Perceptions of labour pain by mothers and their attending midwives

Aims. The aim of the current study was to examine the perception of pain by labouring women and their attendant midwife, from the onset of labour to delivery.

Rationale. Accurate measurement and appropriate management of pain is a significant problem for attendant medical and nursing personnel. Both the experience and perception of pain are regarded as subjective and are therefore difficult to measure objectively. Indeed, much of the literature reports that pain is often under- or over-estimated by nursing staff who as a consequence consistently fail to administer adequate analgesia. Few studies have specifically examined the ability of midwives to assess the pain of labouring women.

Design. The short form McGill Pain Questionnaire (SF-MPQ), routinely used to assess pain in obstetric environments, was used to determine pain perception. Thirteen labouring women and nine midwives completed the SF-MPQ every 15 minutes beginning at the time of admittance to the delivery suite. Peak pain ratings for the preceding 15 minutes were obtained without reference to prior ratings or each other’s scores. Further, midwives in the maternity unit of The Queen Elizabeth Hospital (TQEH), Adelaide, South Australia completed a survey investigating the cues they use to assess pain during labour.

Results. On each measure of pain on the SF-MPQ, the midwives scores correlated with the mothers’ scores across the entire pain range. Further analysis showed that mothers’ and midwives’ pain scores were similar at mild-moderate pain levels, but midwives significantly underestimated pain intensity at levels that mothers described as severe. The survey responses indicated that midwives rely on both verbal and nonverbal cues to assess pain levels.
Introduction

Childbirth, while primarily a joyful event, also exposes the mother to one of the severest forms of pain reported (Melzack 1984, Niven & Gijsbers 1984a). Labour associated with human childbirth is a painful experience, irrespective of social and ethnic backgrounds (Weisenberg & Caspi 1989, Chamberlain 1993). A study of labouring women in the United Kingdom indicated that 93.5% of the women described the pain as severe or unbearable (Steer 1983), while in Finland 80% described it as very severe or intolerable (Ranta 1995). Thus, there exists a requirement for appropriate assessment and management of labour pain to ensure the experience remains positive.

The degree of pain experienced during labour is related to the frequency, intensity and duration of uterine contractions and dilatation of the cervix (Corli et al. 1986, Melzack 1993). In addition, the position of the foetus, descent of the presenting part, stretching of the perineum and pressure on the bladder, bowel and sensitive pelvic structures also contribute to pain levels (Melzack et al. 1984). Previous studies have assessed pain levels at different stages of cervical dilatation (Melzack et al. 1981, Scott-Palmer & Skevington 1981, Niven & Gijsbers 1984a, Bonnel & Boureau 1985, Corli et al. 1986, Fridh et al. 1988, Gaston-Johansson et al. 1988, Wuitchik et al. 1990). Melzack et al. (1981) asked labouring women to complete the Short Form McGill Pain Questionnaire (SF-MPQ, routinely used for assessment of labour pain) when the cervix was 2–3 cm and contractions at least 5 minutes apart. Twenty-five percent of primiparous and 9% of multiparous women reported their pain as horrible or excruciating. A separate study reported pain at three different time points based on the degree of cervical dilatation and found that when the cervix was 2–4 cm dilated the pain was most intense (Gaston-Johansson et al. 1988). A similar division of this period of labour into three phases indicated that cervix dilatation of 0–3 cm was distressing, 4–7 cm was horrible and >8 cm was excruciating (Wuitchik et al. 1990). Similarly, measurement of pain at 3, 5, 7 and 10 cm dilatation and 24 hours postdelivery, indicated that pain intensity increased as labour progressed (Bonnel & Boureau 1985).

Conclusions. The cues used by midwives to differentiate pain intensities and qualities are similar to those used in other clinical settings, but may have limited discriminatory value as pain levels become severe.

