

International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622
© Gynaecology Journal
www.gynaecologyjournal.com
2023; 7(2): 141-145
Received: 07-01-2023
Accepted: 12-02-2022

Dr. Sushmitha
Final Year Post Graduate,
Department of Obstetrics and
Gynaecology, Rajah Muthiah
Medical College, Annamalai
University, Chidambaram, Tamil
Nadu, India

Dr. K Latha
Professor, Department of
Obstetrics and Gynaecology, Rajah
Muthiah Medical College,
Annamalai University,
Chidambaram, Tamil Nadu, India

Dr. Vanathi
Assistant Professor, Department of
Obstetrics and Gynaecology, Rajah
Muthiah Medical College,
Annamalai University,
Chidambaram, Tamil Nadu, India

Corresponding Author:
Dr. K Latha
Professor, Department of
Obstetrics and Gynaecology, Rajah
Muthiah Medical College,
Annamalai University,
Chidambaram, Tamil Nadu, India

A comparative study of tumescent anaesthesia (0.1% lignocaine with adrenaline) versus 2% lignocaine for episiotomy

Dr. Sushmitha, Dr. K Latha and Dr. Vanathi

DOI: <https://doi.org/10.33545/gynae.2023.v7.i2c.1297>

Abstract

Introduction: Tumescent anaesthesia is a practice of giving a very dilute form of local anaesthesia drug combined with epinephrine to a tissue till the tissue becomes firm and tense (tumescent). Delivery is a physiological procedure associated with great pain, which is in turn added by the episiotomy procedure. Advantage of using tumescent anaesthesia as a local anaesthetic agent include that it reduces the blood loss by both epinephrine induced vasoconstriction and hydrostatic compression from the tumescent effect. Tumescent lignocaine absorbed slowly from subcutaneous tissue that produces lower & more delayed peak serum levels and also extended analgesic effect after procedure.

Aim and Objectives: To compare the effects of tumescent anaesthesia over 2% lignocaine for episiotomy in patients delivering via labour natural in Rajah Muthiah Medical College and Hospital, Chidambaram. To study the effectiveness of tumescent anaesthesia in decreasing blood loss at episiotomy site. To study the effectiveness of tumescent anaesthesia in reducing pain and prolonging the analgesic effect. To study the effectiveness of tumescent anaesthesia aiding in demarcation of layers of episiotomy wound while repairing.

Materials and Methods: To the patients who progress for vaginal delivery in stage two of labour before crowning of fetal head 10 ml of 2% lignocaine and 10 ml of tumescent anaesthesia [0.1% lignocaine with adrenaline) to be instilled into the perineal skin at the episiotomy site left mediolateral (By randomised selection of patients). When fetal head crowns episiotomy to be given and baby to be delivered. After removal of the placenta, episiotomy wound will be sutured in layers.

Results: The mean Duration of analgesia in Group A was 93.467 ± 17.4529 & group B was 198.100 ± 12.0669 with P value less than 0.05, which was statistically significant. The mean time of suturing episiotomy in group A was 22.19 ± 1.642 and group B was 12.45 ± 1.947 with P value <0.05 , which was statistically significant.

Conclusion: The inference of the study shows that tumescent anaesthesia (0.1% lignocaine with adrenaline) has certain benefits when used as local anaesthesia for doing and repairing episiotomy when compared to 2% lignocaine in terms of prolonging duration of analgesia, reducing the time taken to suture episiotomy wound by demarcating the tissues which aids in easy suturing.

Keywords: Tumescent anaesthesia, episiotomy

Introduction

Tumescent anaesthesia is a practice of giving a very dilute form of local anaesthesia drug combined with epinephrine to a tissue till the tissue becomes firm and tense (tumescent). Delivery is a physiological procedure associated with great pain, which is in turn added by the episiotomy procedure^[1].

Advantage of using tumescent anaesthesia as a local anaesthetic agent include that it reduces the blood loss by both epinephrine induced vasoconstriction and hydrostatic compression from the tumescent effect. Tumescent lignocaine absorbed slowly from subcutaneous tissue that produces lower & more delayed peak serum levels and also increased analgesic effect after procedure^[2].

Episiotomy is the most frequent obstetric procedure done to expand the introitus to enhance safe vaginal delivery. Because of distressing perineal pain, mother finds difficulty in sitting, walking and also breast feeding. Conventionally lignocaine infiltration has been used before performing episiotomy but its shorter duration of action may lead to early analgesic intervention^[3].

