain at some point during childbirth (Melzack, 1984; Ranta et al., 1995). It is thus necessary to evaluate pain and effect of pain relief with valid and reliable standardized self-assessment instruments.

The patient's verbal report is considered to be the single most reliable indicator of how much pain she is

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experiencing (Closs, 1996; Jensen and Karoly, 2001; Jacox, 1979; McCaffery, 1979). The Visual Analogue Scale (VAS) is one of the most used pain assessment instruments, both in research and clinical practice (Jensen et al., 1986; Myles and Urquhart, 2005; Yarnitsky et al., 1996). In order to elucidate as much as possible, of the patient's experience of pain it is very important to combine methods of assessing pain intensity (Mårtensson, 2006; Bergh, 2003).

The VAS has proved to be both reliable (Gaston-Johansson, 1996; Melzack, 1987) and sensitive for assessing labor pain and treatment effect (Mårtensson, 2006; Gaston-Johansson, 1996; Bricker and Lavender, 2002). The woman's verbal report has also been shown to be a valid indicator of pain relief when assessing treatment effect for labor pain (Mårtensson et al., 2008). However, comparison of VAS scores with patients' verbal reports has not resulted in consistently clear patterns. For instance, when Bergh et al. (2001) compared geriatric patients' verbal reports of pain relief with VAS scores, the patients verbally reporting pain relief did have significantly lower mean VAS scores ($p< 0.001$). However, for approximately one third of these patients, the deviation in pain scores between the initial assessments and re-assessments indicated unchanged or even increased pain. DeLoach et al. (1998) found the same disagreement when using a VAS in postoperative care. When Mårtensson et al. (2006) compared recently delivered women's perception of pain relief with the midwives' clinical assessment of pain relief effect, there were no significant differences. Verbal reports of pain and pain relief and self-reported ratings on pain scales are both subjective expressions (Jensen, 1997), but comparison between them may yield interesting results (Altman, 1999).

The aim of this study is to compare women's verbally reported effect of treatment for labor pain with changes in VAS scores.

METHODS

This study has a comparative prospective design and is a part of a larger trial. Women at gestational week 37 to 42 with spontaneous onset of labor, requesting pain relief, were randomized to one of two treatments: acupuncture or sterile water injections. Pain was assessed on a VAS immediately after a uterine contraction before as well as 30, 60, 90, 120, 150 and 180 min after treatment. Within two hours after delivery the women were asked to verbally report the effectiveness of the treatment. Other results from this study have been reported earlier (Mårtensson et al., 2008). Due to internal dropout, 122 women (mean age 29) of the original group of 128 were included in this study. The study was approved by the Research Ethics Committee of the Medical Faculty at the University of Gothenburg, (7th December, 2003; Dnr: Ö 476-03).

Instruments

The VAS used in this study to assess the women's experience of pain consisted of a 100 mm long horizontal line with the endpoints no pain and worst conceivable pain. The pain experience was assessed by the woman marking the appropriate point on the line (Huskisson, 1983). The women's verbal reports of the effectiveness with pain relief were divided into four response categories:

Very effective.
Fairly effective.
Not very effective.
Not at all effective.

Statistical analysis

Non-parametric tests were used, since data characteristics did not meet the criteria for parametric analysis (that is, normally distributed, interval or ratio data) (Polit and Beck, 2004). Spearman's rho (rs) was used to determine the association between VAS scores and verbal reports. The Kruskal- Wallis Test and Mann Whitney U-test (independent groups) were used when appropriate. The Wilcoxon test was used when comparing dependent groups (Polit and Beck, 2004). All tests were two-tailed at the significance level $p< 0.05$. Data were analyzed with SPSS for Windows version 18.

RESULTS

The distribution of VAS scores obtained 30 min after administered pain relief showed that the women who had verbally responded that treatment was "very effective" rated their pain significantly lower on the VAS ($p< 0.001$) than women verbally reporting otherwise (Figure 1 and 2). There were no significant differences in VAS scores between women who reported that the treatment was "fairly effective" and those responding "not very effective". The women who responded "not at all effective" had significantly higher ($p< 0.02$ to 0.001) VAS scores 30 min after treatment, compared to the women who responded otherwise. Figure 1 also shows a wide distribution of the VAS scores in all four response categories (very effective: range = 87 mm, fairly effective: range = 74 mm, not very effective: range = 82 mm, not at all effective: range = 76 mm). There was also a moderate correlation ($r = 0.56$; $p< 0.001$) between the women's VAS-rated pain change after 30 min and the verbally reported pain relief.