Keywords: pain, perceptions, mothers, midwives, labour, SF-MPQ

Both the experience and perception of pain are regarded as subjective and thus remain difficult for an observer to measure objectively (Well 1984, Choiniere et al. 1990, O’Connor 1995, Simons & Malabar 1995). Pain and its associated behaviours are highly variable between individuals and for an individual across time (McCaffery 1979, Melzack 1984, Lowe 1987a; Fridh et al. 1988). It has also been suggested that the intensity of pain is directly dependant on the meaning and significance of the event causing the pain (Beecher 1956), and the desire to attain specific goals (Fishbain et al. 1995). Labour pain is further reported to be influenced by psychological variables, such as fear and anxiety (Melzack et al. 1981, Price 1988, Wade et al. 1990). Together, such factors make it inherently difficult for care providers to accurately assess and effectively manage pain. Thus, pain management remains a significant problem confronting attendant health personnel (Carr 1997a).

Much of the general literature investigating pain perception by patients and attendant staff indicates that nurses often under- or over-estimate pain levels and consistently fail to administer adequate analgesia (Choiniere et al. 1990, Melzack 1990, Rajan 1993, McCaffery & Ferrell 1994, O’Connor 1995). A limited amount of literature exists specifically addressing the ability of midwives to accurately assess the pain of labouring women. Bradley et al. (1983) reported that midwives’ perceptions of the experience were significantly different from the mothers’ experience after the event. In another study mothers were asked to rate their pain level once, immediately prior to administration of analgesia. At the same time both midwives and obstetricians indicated their perceptions of the women’s pain. The data suggested that in general, midwives underestimated the pain of the mother (Sheiner et al. 2000). Fridh and Gaston-Johansson (1990) reported no correlation between the midwives’ and mothers’ rating of the intensity of pain late in stage 1 of labour (prior to delivery).

The study

The present study aimed to extend the current knowledge by recording pain levels of labouring women and the midwives’ perceptions of the mothers’ pain repeatedly through stage 1
Perceptions of labour pain

Assess pain was distributed to 72 midwives at TQEH. The survey designed to ascertain the cues midwives utilize to assess pain and the methods they use.

Methods

Ethical considerations

The protocol was approved by the Human Ethics Committee at both The Queen Elizabeth Hospital and the University of South Australia. In addition, both pregnant women and their partners gave informed consent to participate in the study.

Subjects: labouring mothers – labour pain

Expectant mothers were recruited primarily through the antenatal clinic of The Queen Elizabeth Hospital (TQEH) in Adelaide, South Australia. Thirteen healthy pregnant volunteers, five primiparous and eight multiparous, aged between 23–39 years (31.5 ± 4.9 years, mean ± SEM) agreed to participate in the study from 411 approached. The study involved the repeated assessment of labour pain by mother and midwife (reported here) and the capturing of video images of the labour and delivery (reported elsewhere). Expectant mothers were excluded if they (a) had a medical or psychiatric condition that would necessitate delivery by elective caesarean section (b) anticipated the use of epidural anaesthetic or (c) were unable to speak or write English. All mothers delivered in hospital between November 1994 and October 1996 and were either married or in a defacto relationship at the time of delivery. Partners were present during both labour and delivery for all births. Of the 13 expectant mothers, nine had normal vaginal deliveries, two had forceps deliveries and two had emergency caesarean sections.

Subjects: midwives – labour pain

Nine midwives aged 29–42 years (36 ± 1 years) with 8.5 (±2) years labour ward experience were recruited through the hospital where the labouring mothers were admitted. The midwife assigned to care for an expectant mother participating in the study was enrolled into the study during the time the mother was being admitted and settled into the labour ward. All midwives approached agreed to participate and three were responsible for more than one woman in the study.

Subjects: midwives – cues

A survey designed to ascertain the cues midwives utilize to assess pain was distributed to 72 midwives at TQEH. The midwives in this group ranged from 23–57 years (33 ± 1 years) and had 6.1 ± 0.8 years experience.

