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## Evaluation of Oral Ketamine for Pain Relief During Perineal Repair in Postpartum Women South-East Nigeria

Authors

**Okorie O<sup>1</sup>, Babah OA<sup>2</sup>**

<sup>1</sup>Department of Anaesthesia, Federal Medical Centre, P.M.B.1010 Owerri  
Nigeria

E-mail: drogeokorie4@yahoo.com

<sup>2</sup>Department of Obstetrics and Gynecology, Flokel Specialist Hospital, Isolo, Lagos  
Nigeria.

Email: ochuwab@yahoo.co.uk

Corresponding Author

**Dr O. Okorie**

Department of Anaesthesia

Federal Medical Centre, Owerri, Nigeria

Email: drogeokorie4@yahoo.com

Phone: +2347030988644

### Abstract

**Background:** We evaluated the efficacy of oral Ketamine for pain relief during perineal repairs in postpartum women with episiotomies, perineal tears and cervical laceration.

**Method:** A prospective, non-placebo, single blind randomised study was carried out. Two hundred and seventy three (273) booked parturients in active phase of labour were randomly assigned to three treatment groups (A-C). The dosages of oral Ketamine that they received were as follows: Group A- 4 mgkg<sup>-1</sup>; group B- 5 mgkg<sup>-1</sup>; and group C- 6 mgkg<sup>-1</sup>. Of the 273 parturients that received the oral ketamine, 111 of the parturients had perineal laceration and/or episiotomy. The efficacy of the drug for suturing episiotomy and vaginal laceration was determined by suturing without infiltration of local anaesthetic (Lidocaine) and assessed for pain using pain assessment tools (visual analogue scale, VAS and verbal rating scale, VRS). Patients with VAS  $\geq 3$  and VRS  $\geq 3$  were infiltrated with 2% Lidocaine with adrenaline (1-7mgkg<sup>-1</sup> as rescue

*analgesia during episiotomy and vaginal laceration repair.*

**Result:** *The proportion of women who reported satisfaction to varying degrees during repair of their perineal laceration and/or episiotomy was 66.7% in group A, 42.9% in group B, and none in group C. Rescue analgesia was required in 92.3% of patients in group A, 90.5% for those in group B and 58.3% for those in group C*

**Conclusion:** *The higher the dose the better the analgesia during the perineal repairs. However the dosage should be adjusted such as to minimize the incidence of side effects and improve patient's satisfaction. Probably if the half dose of oral Ketamine that gave maximum satisfaction ( $4\text{mgKg}^{-1}$ ) is given 15 minutes before the procedure, then this might minimize the need for rescue analgesia. This however calls for further studies.*

**Key words:** *Analgesia, Efficacy, Oral Ketamine, Perineal laceration*

## INTRODUCTION

Perineal pain from a tear and/or surgical cut (episiotomy) is a common problem following vaginal birth. Strategies to reduce perineal trauma and the appropriate repair of any perineal damage sustained are important for avoiding and alleviating pain. Where pain is present, numerous treatments are used in clinical practice, such as local anaesthetics, oral analgesics, therapeutic ultrasound, antiseptics and non-pharmacological applications such as ice packs and baths.<sup>1</sup> Perineal trauma contributes to longer term morbidity following childbirth.<sup>2</sup>

In the developing countries such as Sub-Saharan Africa the main method of providing analgesia is by infiltration of local anaesthetics before suturing the episiotomy or cervical laceration. The

analgesic effects derived from these may be suboptimal especially when the infiltration is inadequate or not properly done. A common observation in clinical practice is that most often parturients tend to feel pain during the repair of the perineal skin as infiltration of this thin layer with local anaesthetic is often sub-optimal, more so parturients are often tense and anxious as a result of multiple needle pricks when the local infiltration with anaesthetic agent is being conducted. The use of non steroidal anti-inflammatory drugs per os that has been advocated is mainly for the control of pain during the first few days postpartum but not to provide analgesia during suturing of perineal tear.<sup>3,4</sup>

Ketamine a phencyclidine, non narcotic, non barbiturate drug capable of producing analgesia

and anaesthesia.<sup>5</sup> Ketamine can be given through intravascular (IV), intramuscular (IM), subcutaneous (SC), orally, intrathecal (IT), rectal, nasal and epidural routes.<sup>6</sup> Oral Ketamine was used to evaluate pain relief during normal labour and it was found that it can be used for labour analgesia<sup>7</sup>, the aim of this study is to evaluate the administration of oral Ketamine during active phase of labour and assess the efficacy of its extended use in the repair of the perineum of patients that either have perineal lacerations or surgical tears (episiotomy).