There were no significant differences between the VAS scores in the four response groups at baseline. There were, however, significant differences in VAS scores between the response categories at 30 min ($p< 0.001$), 60 min ($p< 0.001$) and 90 min ($p< 0.001$), but not at 120 min ($p = 0.586$), 150 min ($p = 0.610$) or 180 min ($p = 0.273$) (Kruskal-Wallis Test) (Figure 3).

The women who stated that the treatment was "very effective" also rated their pain on the VAS significantly lower at 30, 60 and 90 min, compared to baseline. Table 1 also shows that the women reporting treatment as "not very effective" or "not at all effective" had non-significant decreases in VAS scores at all time-points, compared to baseline.

When the changes between women's VAS scores at 30 min and at baseline were analyzed, some women's scores directly contradicted their verbally reported treatment

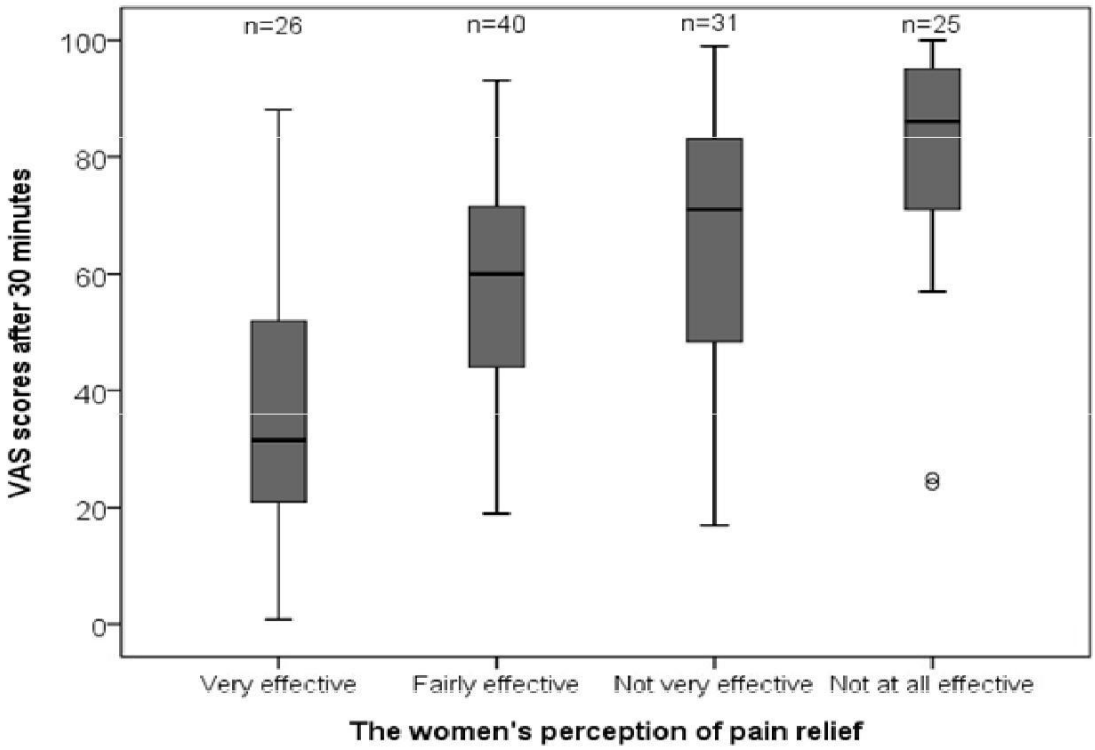
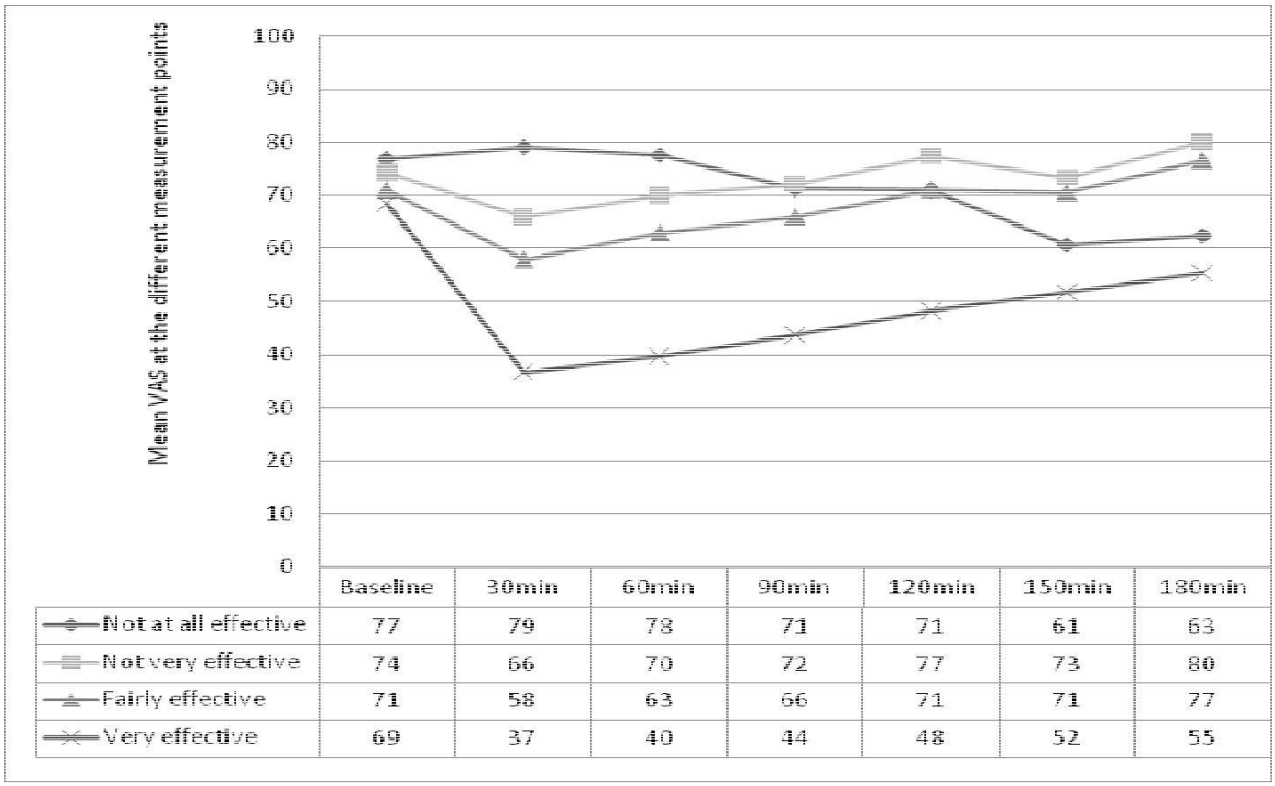


