RESEARCH PAPER | Medical Science | Volume : 4 | Issue : 1 | Jan 2014 | ISSN - 2249-555X

Efficacy of Clonidine as an Adjuvant to Lignocaine Infiltration for Prolonged Analgesia After Episiotomy

KEYWORDS: Episiotomy, Clonidine, Lignocaine

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ABSTRACT *Background: Clonidine, an alpha 2 adrenergic receptor agonist, has been used as an adjuvant with local anaesthetic agents to prolong the duration of peripheral nerve blocks.*

Objectives: The purpose of our study was to compare the efficacy of clonidine 1 mcg/kg with 2% lignocaine and 2% lignocaine alone in prolonging the duration of analgesia after episiotomy with respect to various activities like sitting, walking and squatting.

Methods: A total of 60 female patients, aged 20-40 years, of ASA grade I and II, scheduled for full term vaginal delivery were assigned into two groups of 30 each, lignocaine group (L) and lignocaine- clonidine group (C).Group L received 7 ml of 2% lignocaine while Group C received 7 ml of 2% lignocaine to which 1 mcg/kg of clonidine was added. Haemodynamic parameters and pain scoring using the VAS were monitored. At the end of the research project, the data was compiled systematically and analyzed using appropriate statistical tests by a statistician. Value of p< 0.05 was considered significant and p< 0.001 as highly significant.

Results: Duration of analgesia after episiotomy was significantly prolonged in Group C as compared with Group L with respect to various activities.

Conclusion: Clonidine when added to 2% lignocaine for infiltration before episiotomy clearly improves the quality and prolongs the duration of sensory analgesia obtained.

INTRODUCTION: Episiotomy is the surgical cut made through the perineum during labour to make the vagina larger with the intention of easing the birth of the child.Post delivery, the pain of episiotomy has been described by the mothers as throbbing, pulsating, stinging or burning.

Lignocaine infiltration anaesthesia has been the traditional mainstay worldwide before performing the episiotomy. After the birth of the baby, usually NSAIDs are prescribed to the new mother for pain relief 3-4 times a day

Clonidine, an alpha 2 adrenergic receptor agonist, has been the focus of interest for its analgesic, sedative, sympatholytic and anaesthetic sparing effects and haemodynamic stabilizing properties. It augments the action of local anaesthetics in regional blockades by interrupting the neural transmission of painful stimuli in A delta and C fibres as well as augments the blockade of local anaesthetic agents by increasing the conductance of K+ ions in nerve fibres. It also exerts a vasoconstricting effect on smooth muscles, which results in decreased absorption of the local anaesthetic drug and eventually prolongs the duration of analgesia.

Keeping the pharmacological profile of clonidine in mind, we hypothesized that the addition of clonidine at 1 mcg/kg as an adjuvant to 2% lignocaine for infiltration along the line of episiotomy incision would enhance the quality of analgesia and prolong the duration of pain relief and thereby decrease the requirement of NSAIDs by the mother.

The chief aim of this study was to compare the infiltration of 2% lignocaine with clonidine and infiltration of 2% lignocaine alone for pain relief after episiotomy with respect to the analgesia at the time of incision, while sitting, walking and squatting after delivery, the time when rescue analgesic was required and the total dose of analgesics required after episiotomy.

METHODS: The permission from the institute's ethical committee was sought after submitting the protocol of research methodology to the appropriate authorities. The study was a prospective, double-blind, randomized, controlled trial. 60 female patients, aged 20-40 years, of American Society of Anaesthesiologists (ASA) grade I and II, scheduled for full term vaginal delivery were enrolled in the study. A written informed consent was obtained from all the patients after explaining to them the nature of the study.

The exclusion criteria were patient refusal, ASA grade III and IV, patients on anti-platelet drugs and coagulopathies, severe PIH, seropositive patients, any infection at episiotomy site and lignocaine sensitive patients.

A 20G I.V. access was established for all the patients in the labour room. Patients were randomly allocated into two equal groups of 30 each- lignocaine group (L) and lignocaine-clonidine group (C) and the randomization sequence was generated using a computerized randomization table kept centrally by a research staff nurse.