## PATIENTS AND METHODS

This study was a prospective non-placebo, single blind randomised study conducted from January 2008 to December 2008. It was a comparative study of three different doses of oral ketamine, carried out among booked pregnant women selected for vaginal delivery by their managing obstetric teams over a period of one year at the Ebonyi State University Teaching Hospital, Abakaliki.

Approval by the Research and Ethics Committee of the Ebonyi State University Teaching Hospital, Abakaliki and informed consent of each patient were obtained.

All consenting booked pregnant women whose foetuses presented normally (i.e. lying longitudinally with cephalic presentation) were included in the study.

Exclusion criteria included trial of labour, scarred uterus, and any of the following conditions: hypertension, preeclampsia/eclampsia, cardiac

disease, liver disease, malpresentation, multiple pregnancies, history of neuropsychiatric disorders, preterm labour, precious baby and patients with any contraindication for vaginal delivery. A minimum sample size of 273 subjects was calculated using Fisher's formula.<sup>8</sup> There were three treatment groups and ninety one participants were enrolled for each group (Group A = 4mgml<sup>-1</sup>, B = 5mgml<sup>-1</sup>, C = 6mgml<sup>-1</sup>). Out of the 273 parturients, 111 had either perineal lacerations or episiotomy. The efficacy of the drug for suturing episiotomy and vaginal laceration was determined by suturing without infiltration of local anaesthetic (Lidocaine) and assessed for pain using pain assessment tools (visual analogue scale, VAS and verbal rating scale, VRS). Patients with VAS  $\geq 3$  and VRS  $\geq 3$  were infiltrated with 2% Lidocaine with adrenaline (1-7mgkg<sup>-1</sup> as rescue analgesia during episiotomy and vaginal laceration repair.

## RESULTS

The demographic characteristics of the study population are shown on Table 1. There were no significant differences in the age, weight, height and BMI. The age of patients ranged from 21 to 40 years with a mean of (mean  $\pm$  SD) 36.6  $\pm$  9.4 years. Weight ranged between 52kg and 100kg with a mean of 69.6  $\pm$  11.7kg, and a mean height of 1.64  $\pm$  0.07m. Mean body mass index is 25.9  $\pm$  4.4kgm<sup>-2</sup>.

Rescue analgesia was required in 92.3% of patients in group A, 90.5% for those in group B and 58.3% for those in group C, Table 2.

In group A (4mgkg<sup>-1</sup>) 4 (7.4%) patients were very dissatisfied, 2 (3.7%) patients were dissatisfied, 12 (22.2%) patients were slightly dissatisfied and slightly satisfied respectively, 15 (27.8%) patients

were satisfied and 9 (16.7%) patients were very satisfied.

In group B (5mgkg<sup>-1</sup>) satisfaction with analgesia for the repair appears poor as shown in table 3.

In group C (6mgkg<sup>-1</sup>) satisfaction with analgesia for the repair also appears poor.

**Table 1: Comparison of demographic characteristics**

Groups	A	B	C	Total	P-value	Significance
	n=91	n=91	n=91	273		
Age (yr) mean/SD	35.3(±10.1)	37.9(±8.2)	36.7(±9.8)	36.6(±9.4)	0.611	Not significant
Weight (kg) mean/SD	68.2(±12.7)	70.6(±10.6)	70.0(±11.7)	69.6(±11.7)	0.372	Not significant
Height (m) mean/SD	1.65 (±0.7)	1.63(±0.06)	1.64(±0.07)	1.64(±0.07)	0.142	Not significant
BMI (kgm <sup>-2</sup> ) mean/SD	25.1(±5.2)	26.5(±3.6)	26.1(±4.2)	25.9(±4.4)	0.115	Not significant