Figure 1. The distribution of the women's (n=122) pain scores on the VAS 30 min after administration of pain relief treatment, according to the four verbal response categories.



	Baseline	30min	60min	90min	120min	150min	180min
Not at all effective	77	79	78	71	71	61	63
Not very effective	74	66	70	72	77	73	80
Fairly effective	71	58	63	66	71	71	77
Very effective	69	37	40	44	48	52	55

Figure 2. Mean VAS scores (mm) distributed according to the four verbal response categories at the Different time-points, (n=122).

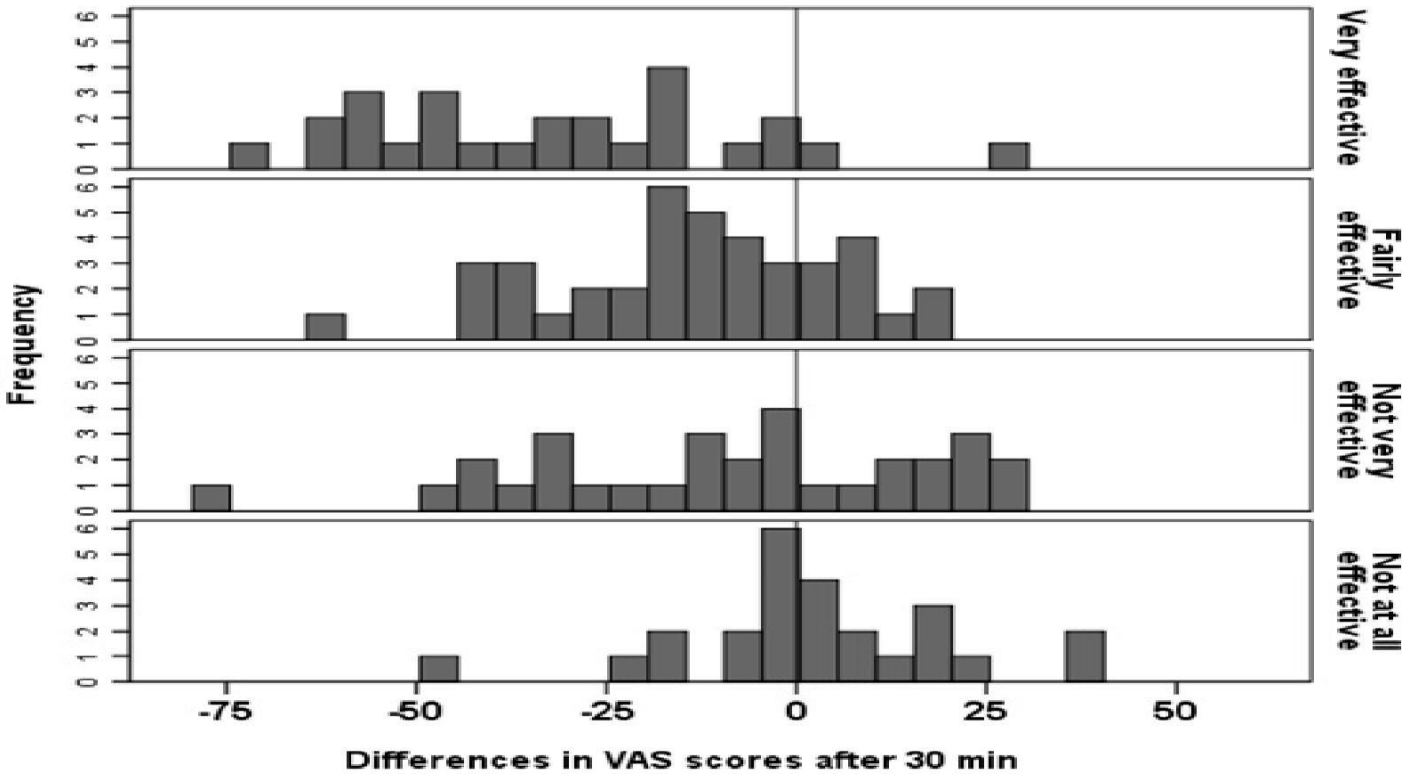


Figure 3. Differences between VAS scores at 30 min and at baseline, distributed according to the four response categories, (n=122).

Table 1. Verbally reported effect of administered pain relief, compared to the changes between VAS scores at different time-points and baseline VAS scores, (n=122).

Time-point (min)	The women's verbal report of pain relief			
	Very effective	Fairly effective	Not very effective	Not at all effective
30	p<0.001 (n=26)	p<0.001 (n=40)	p=0.117 (n=31)	p=0.475 (n=25)
60	p<0.001 (n=24)	p<0.076 (n=36)	p=0.456 (n=27)	p=0.573 (n=22)
90	p<0.01 (n=22)	p=0.504 (n=30)	p=0.408 (n=20)	p=0.965 (n=12)
120	p=0.346 (n=18)	p=0.736 (n=27)	p=0.722 (n=17)	p=0.735 (n=8)
150	p=0.228 (n=16)	p=0.831 (n=17)	p=0.944 (n=8)	p=0.344 (n=6)
180	p=0.941(n=13)	p=0.221 (n=15)	p=0.310 (n=7)	p=0.715 (n=4)

effect. This pattern was less pronounced among the women who reported the treatment to be "very effective" (Figure 3).

DISCUSSION

