

EFFECT OF WALKING EPIDURAL DOSE ON LABOUR DURATION AND ANALGESIA

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ABSTRACT

Walking or ambulation¹ during normal delivery (labour) is a popular choice for labour analgesia in recent trends, which allows the labouring mother to enjoy the childbirth with active and cheerful participation without any pain.

AIM

To study the effect of Walking Epidural dose^{2,3} on Labour duration and Analgesia.

MATERIALS AND METHODS

In this Prospective Outcome Study, 30 Nulliparous women were given Epidural Analgesia with Ropivacaine and Fentanyl during Labour pain and studied the duration of Labour, Analgesia, and effects on Mother and Foetus.⁴

RESULTS

In the present study with a Walking Epidural analgesia dose of 15 mL of 0.125% Ropivacaine⁵ and Fentanyl 2 µg/mL. The onset of analgesia was 10 minutes and lasted for 3 hours 30 minutes. There is no effect on the duration of 1st stage of Labour. APGAR score at 1 minute was 8 in 94% cases and APGAR at 5 minutes was 10 in 94% of cases.

CONCLUSION

The parturient participated actively in the process of childbirth without delay in the first stage of labour. Neither significant haemodynamic changes nor adverse effects were observed in both newborn and mother.

KEYWORDS

Obstetrical Analgesia, Fentanyl, Ropivacaine, Apgar Score, Labour Stage First.

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INTRODUCTION

Walking⁶ or ambulation during normal delivery (Labour) is a popular choice for labour analgesia in recent trends, which allows the labouring mother to enjoy the childbirth with active and cheerful participation without any pain. During labour by nature, mother experiences severe pain and gives birth to the child. With the use of epidural analgesia from 19th century labour pain became painless. Pain relief in labour has always been with myths and controversies, hence providing effective and safe analgesia during labour is an ongoing challenge. The pioneers of epidural analgesia are Tuffier and Sicard in 1921 and epidural catheter technique was introduced by Tuohy.

AIM

To study the effect of Walking Epidural dose on Labour duration and Analgesia.

MATERIALS, METHODS, AND PROCEDURE

The Study was approved by Institutional Ethical Committee of Siddhartha Medical College, Vijayawada, Andhra Pradesh.

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Written Informed Consent was obtained from all 30 Nulliparous women admitted in the Labour room for Safe Institutional delivery from October 2015 to June 2016. 18 G Epidural kit (System I), L A solution 2% lignocaine in 2 mL syringe, Fentanyl and Ropivacaine ampoules, Multi-parameter monitor, and Emergency kit.

Position

Sitting to avoid acute flexion as pressure of thighs on gravid uterus transiently reduces Uteroplacental blood flow.

Space

Lowest and widest space - L4-5.

Approach

Midline, slightly bevel facing cephalic direction.

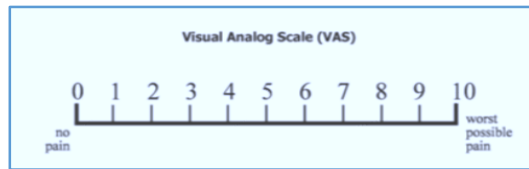
Space confirmed by LORA (Loss of Resistance to Air) fixed the catheter without leaving any space between plaster and the catheter exit along the lordotic curvature at 12th mark. Activation of Epidural Analgesia was done with 0.07% Ropivacaine (15-20 mL) and 30-50 µg Fentanyl given through the catheter at 3 cm dilatation of Cervix in sitting position, waited for 20 minutes.

The drug was administered in Intermittent bolus doses, Assessed the motor block, Slow Leg Raising test, and Knee bend test.

Modified Bromage Score

1. Complete block, unable to move feet and knee.
2. Almost complete block, able to move feet.
3. Partial block just able to move knees.
4. Detectable weakness of Hip flexion.
5. No detectable weakness of Hip flexion.