Group L parturients were infiltrated with 7 ml of 2% lignocaine along the line of episiotomy incision and group C parturients were infiltrated with 7 ml of 2% lignocaine to which 1 mcg/kg of clonidine was added.

During the injection and post delivery, the patient was monitored for pulse, BP and pain scoring using the Visual Analogue Scale (VAS). The time at which the first rescue analgesic was required and the total dose of analgesics required were also noted. Pain scoring was done with respect to different stages and activities viz. 1) at incision 2) while sitting, walking and squatting 3) while defaecation and micturition.

At the end of the study, the data was compiled systematically and analyzed using appropriate statistical tests by a

Volume : 4 | Issue : 1 | Jan 2014 | ISSN - 2249-555X

statistician. Value of p<0.05 was considered significant and p<0.001 as highly significant.

RESULTS: All the demographic characteristics like age, weight and ASA grade were comparable in both the groups and were found to be statistically non-significant (p> 0.05).

Table 1:

Demographic data in the two groups expressed as mean with standard deviation		
	Group L (n= 30)	Group C (n= 30)
Age (years)	24.6 ± 2.41	23.8 ± 2.31
Weight (kg)	52 ± 2.33	54 ± 2.53

There was significant increase in the duration of analgesia , during different activities like sitting, walking and squatting, in Group C as compared with Group L.The analgesia during sitting lasted for (20.50 ± 1.456) hours in Group C as compared with (9.10 ± 0.923) hours in Group L . The analgesia during walking lasted for (20.53 ±1.456) hours in Group C as compared with (8.90 ± 0.845) hours in Group L. Similarly, the analgesia during squatting lasted for (19.03 ± 1.903) hours in Group C as compared with (8.80 ± 0.925) hours in Group L. The difference in the duration of analgesia between the two groups during the various activities was statistically significant (p < 0.001).

Table 2:

Duration of Analgesia during different activities in the two groups expressed as mean with standard deviation		
Activities	Group L (n= 30)	Group C (n= 30)
Pain during sitting	9.10 ± 0.923	20.50 ± 1.456
Pain during walking	8.90 ± 0.845	20.53 ± 1.456
Pain during squatting	8.80 ± 0.925	19.03 ± 1.903

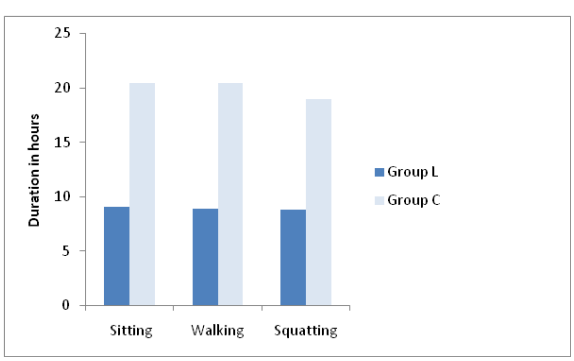

Figure 1: Duration of Analgesia in the two groups

No side effects (nausea, vomiting, dry mouth etc.) were reported during the first 24 hours in the post delivery period in both the groups.

DISCUSSION: Usually the new mothers have to be administered oral NSAIDs viz.Ibuprofen, Diclofenac etc. for pain relief after normal labour and episiotomy 3-4 times a day. In addition to the gastritis caused to the mother, these drugs also pass through breast milk and may have harmful effects on the newborn. They also have to be used very cautiously in parturients with hypertension, diabetes, toxaemia or deranged renal functions.

The pain also deters some mothers from establishing breastfeeding as soon as possible. The importance of colostrum, with all its antibodies granting immunity for life, cannot be over-emphasized.

The mother finds it difficult to sit and walk but sitting on the toilet is worse. This starts off a vicious cycle of constipation requiring laxatives, stool softeners etc. All this overshadows the benefits of normal delivery.

