Labor Analgesia in South West Nigeria: Methods and Self-reported Effectiveness

Abstract

Context: Labor exposes many women to severe pain. Effective labor pain management is one of the prerequisites for a satisfying labor experience. **Aim:** The aim of this study was to assess the labor pain management practices and patients' assessment of adequacy of pain relief in two tertiary hospitals in South West Nigeria. **Materials and Methods:** This was a cross-sectional study involving 132 pregnant women who had a noninstrumental vaginal delivery at the obstetric units of Babcock University Teaching Hospital and Olabisi Onabanjo University Teaching Hospital, between December 2017 and May 2018. A structured questionnaire was administered to women within 24 h of delivery to record details of labor and delivery, the form of labor analgesia administered and respondents' perceived effectiveness of the analgesia. Data were analyzed using the IBM-SPSS statistics for Windows version 21.0 (IBM, Armonk, New York). **Results:** Sixty-six (50%) women rated labor pain to be severe. Thirty-eight women (28.8%) did not receive any pain relief during labor. Nonpharmacological pain management practices such as back massage, breathing exercises, and companionship were administered to 45(34.1%), 79(59.8%), and 45(34.1%) women, respectively. Nine women (6.8%) received intramuscular pentazocine (30 mg) for labor analgesia. There was a statistically significant association between use of back massage and severe labor pain perception ($\chi^2 = 4.080$; $P = 0.043$). Self-reported effectiveness was highest among users of back massage (82.2%) and companionship (77.8%). **Conclusions:** There is a large unmet need for labor analgesia in South West Nigeria. Nonpharmacological pain management practices were the most frequently used methods, and most patients experienced reduction in severity of pain. There is need for improvements in obstetric analgesia services in our maternity units.

Keywords: *Analgesia, effectiveness, labor pain, obstetric, pain management*

Résumé

Contexte: Le travail expose de nombreuses femmes à des douleurs intenses. Une gestion efficace de la douleur du travail est l'une des conditions préalables à une expérience de travail satisfaisante. **Objectif:** Évaluer les pratiques de gestion de la douleur du travail et l'évaluation par les patientes de l'adéquation du soulagement de la douleur dans deux hôpitaux tertiaires du sud-ouest du Nigéria. **Méthodologie:** Il s'agissait d'une étude transversale portant sur 132 femmes enceintes qui ont eu un accouchement vaginal non instrumental dans les unités d'obstétrique de l'hôpital universitaire de Babcock et de l'hôpital universitaire d'Olabisi Onabanjo, entre décembre 2017 et mai 2018. Un questionnaire structuré a été administré aux femmes dans les 24 heures suivant l'accouchement pour enregistrer les détails du travail et de l'accouchement, la forme d'analgésie du travail administrée et l'efficacité perçue de l'analgésie par les répondantes. Les données ont été analysées à l'aide des statistiques IBM-SPSS pour Windows version 21.0 (IBM Corp., Armonk, NY, USA). **Résultats:** Soixante-six (50%) femmes ont évalué la douleur du travail comme étant sévère. Trente-huit femmes (28,8%) n'ont reçu aucun soulagement de la douleur pendant le travail. Des pratiques de gestion de la douleur non pharmacologiques telles que le massage du dos, les exercices de respiration et la compagnie ont été administrées à 45 (34,1%), 79 (59,8%) et 45 (34,1%) femmes respectivement. Neuf (9) femmes (6,8%) ont reçu de la pentazocine intramusculaire (30 mg) pour l'analgésie du travail. Il y avait une association statistiquement significative entre l'utilisation du massage du dos et la perception d'une douleur intense au travail ($\chi^2 = 4.080$; $P = 0.043$). L'efficacité autodéclarée était la plus élevée parmi les utilisateurs de massage du dos (82,2%) et de compagnie (77,8%). **Conclusions:** Il existe un grand besoin non satisfait d'analgésie du travail dans le sud-ouest du Nigeria. Les pratiques de gestion de la douleur non pharmacologiques étaient les méthodes les plus fréquemment utilisées et la plupart des patients ont connu une réduction de la sévérité de la douleur. Il est nécessaire d'améliorer les services d'analgésie obstétricale dans nos maternités.