While adding epinephrine and lignocaine (Tumescent anaesthesia) will provide extended analgesic effect. The tumescent effect on the tissue helps in demarcation of the mucosa and muscle which helps in episiotomy repairing^[4].

Materials and Methods

Study Design: A Prospective Study.

Study Setting: Labour ward, Rajah Muthiah Medical College and Hospital, Chidambaram.

Study Period: November 2020 to October 2022 (2 years).

Sample Size: 60 (30 patients receive 2% Lignocaine & 30 patients receive Tumescant Anaesthesia.

Inclusion criteria

- Maternal age >18 years of age
- Vaginal delivery
- No known allergy to lignocaine

Exclusion criteria

- Known hypersensitivity to lignocaine.

Method of study

After approval from the institutional ethical committee, all antenatal mothers who progress for vaginal delivery will be included in the study.

Relevant details will be collected from antenatal patients which include details like their age, address, socioeconomic and educational status, past medical history (any drug allergies).

To the patients who progress for vaginal delivery in stage two of labour before crowning of fetal head 10 ml of 2% lignocaine and 10 ml of tumescant anaesthesia [0.1% lignocaine with adrenaline) to be instilled into the perineal skin at the episiotomy site left mediolateral (By randomised selection of patients). When fetal head crowns episiotomy to be given and baby to be delivered. After removal of the placenta, episiotomy wound will be sutured in layers.

During the procedure of doing and repairing episiotomy with the above two mentioned local anaesthetic agents, maternal pain, bleeding from local site, maternal Cooperation for episiotomy repair and analgesic effects of the agents during post natal period along with the maternal comforts will be studied.

Parameters studied

1. Duration of Analgesia
2. Duration for suturing episiotomy

Administration

Different routes of administration utilize different preparations of lignocaine. Very dilute concentrations, 0.05 to 0.1%, could be infiltrated subcutaneously in more volumes to provide tumescant local anesthesia, resulting in swelling and firmness of the site, which may be useful for certain surgical procedures. Dilute solutions 0.25 to 0.5% can be used for intravenous regional anesthesia or infiltration into the subcutaneous tissue.

1 to 2% solutions can be used for regional nerve block, including epidural anaesthesia, and also available in intravenous preparations for antiarrhythmic use.

1 to 2% aqueous gels, including an antiseptic like chlorhexidine, can be used to lubricate the urethra prior to procedures like Foley's catheterization.

4% solution used for topical application on the mucous membranes of the airway, including the pharynx, mouth, and respiratory tract, either by gargling, spraying or by atomizer.

5% ointment mixed with hydrocortisone, is used topically on other mucous membranes such as the skin or rectum.

10% solution is also used for airway anaesthesia, by spraying by

a metered-dose atomizer.

Contraindications

The drug is contraindicated in patients with a known adverse reaction. Methemoglobinemia can occur due to lignocaine metabolism to O-toluidine. This metabolite will be present if high doses are used, but it can also happen with lesser doses when the patient is using other drugs that can precipitate methemoglobinemia or when the patient has hemoglobinopathy or other causes of anemia.

Lignocaine should not be used as an antiarrhythmic when dysrhythmia can be secondary to local anaesthetic toxicity.

Lignocaine preparations having epinephrine cause significant cardiovascular side effects even if only given in less amounts, and it is necessary for essential hemodynamic monitoring before and during use solution containing vasopressors, specifically if there is any specific issue with the patient's cardiovascular status.

Monitoring

Lignocaine has a very narrow therapeutic index and so plasma level monitoring might be needed for patients with hepatic dysfunction who are in prolonged infusions. Ideal weight should be used instead of actual weight of patient for dose calculations to prevent very high plasma concentrations (with an absolute higher limit of 120 mg/h for lignocaine infusion).

Statistical analysis

The data collected were entered into Microsoft excel 360 in order to create a master chart. The master chart was then loaded into statistical package for social sciences (SPSS) version 26 for further statistical analysis. Both quantitative and qualitative variables were present in the master chart. Both descriptive and inferential statistics were used for analysis.

For describing the qualitative variables, frequency and percentages were used. For describing the quantitative data, mean and standard deviation were used. In order to find out difference in distribution of qualitative variable between the experimental arms, chi-square test was applied. To find out the difference in mean between two groups, independent samples T test was applied. To find out the difference in change of mean between the groups for a repeatedly measured variables, Repeated measures analysis of variance (RM-ANOVA) was used. A P value of less than 0.05 was considered to be statistically significant.

