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STUDY TO EVALUATE THE FEASIBILITY AND EFFICACY OF THE "GHULAM TECHNIQUE FOR PAINLESS CHILDBIRTH

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ABSTRACT

OBJECTIVE: *To evaluate the feasibility & efficacy of the "Ghulam technique for painless childbirth" i.e. single shot walking spinal analgesia, an innovation for painless childbirth, with buprenorphine 50 micrograms & bupivacaine 1mg, at cervical dilatation of 3 cms minimum.*
DESIGN: *Prospective, non-randomized, clinical trial.*
SETTING: *This study is conducted at department of anesthesia, critical care & pain management. People's Medical College Hospital Nawabshah, Sind, Pakistan, during October 2008 to April 2009.*
PATIENTS AND METHODS: *100 full term parturients with singleton pregnancy with cephalic presentation of ASA 1 and 11 were included in this study, to test the feasibility and efficacy of the "Ghulam technique for painless childbirth" i.e. single shot walking spinal analgesia, using buprenorphine 300 microgram diluted with sterile water to get 50 microgram in 1ml of hyperbaric bupivacaine 7.5 mg diluted in sterile water to get 1mg in 1 ml total volume 2 ml, with 26 gauge cutting spinal needle Bupiracane through L3, L4 interspace at cervical dilation of minimum 3 cms. Fetal and maternal monitoring was carried out. The motor block was assessed by Bromage scale; sensory block was assessed with Pakistan Coin Pain Scale and Verbal Rating Scale. After confirming the efficacy of block, the parturients were encouraged to sit, stand up and walk; the parturients were monitored for changes in HR, BP, nausea, vomiting, pruritis, urinary retention, respiratory depression, ability to walk immediately after spinal injection without assistance (walking spinal) and duration of analgesia.*
RESULTS: Analgesia: *The results revealed excellent comfort and analgesia within 2 to 3 minutes of spinal injection in 95 (95%) mothers, as they remained pain free for duration of 9 hours.* Motor block: *Bromage scale of 0 was observed in 100% mothers. Almost all parturients, 99% were able to walk immediately after spinal injection, except one who wished to sit.* Hemodynamic variables: *remained stable throughout childbirth except a mild drop in heart rate and blood pressure of less than 10%, no treatment was required.*
CONCLUSION: *With this study we conclude that the "Ghulam technique for painless childbirth" i.e. single shot walking spinal analgesia could be used safely without major side effects and complications for pain less childbirth.*
Further studies are required to confirm the place of this technique in painless childbirth.

KEYWORDS: Pain less delivery, buprenorphine, bupiracane Ghulam technique for pain less child birth.

INTRODUCTION

Painless childbirth before 1846.
Since very begining childbirth has been considered as a painful, life-threatening and fearsome event. In some comparative studies of pain it is proved to be the most intense pain.[1] Early attempts of treating pain of childbirth had been crude and largely ineffective. Morphine was extracted by Adam Serturner in 1806 [2], although it had been used orally to abolish the pain of childbirth but the obstetricians were reluctant to use morphine for childbirth because they believed that it decreases uterine contractions and depresses the child. Physicians also felt no compulsion to relieve the pain of childbirth because they believed that the labor pain is a normal physiological requirement of childbirth. Many physicians and others especially clergy (church man) argued that treating the pain of childbirth is a sin and it is against the will of God [3]. For that they quote Bible Genesis chapter 3, verse 16, "Unto woman He said, I will multiply thy sorrow and thy conception;

in sorrow thou shalt bring forth children." (King James Version) These people were so powerful and cruel that in 1591 Lady Euframe MacAlyane of Edinburgh, Scotland was burned alive at the Stake for asking for pain relief of childbirth[4].

Painless childbirth after 1846, after introduction of inhalational anesthesia.

First successful ether anesthesia was demonstrated by T. G. Morton at the Massachusetts General Hospital on October 16, 1846 at 10:15 am [5]. James Young Simpson an Edinburgh obstetrician administered ether to a difficult obstetric patient for painless childbirth on January 19, 1847 [6], after 3 months of introduction of ether anesthesia, this began a new era of painless childbirth. Painless childbirth gained considerable respect when John Snow administered chloroform to Queen Victoria for the birth of her 8th child, Prince Leopold in 1853 [7] (The Duke of Albany) and later Princess Beatrice in 1857. This led to the use of inhalational anesthetic agents from graduated inhalers with or without nitrous oxide for about a century. These include tecota inhaler (temperature compensated trilene apparatus), Cardiff inhaler (methoxyflurane inhaler), isoxane inhaler (isoflurane inhaler) and entonox inhaler (50% nitrous oxide and 50% oxygen in a cylinder), Entonox is still offered for pain relief in labor.