Mots-clés: *Analgésie, Efficacité, La douleur du travail, Obstétrique, Gestion de la douleur*

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Introduction

Labor is a painful experience irrespective of social and ethnic backgrounds.[1] With effective labor pain management, it is expected that women will report a more satisfying labor experience. A significant proportion of women will accept some form of labor analgesia.[2] However, the level of analgesia desired may vary; some women just want a reduction in the intensity of labor pain.[3,4] For such women, some degree of pain during labor probably enhances the emotional fulfillment of childbirth.

Several methods are available for the relief of labor pain. These can be broadly divided into pharmacological and nonpharmacological methods.[4] Pharmacological methods of labor analgesia include use of inhalational agents, parenteral opioids, and labor epidural analgesia, whereas nonpharmacological methods include childbirth preparation education, comfort measures and relaxation techniques, breathing exercises, acupuncture, massage, position change, music, transcutaneous electrical nerve stimulation (TENS), and sterile water block.[4,5]

The various labor pain relief methods have varying advantages and disadvantages. The inhalation agent in common use for labor analgesia is entonox, a 50:50 mixture of nitrous oxide and oxygen (N_2O/O_2). Although administration of entonox relieves pain of labor reasonably, it is often associated with varying degrees of sedation.[5] Sevoflurane is another inhalation agent presently being investigated for its usefulness in obstetric analgesia. It is believed to be more effective than entonox but also causes more sedation.[6] Parenteral opioids such as pethidine, pentazocine, fentanyl, morphine, nalbuphine, and more recently remifentanil are also used for relief of labor pain. Parenteral opioids are the most widely used analgesia in labor in Nigeria and are usually administered via intramuscular or intravenous routes.[1] Parenteral opioids provide some relief from pain in labor but are associated with adverse effects such as sedation, feeling of disorientation, nausea, vomiting, maternal and neonatal respiratory depression.[7] Opioids also cause a reduction in baseline variability on the cardiotocograph and can make interpretation difficult. Labor epidural analgesia is the most effective method of labor pain relief in contemporary practice and is currently regarded as the gold standard.[5] Epidural analgesia is however associated with prolongation of second stage of labor and an increased risk of instrumental vaginal delivery.[5]

Although pharmacological methods of labor analgesia generally aim at relieving pain, the nonphamacological methods help women to better cope with labor pain.[8] Some of these methods have been evaluated scientifically for their effectiveness in reducing labor pain. Studies have shown that companionship in labor is associated with a decrease in request for pain medication, including epidural analgesia.[9] There is also a suggestion that reassuring touch, aromatherapy, and massage during labor may relieve pain or serve as adjuncts to other methods of labor analgesia.[5]

There are no organized labor analgesia services in most hospitals in Nigeria.[1] The usual practice is either complete absence of labor analgesia or at best occasional use of parenteral opioids,[10] hence there still remains a large unmet need of obstetric analgesia. This study assessed the labor pain management practices in two tertiary hospitals in south west Nigeria.

Materials and Methods

This was an observational cross-sectional study conducted at the obstetric units of Babcock University Teaching Hospital (BUTH) and Olabisi Onabanjo University Teaching Hospital (OOUTH). BUTH is a private tertiary hospital located in Ilishan-Remo, Ogun State, Nigeria, whereas OOUTH is a State government-owned tertiary hospital located in Sagamu, Ogun State, Nigeria. The patients who receive care in these hospitals are of mixed ethnic and socioeconomic background.

Ethical approval for the study was obtained from Babcock University Health Research Ethics Committee (BUHREC). The research was conducted in accordance with the World Medical Association Declaration of Helsinki. All study participants were given full information on all aspects of the study and then asked to sign an informed consent form. The study participants were assured of the confidentiality of data obtained from them.