Measures: assessment of labour pain

Labour pain levels were obtained using the Short Form McGill Pain Questionnaire (SF-MPQ) (Iafrati 1986), which was developed for use in obstetric environments where rapid administration is required (Melzack 1987). The SF-MPQ combines a Visual Analogue Scale (VAS), Verbal Response Scale (VRS) and a Present Pain Intensity scale (PPI), providing a comprehensive description of pain, including intensity and sensory and affective dimensions.

The VAS is a 10 cm straight line that represents a continuum of pain intensity. There are verbal anchors at each end of the line: ‘no pain’ and ‘worst possible’. Subjects place a mark on the line that represented their level of pain intensity (McGuire 1984, Jensen et al. 1986). The distance from the left-hand side quantifies pain level (McGuire 1984, Chapman et al. 1985). VAS scores were used to categorize pain as either mild-moderate (0–7) or severe (7.1–10) based on a previous definition (Carr 1997b). Differences between the patient and care provider VAS scores greater than one centimetre are considered either an under- or overestimation (Iafrati 1986, Choiniere et al. 1990).

The VRS is a list of 15 adjectives that can be individually selected and ranked as either none, mild, moderate or severe (0–4). It measures 11 sensory (e.g. throbbing, stabbing, cramping) and four affective (e.g. sickening, punishing-cruel) qualities of pain and can be divided into three different scores. The total VRS combines both sensory and affective qualities and has a maximum score of 45. The sensory category has a maximum score of 33 and the affective category has a maximum score of 12.

The PPI measures pain intensity on a 6-point rating scale from ‘no pain’ (0) to ‘excruciating’ (5).

Measures: stages of labour and labour pain scores

Three distinct stages of labour were defined for the current study based on previous definitions (Llewellyn-Jones 1969, Myles 1981, Well 1984). The first stage of labour begins with the onset of painful rhythmic uterine contractions and ends with the full dilatation of the cervix (10 cm). Second stage begins when the cervix is fully dilated and ends with the delivery of the foetus. Third stage begins after the birth of the baby and ends with the expulsion of the placenta and membranes (Llewellyn-Jones 1969, Myles 1981, Well 1984). The transition from first to second stage labour in the present study was determined at the time of data analysis, using the time recorded in the birth registry (register of outcomes of all labours at TQEH).
Measures: survey questionnaires for midwives
Midwives were required to rank a list of 13 cues in terms of 'the most reliable indicator of pain'. The cues provided were – verbal response from partner/relative/support person, eye movement (e.g. eye contact increased, decreased, tears), facial expressions (e.g. grimacing, muscle tension), body movement (position, posture, movement), hand movements (clenched fist, stretched hands, palm up/down), CTG tracing/TOC score (contraction timing/tone of uterus), vocalizations (e.g. sighing, crying, changes in pitch), emotional state (e.g. anger, sadness, fear, change in mood), physiological state (e.g. temperature, pulse, blood pressure, respiratory rate, hydration), distance (e.g. physical withdrawal), verbal request from patient, other (midwife to specify).

Procedure
The researcher was present during both labour and delivery. Labouring mothers completed the SF-MPQ at 15-minute intervals. Mothers recorded the quality and intensity of the peak pain experienced during the preceding 15 minutes Pain reports were collected between contractions by the researcher. Attendant midwives completed the SF-MPQ at the same time as the labouring mother. All pain assessments were completed without reference to previous pain ratings or each others’ pain reports.

Data analysis
Correlation analyses were conducted on all pain scores from mothers and midwives for each of the pain measures (VAS, VRS and PPI). Paired t-tests (two-tailed) were used to compare pain scores on the SF-MPQ for mothers and midwives during both mild-moderate and severe pain levels as determined by the VAS data. Significance was set at \( P < 0.05 \) and nonsignificance is indicated by ‘NS’. The survey responses were ranked according to the order of priority.