Introduction of regionals, intravenous and other methods of pain relief in obstetrics. Spinal analgesia was introduced by August Bier in 1898 [8]. Two years later in July 1900, the obstetrician Oscar Kreis, from Switzerland used spinal cocaine analgesia in obstetrics, to relieve pain of childbirth in six parturients [9], complications were a high incidence of intractable PDPH and vomiting. In those early days non-technical personnel practiced spinal anesthesia. Basic knowledge of technique was deficient, spinal needles were crude, there was no concept of fluid preloading, monitoring was not advanced, obviously there was very high incidence of complications that brought discredit to the technique. Mortality and morbidity rate with spinal anesthesia was very high as compared to other methods of anesthesia. It was presumed that spinal anesthesia is the most dangerous of all forms of anesthesia for parturients. The spinal analgesia was abandoned for pain relief in obstetrics until the 1950s. It was during this time that "natural childbirth" [10] and "psychoprophylaxis" [11] were widely advocated to avoid serious anesthesia-related side effects. In the 1940s, childbirth professionals began to challenge the conventional assumptions about the safety of medicalized births. Physicians Michel Odent[12] and Frederick Leboyer and midwives such as Ina May Gaskin pioneered birthing centers, water birth, and safe homebirth as alternatives to the hospital model. Other methods also followed, such as "Dämmerschlaf " "twilight sleep" [13] introduced in Freiburg, Germany by Dr. Carl J. Gauss in the first decade of 20th century. He used morphine and scopolamine, which replaced chloroform for painless child birth and often led to severe maternal & neonatal respiratory depression. Soon it was abandoned due to its side effects.

J A Sicard and F Cathelin[14] in 1901 introduced caudal analgesia with cocaine. Some enthusiastic workers used it for three decades. John Silas Lundy of Mayo clinic was one of those advocates. The greatest exponent of caudal analgesia was Robert Hingson who presented first series of two thousand cases with continuous caudal analgesia for pain less childbirth in September 1946 [15]. Parturients were more willing to accept caudal anesthesia than subarachnoid injections, as the high risk of PDPH was publicly known.

Lumbar epidural analgesia was discovered by Spanish surgeon Fiedal Pages in 1921, (he died just after his publication) and it was rediscovered by Archile Mario Dogliotti an Italian surgeon in 1933 [16]. Lumbar epidurals gained more popularity because the success rate was more frequent, local anesthetic requirements were reduced, and onset of analgesia was faster, the catheter tip was near the T10, T11 and T12, the pain of first stage of labor was successfully abolished by lumbar epidural. The lumber epidural supplanted caudal analgesia and became the technique of choice for painless childbirth in 1950's. Further advancement was added by introduction of epidural catheters, epidural needles specially Tuohy needle and new amide local anesthetic agent lignocaine in 1943 and bupivacaine in 1963. Other refinements in technique were made by introduction of continuous epidurals and patient control epidural analgesia.

Addition of opiates in spinals and epidurals is a recent addition in the management of obstetric pain. In 1970's opiate receptors were discovered [17 & 18]. In 1979, Wang et al[19] first time reported on the efficacy of intrathecal morphine to relieve unbearable malignant pain in 8 patients whereas, Behar and his colleagues [20] in the same year published the first report in Lancet on the epidural use of morphine for the treatment of pain. In the past 30 years, intradural and epidural opiate therapy has been evolved from an experimental model into an important therapy to provide comfort to laboring mothers. Nowadays opiates are mainstay of analgesic therapy with spinal and epidurals. A small intradural dose of an opiate provides immediate pain relief during childbirth without loosing muscle power, with minimal risks to the mother and fetus. This is due to the binding of opiates to specific opiate receptors situated in the substantia gelatinosa of the spinal cord. This led to the wide spread use of combined spinal epidural (CSE) technique. Spinal injections are safe nowadays because the risk of PDPH is reduced with the introduction of pencil point needles introduced by Whitacre in 1951 and the use of smaller size needles 26 and 27 gauge. The literature supports the use of intrathecal narcotics as a safe and effective method of painless childbirth. The ASA Task Force agrees that the rapid onset of analgesia provided by single-injection spinal techniques may be advantageous for selected patients (e.g., advanced labor) [21]. Nowadays, combined spinal epidural analgesia is the approved technique for painless childbirth. In Pakistan most of the childbirth are performed as natural and pain full.

PATIENTS AND METHODS:

This study is conducted at department of Anesthesiology, Critical Care and Pain management, Peoples Medical College Hospital, Nawabshah. During October 2008 to April 2009. 100 full term parturients of ASA 1 and 11 with singleton pregnancy with cephalic presentation were selected to assess the feasibility and efficacy of the "Ghulam technique for painless childbirth" i.e. single shot walking spinal analgesia for painless childbirth. Using 0.3 mg buprenorphine diluted in sterile water to get 50 microgram in 1 ml of 0.75% hyperbaric bupivacaine diluted in sterile distilled water to get 1mg in1 ml of total volume 2 ml, with 26 gauge cutting spinal needle Bupivacaine, at cervical dilation of minimum 3 cms.