Clonidine was initially used for its antihypertensive properties. The central actions are mediated through alpha 2 adrenoceptors, which are situated at locus coeruleus and dorsal horn of spinal cord. But specific peripheral effects of clonidine appear to be less obvious because alpha 2 adrenoceptors are not present on the axon of the normal peripheral nerve.The four proposed mechanisms for the action of clonidine in peripheral nerve blocks are: centrally mediated analgesia, vasoconstriction due to alpha 2 adrenoceptor effect, attenuation of inflammatory response and direct action on peripheral nerve[1]. The direct action of clonidine on the nerve can be explained on the basis of a study conducted by Dalle et al.They proposed that clonidine, by enhancing activity-dependent hyperpolarisation generated by the Na/K pump during repetitive stimulation, increases the threshold for initiating the action potential causing slowing or blockage of conduction[2].

Popping et al in their metaanalysis of randomized trials showed that the beneficial effect of clonidine on the duration of analgesia was observed with all tested local anaesthetics[1].

CONCLUSION: Clonidine, when used as an adjuvant with 2% lignocaine for infiltration before episiotomy during normal labour, clearly improves the quality and prolongs the duration of sensory analgesia obtained.

It nearly eliminates the requirement of NSAIDs by the exhausted mother and promotes early and effective establishment of breast feeding of colostrum. The unnecessary passage of drugs to the neonate through breast milk is prevented and the mother is much more comfortable while sitting, breast feeding, walking and squatting on toilet.

REFERENCE

1) Popping DM, Elia N, Marret E, Wenk M, Tramer MR. Clonidine as an adjuvant to local anaesthetic for peripheral nerve and plexus blocks : A meta- analysis of randomized trials. Anaesthesiology 2009 ; 111: 406-15. | | 2) Dalle C, Schneider M, Clergue F, Bretton C, Jirounek P. Inhibition of the I (h) current in isolated peripheral nerve: A novel mode of peripheral antinociception? Muscle Nerve 2001; 24:254-61. | | 3) Jayant Nick Pratap, MA MRCPCH, FRCA, Rajesh K. Shankar, FRCA and Teodor Govoszeniuk, FCARCSI.Co-injection of Clonidine prolongs the anaesthetic effect of lignocaine skin infiltration by a peripheral action. Anaesthesia and Analgesia April 2007; Vol 104 no.4: 982-983. | | 4) Eisenach JC, De Kock M, Klimscha W.Alpha 2 adrenergic agonists for regional anaesthesia: a clinical review of clonidine. (1984-1995). Anaesthesiology 1996; 85: 655-74. | | 5) Butterworth JF, Strichartz GR. The alpha 2 adrenergic agonists, clonidine and guanfacine produce tonic and phasic block of conduction in rat sciatic nerve fibres. Anaes. Analgesia. 1993; 76: 295-301. | | 6) Gaumann DM, Brunet PC, Jirounek P. Hyperpolarizing after potentials in C fibres and local anaesthetic effects of clonidine and lidocaine. Pharmacology 1994; 48: 21-29. | | 7) Pettibone DJ, Mueller GP. Alpha adrenergic stimulation by clonidine increases plasma concentration of immunoreactive b endorphins in rat. Endocrinology 1981; 109: 798-802. | | 8) S.Elliot, S.Eckersall, L. Fligelstone and S. Jothilingam. Does the addition of Clonidine affect duration of analgesia of Bupivacaine wound infiltration in inguinal hernia surgery. BJA; Vol 79 (4) : 446-449. | | 9) Kopacz, Dan J, Bernards, Christopher M. Effect of Clonidine on Lidocaine clearance in vivo: A micro dialysis study in humans. Anaesthesiology Dec 2001; Vol 95 (6): 1371-1376. | | 10) Bernard, Jean Marc, Macaire, Phillippe. Dose range effects of Clonidine added to Lignocaine. Anaesthesiology August 1997; Vol 87 (2): 277-284. | | 11) B Brkovic, M Gardasevic, J Roganovic. Lidocaine + Clonidine for maxillary infiltration anaesthesia. International journal of OMF surgery; Feb 2008; Vol 37 (2): 149-155. | | 12) Kroin, Jeffrey S, Buvanendran Asokumar, Beck, Daniel R. Clonidine prolongation of Lidocaine Analgesia after sciatic nerve block in rats. Anaesthesiology Aug 2004 ,Vol 101 (2): 488-494. |