The target population for the study were all pregnant women admitted for vaginal delivery at the labor wards of BUTH and OOUTH between December 2017 and May 2018.

The minimum sample size required for the study was estimated using the formula for determining sample size in a descriptive study designed to estimate mean:[11]

$$n = \frac{4\sigma^2 (Z)^2}{D^2}$$

where *n* is the sample size, σ is the assumed standard deviation for the group, *Z* is the standard normal deviate set at 1.96 (for 95% confidence interval), and *D* is the total width of the expected confidence interval.

In a similar study[10] on perception of labor pain carried out in Enugu, South-East Nigeria, it was found that on a scale of 0 to 10, with 0 representing no pain and 10 representing maximal pain, the mean intensity of pain recorded by the respondents was 7.7 ± 2.8, that is, σ = 2.8. Assuming the limits of the 95% confidence interval is no more than 0.5 above or 0.5 below the mean intensity of pain score, *D* = 1.

Therefore, $n = 4 \times 2.8^2 \times 1.96^2 / 1 = 120$. Adjustment for a 10% rate of invalid or erroneous entries yielded a final sample size of 132.

The inclusion criteria for the study consisted of women who had noninstrumental vaginal delivery at BUTH and OOUTH and gave consent to participate in the study. Women who had instrumental vaginal delivery, women who were delivered by

caesarean section, women with associated medical problems like hypertension, diabetes and sickle cell disease, women with pregnancy complications such as abruptio placentae, placenta praevia, and women who refused to give written informed consent were excluded from the study.

Sixty-six women were recruited from each of the study centres. These eligible women were recruited consecutively until the estimated sample size was obtained. Women who matched the inclusion criteria were approached within the first 24hrs of delivery and given verbal and written explanation of the study and invited to participate. For those willing to participate, written informed consent was obtained.

The instrument of data collection was a structured questionnaire that was developed for the study. The questionnaire was administered to the subjects within 24hours of delivery. The questionnaire was in two parts. The first part was used to obtain demographic characteristics such as age, occupation, husband's occupation, booking status, religion, tribe, educational attainment, parity, and body mass index (BMI). This information was obtained through a review of the parturient's case file. Data on labor characteristics such as its nature and gestational age of onset, use of oxytocin for augmentation, use of episiotomy, birth weight and APGAR scores were also recorded.

The second part of the questionnaire was used to obtain information on the pain management modalities offered to parturients and the reported effectiveness of such modalities. This information on the pain management modalities was retrieved from the labor records of each parturient. The women were then interviewed to determine the perceived intensity of labor pain using the visual analog scale (VAS). The VAS is a 10 cm line that is labeled "no pain" at the zero end and "the worst pain possible" at the 10 cm end. Each subject was asked to indicate on the scale the point corresponding to her perception of the intensity of labor pain. The VAS had been validated as a useful tool in assessment of pain in Nigerian patients.[12] The VAS score was used to categorize pain as either mild (≤3.0), moderate (3.1–7.0) or severe (7.1–10.0) based on a previous definition.[12] The effectiveness of each pain relief method was assessed by asking the parturients whether the specific method had any effect on their pain, when such method was administered. The parturients were also asked about their desire for modern modalities for labor analgesia. Anonymity and confidentiality of data were assured by noninclusion of patient identifiers in the questionnaires.

Statistical analysis

Data were analyzed using the IBM-SPSS statistics for Windows version 21.0 (IBM, Armonk, New York). Categorical variables were summarized using frequencies and percentages, whereas continuous variables were summarized using descriptive statistics such as mean and standard deviation. The association between severity of labor pain perception and the pain relief method administered was assessed using chi-square test. A value of $P < 0.05$ was considered statistically significant.