After taking the history, clinical examination and using inclusion and exclusion criteria, the mothers were selected for painless childbirth. Urinary catheters were not passed to any mother. All the mothers were asked to pass urine before and after every two three hours of spinal analgesia even if they don't desire to pass urine. There were no restriction to drinking, eating and walking before and after spinal injection. No oral or intravenous medications were prescribed except co-amoniclare drugs of labors. We tried to give a near physiological environment to mothers with minimal intervention of only passing one 18 gauge intravenous cannula and a single shot of

spinal injection. No intravenous fluids were infused for preloading or maintenance. Continuous blood pressure monitor, ECG monitor and oximeter were applied, Spinal analgesia was established with standard technique in operation theatre suite, with all aseptic measures washing, scrubbing, gowns and gloves, through L3, L4 interspace in lateral decubitus position with spinal needle bevel directed cephalic, barbotage was done with equal amount of CSF and the drug injected slowly. Patients were kept supine after spinal injection. Fetal and maternal monitoring was carried out and recorded.

The sensory block was assessed with (Salim's) Pakistan Coin Pain Scale [22] with per abdominal examination to observe pain free uterine contraction.

Char anna = 25%
Ath anna = 50%
Bara anna = 75%
Sola anna = 100%

The motor block was assessed by Bromage scale

0 = full flexion of knees and feet.
1 = just able to flex knees, full flexion of feet.
2 = unable to flex knees, but some flexion of feet possible.
3 = unable to move legs or feet.

After confirming the efficacy of block, the patients were encouraged to sit and than stand up with support from operation theatre table and encouraged to walk immediately without loosing time. Obstetrician and anesthetist accompanied first round of walk with facilities to escort the parturient in case of difficulty in walking or any problem. Other walks were accompanied with attendants till delivery of baby. The parturients were observed for percentage and duration of analgesia and ability to walk after spinal injection without assistance. The parturients were also monitored for side effects and complications like nausea, vomiting, pruritis, urinary retention, hypotension (decrease in BP less than 10% was acceptable without treatment but more than 10% was supposed to be managed with i/v fluid or vasopressor if required. In our study no parturient required i/v fluids or vasopressors) and bradycardia (as there is great heart rate variability (HRV) in parturients with uterine contraction the lower point where anticholinergics were supposed to be used was HR less than 60 per minute. In our study, none of the parturients required anticholinergics) and the results were recorded.

Inclusion criteria were.

- ü Full term singleton pregnancy with cephalic presentation.
- ü Written informed consent and cooperation of mother.
- ü Physical status ASA 1 and 11.
- ü Normal stature.
- ü Uncomplicated pregnancy.
- ü In active labor with cervical dilatation of minimum 3 cms.

Exclusion criteria.

- ü Refusal of patient.
- ü ASA 111 and 1V.
- ü Obesity.
- ü Coagulopathies.
- ü Abnormal anatomy of spine.
- ü Infection at the site of lumbar puncture.
- ü Expected to be difficult case. (Candidates for c-section)
- ü Previous c-section.
- ü Bad obstetrical history.

RESULTS:

100 full term parturients, with singleton pregnancy, with cephalic presentation, of ASA1 and 11, for painless childbirth were selected (non randomized selection) on request to test the feasibility and efficacy of the "Ghulam technique for pain less child birth" i.e. single shot walking spinal analgesia for painless childbirth.

Analgesia: The results revealed excellent comfort and analgesia sola anna (ie 100% pain relief) within 2 to 3 minutes of spinal injection in 95% mothers. In two (2%) parturients, there was no effect of block. In another three (3%) parturients there were complaints of moderate pain, Ath anna relief (i.e. 50% pain relief) during contractions.

Motor block: Bromage scale of 0 was observed in 100% mothers. 99 parturients (99%) were able to walk immediately after spinal injection, except one who requested to sit after one minute of walk.

Hemodynamic variables: Remained stable throughout childbirth except a mild drop in heart rate and blood pressure of less than 10%, no treatment was required. There was due heart rate variability with uterine contractions.

Side effects: ***Nausea vomiting:*** in our study the incidence of nausea vomiting was very low, only 6 women (6%) complained of mild to moderate nausea in first 30 minutes, blood pressure and heart rate were checked both were found in normal limits in all six mothers, out of these six, three mothers vomited once in first hour, no treatment was prescribed, moral support was given, we deliberately omitted the antiemetic treatment because the complaints were of mild type, second we tried to limit the use of antiemetic, (almost all antiemetic are hypotensive or sedatives)

Pruritis: three mothers (3%) complaining of mild pruritis, no treatment was prescribed.