Results

Labour pain
The first VAS (4.5 ± 1.0) reported by the mothers was less than the last VAS (7.6 ± 0.7), indicating that mothers were in more pain at the end of labour than at the beginning. Twelve of the 13 mothers ceased reporting pain towards the end of the first stage. At this time women waved the researcher away or could not hold a pen or articulate their level of pain. The average length of the labours varied considerably between women, ranging from 107 to 1214 minutes (421 ± 91 minutes). For the period where the mothers were able to record pain they spent between 0–300 minutes (103 ± 34 minutes) in mild-moderate pain and between 2165 minutes (89 ± 27 minutes) in severe pain. Pain recordings ceased between 1–144 minutes (58 ± 15 minutes) prior to delivery.

Generally, the first VAS (5.7 ± 0.7) reported by midwives was less than the last (7.3 ± 0.6) (Figure 1). Thus, midwives perceived mothers to be in more pain at the end of labour than at the beginning.

Stages of labour and labour pain scores
The time spent in the first stage ranged from 60 to 1110 minutes (410 ± 84 minutes). The highest VAS pain score recorded during the first stage was 10, recorded 144 minutes prior to delivery. Time spent in second stage (recorded in the register by staff) ranged from 399 minutes (25 ± 8 minutes). The only VAS score reported during second stage was 9.8, 2 minutes prior to delivery.

Visual analogue scale
There was a significant correlation between mothers’ and midwives’ scores on the VAS (\( r = 0.79, P < 0.05 \)). When the scores were divided into mild-moderate and severe, no significant difference was found between the mean VAS scores for the mothers and midwives during mild-moderate pain (\( t(68) = -1.671, \text{NS} \)). However, during severe pain midwives’ mean VAS scores were significantly lower than mothers’ (\( t(30) = 2.157, P < 0.05 \)) (Figure 1).
Verbal response scale

Total VRS – A significant correlation was found between mothers’ and midwives’ scores on the VRS across all scores ($r = 0.45$, $P < 0.05$). During mild-moderate pain there was a significant difference between mean VRS for mothers and midwives ($t(68) = 6.795$, $P < 0.05$). However, there was no significant difference during severe pain ($t(28) = 1.837$, NS) (Figure 2a).

Sensory VRS – No significant correlation was found between the mothers’ and midwives’ scores on the sensory measures of the VRS ($r = 0.28$, NS). In mild-moderate pain there was a significant difference between mean Sensory VRS scores for mothers and midwives ($t(67) = 6.896$, $P < 0.05$). However, there was no significant difference during severe pain ($t(29) = 1.571$, NS) (Figure 2b).

Affective VRS – A highly significant correlation was found between mothers’ and midwives’ scores on the affective measure of the VRS ($r = 0.70$, $P < 0.05$). Further, there was a significant difference found between mean Affective VRS scores during mild-moderate pain ($t(67) = 2.838$, $P < 0.05$) but not during severe pain ($t(29) = 1.586$, NS) (Figure 2c).

Present pain intensity scale

A significant correlation was found between the PPI scores of the mothers and midwives ($r = 0.75$, $P < 0.05$). There was a significant difference between mean PPI scores during severe pain ($t(25) = 2.301$, $P < 0.05$), however, not during mild-moderate pain ($t(60) = 0.910$, NS) (Figure 3).

Midwives: cues

Of the 72 surveys distributed to midwives, 46 (63%) were returned. Midwives ranked a list of 13 verbal and nonverbal cues in terms of ‘the most reliable indicator of pain’: 69.5% ranked facial expressions, 52.2% verbal report from the patient, 47.8% body movement and 37.0% vocalizations in one of the top three positions (Figure 4).

Discussion

On all measures of pain using the SF-MPQ, mothers’ and midwives’ scores were significantly correlated. However, when the scores were separated into mild-moderate and severe categories the data indicated that midwives were reliable estimators of mothers’ pain intensity at mild-moderate levels, but underestimated intensity at severe levels (VAS and PPI). In contrast, the VRS scores indicated that the midwives were able to estimate the sensory and affective characteristics during severe pain but underestimated them during mild-moderate pain. Thus, while mothers’ and midwives’ scores correlated across all pain levels and for all measures, where
the scores differed significantly, it was consistently an under-
estimation by the midwives. The cues used by midwives to
assess pain during labour were determined to be both verbal
and nonverbal in nature.