Results

The mean age in group A was 28.06 years and group B was 26.32 years. The mean height in group A was 160.52cm and group B was 161.68 cm. The mean weight in group A was 77.23 kgs and group B was 64.32 kgs. The baseline characteristics like age, height, weight and parity in both groups were similar. The study includes primi and second gravida in both groups. There was no statistical difference between group A and group B with respect to distribution of parity.

The mean Duration of analgesia in Group A was 93.467 ± 17.4529 & group B was 198.100 ± 12.0669 with P value less than 0.05, which was statistically significant. The mean time of suturing episiotomy in group A was 22.19 ± 1.642 and group B was 12.45 ± 1.947 with P value <0.05, which was statistically significant.

Table 1: Comparison of mean time for suturing episiotomy between group A and group B

	Group A		Group B		P
	Mean	Std. Deviation	Mean	Std. Deviation	
Time for Suturing Minutes	22.19	1.642	12.45	1.947	0.000

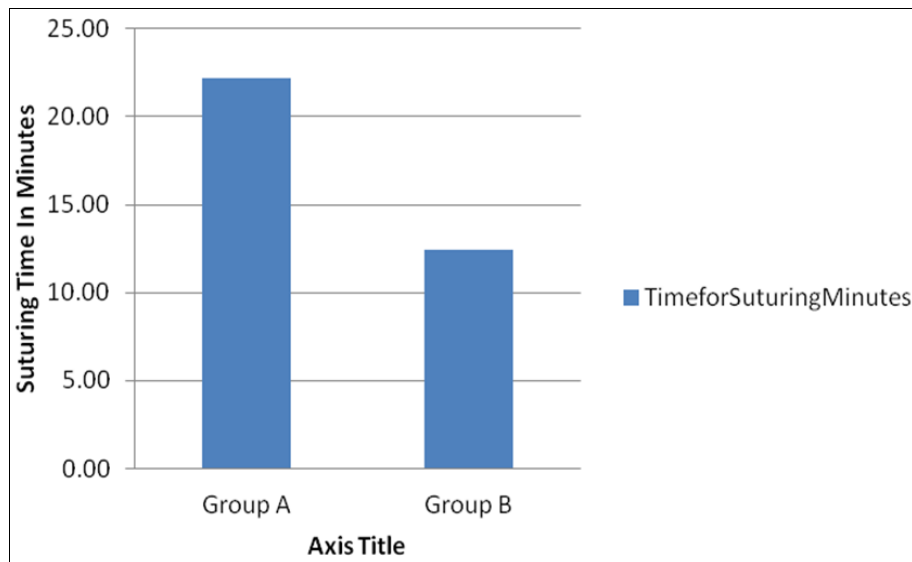


Fig 1: Bar diagram of comparison of mean time for suturing episiotomy between group A and group B

The mean time of suturing episiotomy in group A is 22.19 ± 1.642 and in group B is 12.45 ± 1.947 . The mean time of suturing episiotomy in group A is more than group B with P value <0.05 .

Table 2: Comparison of mean duration of analgesia between group A and group B

	Group Statistics				
	V1	N	Mean	Std. Deviation	P value
	Analgesic Effects Minutes	Group A	30	93.467	17.4529
	Group B	30	198.100	12.0669	

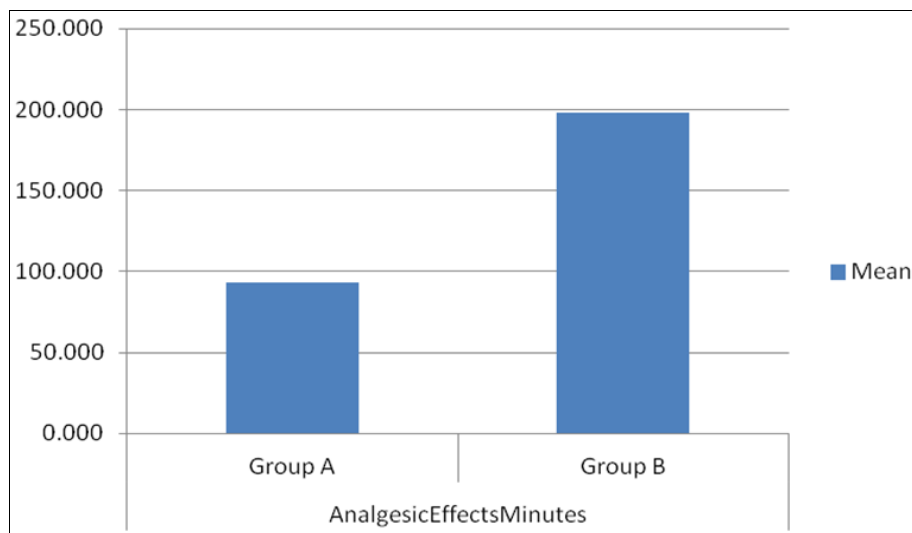


Fig 2: Bar diagram showing comparison of mean duration of analgesia between group A and group B