Results

The mean age of the respondents was 30.6(SD 4.8) years with a range of 19–44 years. The median and modal parity was 1, with parity range of 0–7. The socio-demographic characteristics of respondents are presented in Table 1. Majority of the respondents, 104 (78.8%) were of Yoruba ethnicity and 79(59.8%) had had tertiary level of education. Sixty-six (50%) of respondents rated labor pain to be severe, 64(48.5%) rated it moderate, whereas two (1.5%) rated it as mild. Ninety-four women (71.2%) used some method of labor analgesia, whereas 38 (28.8%) did not use any pain relief method. The various labor pain relief methods administered on the parturients and their self-reported effectiveness are displayed in Table 2. Majority of the women in this study used various combinations of non-pharmacological methods of pain relief namely breathing exercises used by 79(59.8%), back massage 45(34.1%), and companionship 45(34.1%). Nine women (6.8%) had pharmacological pain relief with intramuscular pentazocine (30 mg, repeated after four hours). Back massage had the highest proportion of women with self-reported reduction in labor pain (82.2%), followed by companionship (77.8%), breathing exercises (72.2%), and intramuscular pentazocine (44.4%).

Table 3 shows the association between the severity of labor pain perception and the pain relief method. There was a statistically significant association between use of back massage and severe labor pain perception ($\square^2$=4.080; $P = 0.04$). However, there was no significant association between use of breathing exercises, companionship and intramuscular pentazocine, and severe labor pain perception ($P = 0.59$, $P = 0.36$ and $P = 0.30$, respectively).

The methods of labor analgesia desired by parturients are shown in Table 4. Only two parturients (1.5%) expressed desire for use of inhalational agents for labor analgesia. Thirty parturients (22.7%) would prefer epidural analgesia, 25(18.9%) would prefer parenteral opioids, 57(43.2%) would accept any effective method. Eighteen parturients (13.6%) were not desirous of any modality for labor analgesia.

Discussion

Labor pain is an intricate part of the childbirth experience, and it is the duty of health care professionals to ensure that this experience is not only safe but also satisfying. This study has shown that labor pain management practices at the two institutions were mostly by non-pharmacological methods with breathing exercises being the commonest practice and back massage the most effective.

Half of the women studied reported labor pain to be severe, this is similar to reports from a study done in Ebonyi state, Nigeria.[13] Despite reporting labor pain as severe, 28% of women studied went through labor without any form of

analgesia. Other studies report similar findings indicating poor utilization of obstetric analgesia services by Nigerian women.[1,10] Modern methods of obstetric analgesia are often not available in many obstetric units in Nigeria; hence many centers depend on non-pharmacological methods. In this study, less than 10% of the women had parenteral opioids (intramuscular pentazocine, 30 mg), whereas none of them was offered inhalational analgesia or labor epidural analgesia. This indicates a high unmet need for obstetric analgesia. It is important to note that this study was carried out in two tertiary hospitals; both having the necessary facilities and manpower to institute modern methods of obstetric analgesia. One of the major reasons adduced for the poor obstetric analgesia services in developing countries is the attitude and behavior of health care professionals.[14] Health care professionals may be concerned about the effect of pain relief on the baby, mother, and the labor process.[14] Some may also perceive labor pain as normal and encourage women to bear the pain.[15] This may be

the case in many health facilities in Nigeria. A study carried out in Ibadan, Nigeria reported that misconceptions of some health workers regarding labor pain relief negatively influenced the management of labor pain.[16] Health care professionals must ensure that their personal beliefs and attitudes do not act as barriers to parturients' uptake of labor analgesia, rather they should ensure that they support women in their choices for labor pain management.[17] Another often stated barrier to use of modern obstetric analgesia services is high cost. The incorporation of obstetric analgesia services into a functional comprehensive health insurance scheme will likely assist in mitigating this challenge.