Urinary retention: no mother complaint of urinary retention but they lost their desire to pass urine, there was no problem in passing urine.

Complications: 1. In one primigravida the duration of childbirth exceeded 10 hours & she delivered successfully with some mild pains in last hour of delivery.

2. In five cases caesarean sections were performed due to obstetrical causes two were fetal distresses due to cord around neck, two cases were of unknown fetal bradycardia and fifth case was operated due to cord prolapse on rupture of membrane half hour after spinal injection (these all parturients remained pain free)

Coincidental Observation: Cervical dilation was faster as compared to standard (Obstetricians comments).

Apgar scores were comparable to standard, no stillbirth or early neonatal death observed.

DISCUSSION:

The first and foremost goal of any technique of pain less childbirth is the safety of mother and child. In general the technique of painless childbirth should not affect any physiological variable of mother except blocking the pain sensations. Since 161 years of hard work of researchers and clinician, we have reached the ideal or near ideal techniques of painless childbirth, but the question is how much women of the world are getting benefit of these techniques ? Are these facilities available to all the willing mothers of developed countries like UK, USA, Canada and Europe? Can we apply these techniques in developing countries? The problem is feasibility and that is the objective of my discussion. The feasibility of spinal analgesia is far far superior to other available techniques of painless childbirth.

Traditionally, labor epidural has been used for providing comfort during childbirth. The low concentration of drugs often produces delay in onset of analgesia and high concentration of solution produced side effects like motor loss and hypotension. To overcome this problem, the CSE technique was developed. In this technique spinal injection of drugs is given to produce immediate analgesia without motor loss or significant hemodynamic change. The epidural catheter allows drugs to maintain labor analgesia and provides a means to manage anesthesia for operative childbirth if required. The drugs most often used for intrathecal administration include sufentanil, fentanyl and morphine. Unfortunately these drugs are not available in our setup.

Our department of anesthesiology critical care and pain management offers the services of painless childbirth to obstetric patients at our institution since November 1998. Commonly used technique was combined spinal epidural analgesia with separate spinal needle from separate lumbar space. As intradural recommended drugs like fentanyl sufentanil and morphine are not available here. In our CSE technique, initially we used buprenorphine 30 microgram and later on 50 microgram with bupivacaine hyperbaric 2.5 mg intrathecally and 0.1% 10 ml (10mg) bupivacaine epidurally simultaneously with good success. Later on we planned to activate epidural until mothers requested for it. In that case almost all childbirths were performed under spinal part of CSE ie without activating epidurals. Than we started single shot spinal analgesia with buprenorphine 50 microgram and bupivacaine 2.5 mg with same good results. The problem with this technique was that, the mothers were not able to walk immediately after spinal injection and there was some degree of hypotension and fluid loading required. Although mothers were able to sit, move their legs and change their positions in bed without support but unable to walk immediately after spinal injection. Than we used MLAD (minimum local analgesic dose) of hyperbaric bupivacaine 1.9 mg [23]. The problem still persisted than we reduced the dose of bupivacaine to1.5 mg and finally 1mg to avoid hypotension and motor block and to manage quick mobility of mothers. At last we succeeded in getting the goal of walking spinal for painless childbirth. By this we have successfully devised a technique, which fulfils almost all the criteria of a safe and feasible technique for painless childbirth without any major side effects. Except it cannot be used for operative childbirth. We also tried few cases with buprenorphine 50 micrograms without bupivacaine but failed to produce effective analgesia. In this study we are trying to assess the efficacy and feasibility of walking spinal analgesia for painless childbirth using 50-microgram buprenorphine and one milligram bupivacaine.

There are several international and local studies, which recommend the safe use of intradural buprenorphine in different doses for different procedures and certify the efficacy, quality, minimum side effect and long duration of action Lanz E, 12 hours [24], Celleno D, 420 sd 24 min (7 hours) [25], Khan FA, 834+/- 59 min (14hours)[26], Shah FR, 9.24+/-2.57 hours[27], Lipp M, 13 hours [28], Sen M [29]. A comparative study of Bucklin BA[31] shows quality of intradural narcotics equal to epidurals local anaesthetics. In a Swedish study of Lundborg C N [30] low dose buprenorphine and bupivacaine has been use for 861 day by intrathecal pump with 90 to 100% pain relief in a terminally ill cancer patient.

We don't find any study in literature in which buprenorphine 50-microgram and bupivacaine one-milligram intrathecally has been used to produce effective analgesia for painless childbirth.

CONCLUSION:

From this study we concluded that the "Ghulam technique for painless childbirth" ie single shot walking spinal analgesia could be used safely without any major side effects or complications for painless childbirth. Further studies are required to confirm the place of this technique in painless childbirth.

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