The mean duration of analgesia in Group A is 93.467 ± 17.4529 and in group B is 198.100 ± 12.0669 . The mean duration of analgesia is more in Group B than Group A with P value less than 0.05.

Discussion

Labour is defined as a series of events that includes regular and painful uterine contractions that cause progressive dilatation and effacement of the cervix that leads to delivery of the fetus. During mechanism of labour, a procedure called episiotomy is

done which facilitates delivery of the metal head and prevents perineal laceration. Without local anaesthesia, the procedure of giving and repairing episiotomy is very painful [5].

This study was conducted in Government Cuddalore Medical College and Hospital to study on benefit of tumescent anaesthesia (0.1% lignocaine with adrenaline) over 2% lignocaine for episiotomy.

30 patients received 2% lignocaine as local anaesthesia before giving episiotomy and 30 patients received 0.1% lignocaine

mixed with adrenaline.

Group A - Set of patients who received 2% lignocaine as local anaesthesia.

Group B - Set of patient who received 0.1% lignocaine with adrenaline as local anaesthesia?

The Effect of Metoclopramide Addition to Lidocaine on Pain of Patients with Grades II and III Post-Episiotomy Repair. Sheida Shabanian, Sara Kalbasi, and Forozan Ganji - The aim of this study is to know about the effect of subcutaneous lignocaine to that of lignocaine and metoclopramide on pain relief after episiotomy. In this study, the patients with episiotomy were used and were said to express their episiotomy pain as a number, from zero (Painless) to 10 (Severe pain) Visual Analogue Scale at 0, 30 minute, 1 hour, 2 hour, 4 hour, 6 hour and 12 hour postpartum. Patients at the second stage of labour (Crowning) were assigned to two groups: In the control group, 5 cc lidocaine 2% and in the case group, 5 cc lidocaine + 10 mg metoclopramide was injected for episiotomy. Then, the pain score was compared between the two groups. Based on the this they concluded that Injection of metoclopramide with lidocaine is more effective than lidocaine alone for relieving the pain after episiotomy. The findings suggested that pain relieved in both control (lidocaine injection) and case (lidocaine injection alongside metoclopramide) groups over time ($p < 0.05$); in other words, both drugs were effective in relieving pain and the effect increased over time. The study indicated that, the pain scores were significantly lower in the group administered with lidocaine alongside metoclopramide than the control group (who were injected with lidocaine) at all the intervals after delivery ($p < 0.05$).

Comparison of the effects of lidocaine prilocaine cream (EMLA) and lidocaine injection on reduction of perineal pain during perineum repair in normal vaginal delivery. Roxana Kargar, M.D., Afsaneh Aghazadeh-Nainie, M.D., and Hamid Reza Khoddami-Vishteh, M.D. compared the efficacy of EMLA cream and lidocaine injection to reduce pain during episiotomy repair [6].

A total of 46 primiparous women with normal pregnancy who referred for normal vaginal delivery and needed episiotomy repair were selected and randomly divided into two groups. For EMLA group, one hour before the estimated time of delivery, 5g of EMLA cream was applied to perinealmediolateral incision, and after the delivery of the fetus and placenta, again 5g of EMLA cream was applied to healthy skin around the episiotomy for repair. In the other group, lidocaine 2% was used before episiotomy and for its repair also. This study concluded that the findings of this study showed that the use of EMLA cream in the site of episiotomy incision in primiparous women can induce a level of analgesia equal to that of lidocaine, and cause a similar level of comfort to the patient. EMLA cream (Eutectic Mixture of Local Analgesics) is one of the local anesthetics [7-8]. This cream is a combination of two analgesics equally combined including lidocaine 2.5% and prilocaine 2.5%. It causes skin numbness via the release of lidocaine prilocaine from the cream to the epidermis and dermis layers, and it makes an effect on pain receptors in the skin and nerve endings. The desired effect was achieved one hour and the maximum effect was achieved two to three hours after the use of the cream and its effect has remained one to two hours after cleaning the skin. A faster absorption of about five to 10 minutes occurred in genital mucosa. After five to 10 minutes of using EMLA cream on women's genital mucosa, the mean duration of anesthesia for laser was 15 to 20 minutes [9-10].