Patient with MBS score 5 were asked to stand or walk with the help of assistant or spouse under continuous vigilance. Patient is allowed to walk for 10-20 minutes in hour.



Level of Sensory Block was assessed with Visual Analogue Scale

Inclusion Criteria

1. Normal healthy, full term,
2. Singleton pregnancy,
3. Vertex presentation,
4. Active first stage of labour,
5. Age 18-30 yrs.,
6. Weight <75 kg,
7. Height >5 ft. and,
8. ASA-II pregnant women (ASA I grade cannot be ascribed to Pregnant Women as all pregnant women come under ASA II in ASA Physical Status Classification System)

Exclusion Criteria

1. All complicating pregnancies with coexisting diseases.
2. Patient refusal and non-cooperative pregnant.
3. Local infections, frank coagulopathies.
4. Known allergic to LA, opioids, any other drugs.

DISCUSSION

The concept of pain relief during childbirth is a relatively recent one. Practice of labour analgesia was started with the use of Ether by James young Simson⁷ during childbirth (3 months after Morton's historical demonstrations on October 16th 1846). John Snow 1853 administered chloroform⁸ to queen Victoria for her 8th childbirth (Prince Leopold).

Today, pain relief in labour is a standard practice and epidural analgesia is GOLD STANDARD. With the use of epidural technique, full sensory block without motor block, the mother can actively participate in childbirth and she enjoys the birth of baby with the warm feeling of baby's descent and first cry of baby.

Over all acceptance of epidural analgesia for labour is around 60% in major maternity centres in US and one third of pregnant women choose epidural in UK according to 2005-2006 statistics. In India, it is still lacking.

"The delivery of newborn into the arms of conscious and pain free mother is one of the most exciting and rewarding moments in medicine": MOIR.

Labour pain is equal to the pain of digit amputation. More than 90% of labouring mothers request for pain relief during labour. Labour pain affects all systems in the body. Anaesthesiologist should not deny analgesia if there is a request from labouring mother.

Labour Pain affects almost all Systems in the Body

1. Respiratory system: Severe pain → Hyperventilation⁹ → Increased O₂ Consumption → Decreased availability of O₂ to the foetus.
2. Cardiovascular System: Severe Pain → Increased Catecholamines¹⁰ (α, β Adrenergic receptor stimulation)

→ Increased CO and tachycardia. Exaggerates hypertensive response in PIH patients.

3. Increased stress response may cause acid base imbalance.
4. Painful traumatic labour may lead to postpartum stress disorders and psychological disturbances.

Provision of Pain Relief in Labour by Epidural Analgesia¹¹ Result in

1. Blunting of hyper and hypoventilation and haemodynamic response.
2. Decreased maternal catecholamine concentration decreases α and β Stimulation → Improved Uteroplacental perfusion → Improved Uterine activity → Shortens first stage of labour.
3. Beneficial in underlying cardiorespiratory problems and patients with intracranial vascular pathology.

Walking or Ambulation¹² during labour: Upright position → Enhancement of pelvic dimensions → Reduces aortocaval compressions → Increases coordination of uterine contractions (Uterine contractions, frequency) → Facilitates foetal head decent and relaxes pelvic musculature → Less need for Oxytocin augmentation → Shortens first stage of labour → Greatest maternal comfort and satisfaction.

Finally reduces Instrumental and Caesarean delivery¹³ and improves obstetric outcome with improved APGAR score and high maternal satisfaction.

With the combination of novel¹⁴ synthetic opioids with low-dose local anaesthetics, we can achieve no motor, less sympathetic, and more sensory block or maximum motor function preservation with minimum sympathetic effect and no sensory activity is achieved in walking epidural analgesia.

Ideal Labour Analgesic Technique should

1. Reduce pain dramatically.
2. Should not interfere with the progress of labour.
3. Should not increase the incidence of Caesarean sections.
4. Should not cause adverse effects¹⁵ either on mother or on foetus.
5. Should produce highest maternal satisfaction.
6. Should be useful to all labouring mothers.