The main finding in this study was that women's verbally reported effect of treatment for labor pain concurred with changes in their VAS pain scores. Nonetheless, there was a wide distribution of VAS scores in all four response categories, resulting in overlap between the categories: 1) Very effective, 2) fairly effective, 3) not very effective and 4) not at all effective. However, if a woman reports that a given treatment is "very effective", it does not necessarily mean that another woman would assign the same quantitative meaning to that expression. Several previous studies have shown that individuals scoring different pain descriptors on a VAS will convey different quantitative meanings to them (Bergh and Sjöström, 2007; Gaston-Johansson, 1984; 1985; Sriwatanakul et al., 1982; Norvell et al., 1990). Moreover, the verbal reports and VAS score changes were discordant in some cases. This phenomenon has been reported when other pain populations have been evaluated similarly (Bergh et al., 2001; DeLoach et al., 1998). This discrepancy was, however, less pronounced among those women who had a distinct opinion concerning whether or not the given

treatment had been effective (that is, “very effective” or “not at all effective”). In conclusion, this study confirms that both verbal reports (Mårtensson, 2006) and changes in VAS scores (Mårtensson, 2006; Gaston-Johansson, 1996; Bricker and Lavender, 2002) are reliable indicators of the effect of treatment for labor pain, independently of one another. Furthermore, combining VAS scores with verbal reports may be valuable when assessing the effect of administered treatment for labor pain.

Conclusions

This study confirms that verbal reports and changes in VAS scores are reliable indicators of treatment effect for labor pain. It might, however, be valuable to combine VAS scores with verbal reports for a more extensive assessment of treatment effect.

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