Nonpharmacological methods of obstetric analgesia have the advantage of being cheap, easy to use, have minimal side effects and increase women's participation in making decisions about their management.[4,8] These methods may reduce the physical sensations of, and emotional responses to pain, thus assisting women to better cope with labor pain.[4,18] Breathing exercise was the most commonly used non-pharmacological modality for pain relief. Midwives often encourage parturients to breathe deeply through the mouth during painful contractions. It is believed that this may divert the attention of women from labor pain thus enabling them to better cope with it.[15]

In this study, there was a statistically significant association between use of back massage and severe labor pain perception. However, back massage was also noted to be the most effective method of labor analgesia. Over 80% of women who used back massage reported reduction in their perception of labor pain. Other studies have indicated the usefulness of back massage in reducing labor pain intensity or reducing the need for pain medications during labor.[19,20] Reports from a systematic review also suggest that back massage reduced pain in all stages of labor.[21] Companionship had the second-highest self-reported effectiveness in relieving labor pain. Birth companions known as doulas can provide continuous support for women in labor by encouraging them and showing empathy. Studies have shown that parturients who had doulas had lower pain scores than those without doulas.[22] There is also evidence to suggest that use of doulas leads to significant reduction in demand for epidurals and delay in their use.[9] Training these doulas to provide both companionship and back massage to parturients may likely improve their labor experience.

Over 80% of women studied desired modern methods of labor analgesia; many of these women had no specific preference but wanted any effective method. Considering the high demand for effective labor analgesia, health care professionals should work

Table 1: Sociodemographic characteristics of respondents

Parameter	Frequency	%
Age (years)		
<20	1	0.8
20–24	8	6.1
25–29	51	38.6
30–34	41	31.0
≥35	31	23.5
Parity		
0	37	28.0
1–2	73	55.3
3–4	17	12.9
≥5	5	3.8
Level of education		
No formal education	7	5.3
Primary	5	3.8
Secondary	41	31.1
Tertiary	79	59.8
Occupation		
Unemployed	9	6.8
Artisan	18	13.6
Trader	47	35.6
Civil Servant	45	34.1
Professional	4	3.0
Others	9	6.8
Ethnicity		
Yoruba	104	78.8
Igbo	20	15.2
Others	8	6.1
Religion		
Christianity	91	68.9
Islam	39	29.5
Traditional worship	2	1.5

Table 2: Pain relief methods and their self-reported effectiveness

Pain relief methods	No effect *n* (%)	Reduced pain *n* (%)	Total
Back massage*	8(17.8)	37(82.2)	45
Breathing exercises	22(27.8)	57(72.2)	79
Companionship	10(22.2)	35(77.8)	45
Intramuscular Pentazocine	5(55.6)	4(44.4)	9

*Women who requested for back massage from their companions

Table 3: Association between severity of labor pain perception and pain relief method

Pain relief method	Severe pain perception	Non-severe pain perception	χ^2	*P* Value
Back massage				
Yes	28(62.2)	17(37.8)	4.080	0.043
No	38(43.7)	49(56.3)		
Breathing exercise				
Yes	41(51.9)	38(48.1)	0.284	0.59
No	25(47.2)	28(52.8)		
Companionship				
Yes	25(55.6)	20(44.4)	0.843	0.36
No	41(47.1)	46(52.9)		
Intramuscular Pentazocine				
Yes	6(66.7)	3(33.3)	1.073	0.30
No	60(48.8)	63(51.2)		

Table 4: Methods of labor analgesia desired by parturients

Pain relief method	Number desiring method	Percentage
Inhalational agents	2	1.5
Epidural analgesia	30	22.7
Parenteral opioids	25	18.9
Any effective method	57	43.2
Not desirous of labor analgesia	18	13.6

towards developing protocols for obstetric analgesia services in our obstetric units.

Limitation of the study

This study did not assess the parturients' level of knowledge about modern methods of obstetric analgesia. Poor knowledge of these methods may be responsible for the large number of women who had no specific preference. The study was carried out in two tertiary health facilities located in semi-urban areas; it is possible that the knowledge of and demand for obstetric analgesia may be different in other settings. Also the findings of study may not be reflective of what obtains in other lower level health facilities.

Conclusion

There is a large unmet need for labor analgesia in South West Nigeria. Labor pain management in this region commonly involves use of non-pharmacological methods with only occasional use of pain medications. Provision of effective obstetric analgesia services in our maternity units would ensure a satisfying childbirth experience.

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Conflicts of interest

There are no conflicts of interest.

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