Although the aim of the current project was to examine
pain during the first and second stages of labour, only one
woman from 13 was able to complete the SF-MPQ during the
second stage. Administration of the SF-MPQ every 15 minutes
was demanding on the mother and the researcher, despite its
application between contractions. As contractions became
closer together and the pain level intensified (as indicated by
the SF-MPQ scores) women were unable or unwilling to
continue pain assessment. The majority of women ceased
reporting pain scores during stage 1, prior to delivery, due to
their inability to hold a pen or articulate responses. To our
knowledge, repeated assessment of pain during labour has
not previously been reported with the same frequency as was
attempted here. The current data provide a comprehensive
picture of the changes in the intensity and qualities of labour
pain, and indicate that while the protocol was ambitious, the
aims were readily achievable.

According to TQEH procedures for normal delivery,
vaginal examinations are performed on admission, prior to
the administration of analgesia and as required during labour
(The Queen Elizabeth Hospital 1997). All 13 women in the
study had a vaginal examination on admission to the labour
ward and the majority had another to ensure the cervix was
fully dilated. Thus, pain levels in the present study cannot be
correlated to stages of cervical dilatation as in previous
studies [that is stage I defined as 2–4 cm dilatation, stage II as
5–7 cm and stage III as 8–10 cm (Fridh et al. 1988, Gaston-
Johansson et al. 1988, Fridh & Gaston-Johansson 1990)].
Other reports also specify criteria suggesting that only the
first stage of labour (i.e. onset of contractions to full
dilatation of the cervix) was assessed (Nettlebladt et al.
1986, Wuitckik et al. 1990). Regardless, pain scores
increased during the period from onset of contractions to
full cervical dilatation, as with previous reports. Also in line
with past studies, the midwives in the current study were less
capable of assessing the intensity of pain when the mothers
described it as severe.

Interestingly, across all pain levels there was a high
correlation between the mothers’ and midwives’ scores on
both the VAS (r = 0.79) and PPI (r = 0.75). However, further
analysis of the data according to pain levels showed that
midwives underestimate the women’s pain at the upper end
of the intensity scale. The VAS and PPI both measure the
intensity of pain, one using a straight line representing a
continuum of pain and the other a six-point word scale of
increasing intensity from ‘none’ to ‘excruciating’. There are
several possible explanations for the variance between the
mothers’ and midwives’ scores in the severe category. The
mechanisms women use to cope with severe pain may vary
considerably, possibly affecting the outward expression and
making it more difficult for an observer to assess. The
conditions of the study, requiring the researcher to be present
at all times through labour and delivery, in addition to the
knowledge that the midwife was assessing the pain, and that

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**Figure 3** Pain scores recorded by labouring women and midwives, using the Present Pain Intensity Scale of the Short Form McGill Pain Questionnaire. Data are expressed as mean ± SEM for 13 mothers (open bars) and their attendant midwives (shaded bars). Scores were categorized as mild-moderate or severe according to the mothers’ score on the VAS.

**Figure 4** The cues reported by midwives to assess women’s pain during labour. Midwives were asked to rank the cues according to priority based on their own experience. The data represents the percentage of midwives who ranked each cue in the top three positions.
the event was being videotaped (details reported elsewhere, Baker et al. unpublished) may have contributed to the discrepancy between the scores. The extraneous influences may have altered the women’s outward display of pain, making it look to the observer like the pain was less intense than the woman herself described. However, in spite of these possible influences, the results do concur with previous work in the area describing a lack of correlation between mothers’ scores and attendants’ scores when pain levels were severe (Fridh & Gaston-Johansson 1990, Sheiner et al. 2000).