In our study diluted form of lignocaine is used along with

adrenaline, thus even if systemic absorption of lignocaine occurs, there will be no toxicity. The adrenaline induced vasoconstriction will reduce the blood loss during episiotomy, vasoconstriction in turn leads to sustained release of lignocaine leading to increased duration of analgesia and increased comfort to the mother postnatally. Along with clear field for suturing of episiotomy provided by vasoconstriction & reduced blood ooze at the site of episiotomy, the tumescence caused by injecting 0.1% Lignocaine mixed with adrenaline will demarcate the tissues which in turn aids in suturing, thus reducing the episiotomy suturing time. The study showed pain perceived by patients in group A who were given only 2% lignocaine is more than Group B who were given 0.1% Lignocaine mixed with adrenaline (p value less than 0.05), along with the duration of analgesia in Group B is more the Group A with P value less than 0.05. The duration of suturing is more in Group A while compared to Group B (p value less than 0.05). The number of gauzes used while doing & repairing episiotomy is more in Group A than Group B (p value less than 0.05).

Conclusion

The inference of the study shows that tumescent anaesthesia (0.1% lignocaine with adrenaline) has certain benefits when used as local anaesthesia for doing and repairing episiotomy when compared to 2% lignocaine in terms of prolonging duration of analgesia, reducing the time taken to suture episiotomy wound by demarcating the tissues which aids in easy suturing.

Acknowledgement

Not available

Author's Contribution

Not available

Conflict of Interest

Not available

Financial Support

Not available

References

1. Priddis H, Dahlen HG, Schmied V, Sneddon A, Kettle C, Brown C, *et al.*, Risk of recurrence, subsequent mode of birth and morbidity for women who experienced severe perineal trauma in a first birth in New South Wales between 2000-2008: A population based data linkage study. *BMC pregnancy and childbirth*; c2013 Apr 8. [PubMed PMID: 23565655]
2. Goh R, Goh D, Ellepola H. Perineal tears - A review *Australian journal of general practice*; c2018 Jan-Feb. [PubMed PMID: 29429318]
3. Kalis V, Laine K, De Leeuw JW, Ismail KM, Tincello DG. Classification of episiotomy: towards a standardisation of terminology. *BJOG: an international journal of obstetrics and gynaecology*; c2012 Apr. [PubMed PMID: 22304364]
4. Melo I, Katz L, Coutinho I, Amorim MM. Selective episiotomy vs. implementation of a non-episiotomy protocol: a randomized clinical trial. *Reproductive health*; c2014 Aug 14. [PubMed PMID: 25124938]
5. Shmueli A, Gabbay Benziv R, Hirsch L, Ashwal E, Aviram R, Yogev Y, *et al.* Episiotomy - risk factors and outcomes. *The journal of maternal-fetal* [PubMed PMID: 27018243]

6. ACOG Practice Bulletin. Episiotomy. Clinical Management Guidelines for Obstetrician-Gynecologists. Number 71, April 2006. *Obstetrics and gynecology*; c2006 Apr. [PubMed PMID: 16582142]
7. Frohlich J, Kettle C. Perineal care. *BMJ clinical evidence*; c2015 Mar 10. [PubMed PMID: 25752310]
8. Jiang H, Qian X, Carroli G, Garner P. Selective versus routine use of episiotomy for vaginal birth. *The Cochrane database of systematic reviews*; c2017 Feb 8. [PubMed PMID: 28176333]
9. Helewa ME. Episiotomy and severe perineal trauma. *Of science and fiction. CMAJ: Canadian Medical Association journal = journal de l' Association medicale canadienne*; c1997 Mar 15. [PubMed PMID: 9084387]
10. Sultan AH, Thakar R, Ismail KM, Kalis V, Laine K, Räisänen SH, *et al.*, The role of mediolateral episiotomy during operative vaginal delivery. *European journal of obstetrics, gynecology, and reproductive biology*; c2019 Jul 9. [PubMed PMID: 31310920]

How to Cite This Article

Sushmitha, Latha K, Vanathi. A comparative study of tumescent anaesthesia (0.1% lignocaine with adrenaline) versus 2% lignocaine for episiotomy. *International Journal of Clinical Obstetrics and Gynaecology* 2023; 7(2): 141-145.

Creative Commons (CC) License

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.