**Table2: Relationship between the doses of Ketamine and rescue analgesia for episiotomy/ vaginal laceration repair.**

t	Dosage	Any rescue Analgesia for Episiotomy/vaginal laceration repair			P-value	Significance
		Yes	No	Total		
A	4mg/kg	52	2	54		Significant
		92.3%	3.7%	100.0%		
B	5mg/kg	19	2	21	0.000	
		90.5%	9.5%	100.0%		
C	6mg/kg	21	15	36		
		58.3%	41.7%	100.0%		
Total	Total	92	19	111		
		82.9%	17.1%	100.0%		
		100.0%	100.0%	100.0%		

**Table 3: The relationship between the different doses of oral ketamine and patients' satisfaction for episiotomy and vaginal repair**

Group	Dosage mgKg <sup>-1</sup>	Patient's Satisfaction for Episiotomy/ Vaginal laceration repair							P-value
		Very dissatisfied	Dissatisfied	Slightly dissatisfied	Slightly satisfied	Satisfied	Very satisfied	Total	
A	4mgkg <sup>-1</sup>	4 7.4%	2 3.7%	12 22.2%	12 22.2%	15 27.8%	9 16.7%	54 100.0%	0.000*
B	5mgkg <sup>-1</sup>	6 28.5%	3 14.3%	3 14.3%	3 14.3%	3 14.3%	3 14.3%	21 100.0%	
C	6mgkg <sup>-1</sup>	0 .0%	12 33.3%	24 66.7%	0 .0%	0 .0%	0 .0%	36 100.0%	
	Total	10 9%	17 15.3%	39 35.3%	15 13.5%	18 16.2%	12 10.8%	111 100.0%	

\* Significant

## DISCUSSION

Pain is an unpleasant experience which is often undesirable in clinical practice and modern day obstetrics. Perineal tears and episiotomies are forms of injuries which are associated with much pain. In many settings especially low resource settings like ours, the cut (episiotomy) is often inflicted by the accoucher without prior analgesia and the need for analgesia becomes evident only during the repair process.

Oral Ketamine which we have studied here, is easy to administer as skill is not required to do so. Moreso, it is tasteless and odourless and thus tolerable to the patients. It has been established in earlier studies that oral Ketamine is a good labour analgesia. This study showed that 66.7% of women who had oral Ketamine at a dose of 4mgkg<sup>-1</sup> reported satisfaction to varying degrees during repair of their perineal laceration and/or

episiotomy; while 42.9% were satisfied with a dose of 5mgkg<sup>-1</sup>; and none of those who had 6mgkg<sup>-1</sup> of oral Ketamine was satisfied. This is probably due to the incidence of side effects with higher doses of Ketamine as was reported in an earlier study by Okorie O et al; the commonest side effects reported being dizziness, nausea and vomiting, sedation, nystagmus, hallucinations, hypersalivation and headaches.<sup>7</sup>

However we found that the need for rescue analgesia was lower when higher doses of oral Ketamine is administered. There is thus a need to balance the analgesic benefit of Ketamine with the side effects in order to achieve maximum satisfaction with minimal side effects. Probably if half the dose of oral Ketamine that gave maximum satisfaction (4mgKg<sup>-1</sup>) is given 15 minutes before the procedure, then this might

minimize the need for rescue analgesia. This however calls for further studies.

Since this study has shown oral Ketamine to be a good analgesia for repair of perineal injuries, we recommend its use in Obstetrics. Moreso, considering the fact that once administered in labour, there may be no need for additional analgesia before or after any episiotomy and perineal repairs can be undertaken immediately after delivery of baby and placenta.

## CONCLUSION

This study has shown oral Ketamine to be a good analgesia for repair of perineal injuries. The higher the dose of oral Ketamine administered, the better the analgesia during the perineal repairs. However the dosage should be adjusted such as to minimize the incidence of side effects and improve patient's satisfaction. Probably if half the dose of oral Ketamine that gave maximum satisfaction ( $4\text{mgKg}^{-1}$ ) is given 15 minutes before the procedure, then this might minimize the need for rescue analgesia. This however calls for further studies.

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