The pain experienced by women in labour varies widely, as does the manner in which women manage and express their pain. The midwives in the current study may have assessed the women’s pain relative to other labours. If previously involved with particularly distressing or traumatic labours, midwives may view average labours as more comfortable, while for the woman it remains one of the most painful experiences of her life (Bradley et al. 1983). It is also debatable whether it is the midwife’s role to assess the pain of the women, or rather to simply respond to the needs and requests of her charge. In a practical sense, the midwife is required to assess the mother’s progress, including her pain, support her decisions and respond to her requests. Thus, it remains the role of the attendant personnel to continuously monitor and help manage the pain of the labouring woman.

The SF-MPQ measures various dimensions of pain. The findings of the current study suggest that the perception of pain may depend on both the quality of pain and the tool utilized. Pain intensity measured by both the VAS and PPI was underestimated by midwives at the severe classification. However, results using the VRS, which describes the sensory and affective qualities of pain, showed that midwives were able to describe pain characteristics and intensity at the severe level but not the mild-moderate level. In addition, the correlation between mothers’ and midwives’ scores was nonexistent for the sensory category but strong for the affective category. The descriptive words used on the SF-MPQ relate to very specific and personal characteristics of pain. The sensory category included words such as throbbing, stabbing and gnawing, characteristics difficult to judge in another person. Thus, it is arguable whether the VRS is a useful tool in the assessment of another’s pain and the intrinsic value of this scale is somewhat questionable. The ability of the midwives to determine a mother’s sensory and affective pain qualities during severe pain but not mild-moderate pain may also reflect the time the woman had been in labour. Research has suggested that the stages and length of labour influence pain intensities and hence the verbal categories used to describe the pain (Niven & Gijsbers 1984a). However, conflicting reports indicate that description of labour pain may not be related to the length of labour (Reading & Cox 1985). Nevertheless, as labour progressed and pain levels reached intensities classified as severe, midwives recorded an increase in the number of words used to describe both the sensory and affective qualities of pain.

Midwives report the common use of nonverbal cues to assess pain in patients. The current results suggest that such cues (e.g. facial expressions and vocalizations) may be consistent with pain intensity at relatively low pain levels but as pain levels increase, corresponding changes in nonverbal cues are insufficient to suggest an increase in pain to the care-giver. Indeed, analysis of facial expressions using a graphics package indicated an inability to discriminate between moderate and severe pain (Baker et al. unpublished). The cues used to determine pain levels by midwives are similar to cues used in other clinical settings. Posture and facial expressions have been used to assess demented or confused patients (Closs 1996) and those suffering myocardial infarction (O’Connor 1995). Alternatively, midwives may not want to acknowledge the intense and severe nature of the pain being experienced due to a reluctance to intervene pharmacologically.

Childbirth is no longer viewed as a life-threatening event in western society. Thus, the display of pain may be in part, influenced by the psychology of a ‘joyful’ event as much as having support from the individuals present during the experience (Copstick et al. 1986, Hofmeyr et al. 1991). It has been suggested that the nurse’s physical presence and caring attitude towards the patient are possibly the most significant aspects of the nurse’s contribution to pain relief (McCaffery 1979). Having decision and behavioural control during the experience of pain is also reported to be an effective form of pain relief (Vallis & Bucher 1986, Weisenberg & Caspi 1989, Rokke & Lall 1992, Walker et al. 1995, Brown & Lumley 1998). Hence, the constant presence of the midwives in the labour suite during the study and the woman’s choice of position and analgesia may have influenced the perception of pain and its subsequent expression.

Conclusion

The present study has shown that pain intensity was greater at the end of labour than at the beginning using the VAS and PPI, and both mothers and midwives reported this change. However, midwives were less able to accurately identify pain levels when the women describe them as severe. Not surprisingly, the nonverbal cues identified by midwives to differentiate pain intensities and qualities are used in other clinical
settings but these cues (facial expression, body movement and vocalizations) may have limited discriminatory ability as pain intensifies over time. Non-verbal cues may be appropriate tools for the assessment of pain, however, action requiring support or pain management may be better mediated by verbal cues. Thus, employment of a combination of both verbal and nonverbal cues by the midwife may be required to ensure that the experience of childbirth remains a positive event.

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References