Gold Standard Technique that affectively fulfils all the above parameters, which effectively relieves both somatic and visceral pain is epidural analgesia (Walking Epidural). This is achieved by a mixture of low-dose Local anaesthetic and opioids. Ropivacaine 0.07 to 0.1% or bupivacaine 0.0625 to 0.125% with fentanyl 2 µg/mL of local anaesthetic solution.

Administered either

- Intermittent bolus.
- Patient controlled analgesia.
- Continuous infusion.

Prerequisite for Performing Epidural Analgesia

1. Informed written consent
 - Discussed about various options of pain relief.
 - Detailed explanation about procedure.
2. Equipment for resuscitation checked
 - AMBU, Airway, ETT, suction catheter, Laryngoscope, Difficult airway kit, circuit and oxygen source, etc.
3. Drugs
 - Vasopressors, emergency drug kit.

4. Wedge to correct Pelvic tilt.
5. Foetal heart monitoring - foetoscope/Doppler/CTG.
6. Airway assessment/Back examination and PAC.
7. Hydration with RL and DNS with a good venous access.
8. Recent platelet count.

Causes of Failed Pain Relief are

1. Patient with full dilatation of cervix.
2. Full bladder.
3. Catheter not in Epidural place.

Complications

1. Blood tap - minimised by
 - Experienced anaesthesiologist.
 - Midline approach (less vascular).
 - Do not thread the catheter beyond 4 cm.
2. Broken/sheared epidural catheter (micro, metallic/glass particles in CSF).
3. Inadvertent Dural puncture, Dural tap, and PDPH.
4. Shivering - prevented by low-dose IV/epidural pethidine or fentanyl.

RESULTS

Sl. No.	Parameter	Observation	No. of Cases	%	
1	Onset of Analgesia	5-10 min	20	66.67	
		10-15 min	10	33.33	
2	Duration of Analgesia	80-99 min	8	26.67	
		100-119 min	16	53.33	
		120-140 min	6	20.00	
3	Quality of Analgesia (VAS)	0	20	66.67	
		1	8	26.67	
		2	2	6.66	
4	Motor Block (MBS)	5	30	100	
		Normal vaginal	26	86.67	
		Caesarean	1	3.33	
5	Mode of Delivery	Forceps	3	10	
		APGAR at 1 min	6	2	6.66
		7	0	0	
6	APGAR at 5 min	8	28	93.33	
		8	1	3.33	
		9	1	3.33	
7	Duration of First Stage of Labour	10	28	93.34	
		140-159 min	4	13.33	
		160-179 min	11	36.67	
		180-190 min	12	40.0	
		191-220 min	3	10.0	

In the present study, the onset of analgesia was 10 minutes and lasted for 3 hours 30 minutes. There is no effect on the duration of 1st stage of Labour. APGAR score at 1 minute was 8 in 94% cases and APGAR at 5 minutes was 10

in 94% of cases. The result of the present study was similar to the studies conducted by Alberts et al¹⁶ and Chestnut et al.¹⁷

Legal Implications

Legal claims are mainly due to - pain during procedure and labour; Emotional and Back pain.

Hence, all issues involving labour analgesia should be appropriately discussed with the patient, if possible video counseling maybe taken for evidence based analgesia. This is best done¹⁸ in the form of Patient education programme during their antenatal visits with the team work of gynaecologists.

CONCLUSION

Walking Epidural Analgesia can be best performed with minimal local anaesthetic volume and minimum local anaesthetic dose of 15 mL of 0.125% Ropivacaine with Fentanyl 2 µg/mL. With this dose of Epidural adequate sensory block was obtained with maximum preservation of motor function. So that parturient participated actively in the process of childbirth without delay in first stage¹⁹ of labour. No significant haemodynamic changes and adverse effects were observed in both newborn and mother.

Gynaecologists, Anaesthesiologists, and nursing people work as a team and make the labouring mother to forget the pain and enjoy the birth of baby with full and active participation.

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