POST OPERATIVE PAIN RELIEF IN CAESAREAN SECTION

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ABSTRACT

Eighty female patients in the age group of 20-40 years, weighing 40 ± 15 Kg, in ASA physical status I and II, awaiting either elective or emergency caesarean delivery were selected for this study. Patients with cardiovascular disorders and those with significant systemic ailments were excluded from the study. They were randomly divided into two equal groups of 40 patients each. Group I was subdivided randomly into two equal sub-groups (1A and 1B) of 20 patients each and was selected for administration of epidural narcotics. Patients in sub-group 1A were given epidural morphine in the dose of 3-5 mg and those in subgroup 1B were given buprenorphine in the dose of 0.1-0.15 mg. Group II consisting of 40 patients, were again subdivided randomly into two equal subgroups (2A and 2B) of 20 patients each and were selected for administration of parenteral (intravenous) narcotics. Patients in subgroup 2A were given morphine in the dose of 5-7.5 mg I.V., and those in subgroup 2B were given 0.15-0.3 mg of buprenorphine intravenously. The degree of pain relief was assessed by applying numerical rating scale (NRS) and resulting complications were observed and recorded. It was found that 60-80% of patients with epidural narcotics, with various dosage schedules, experienced good to excellent analgesia as compared to 30-40% of patients with parenteral use of narcotics.

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KEY WORDS : Analgesia; Caesarean section; Epidural narcotics.

Introduction

During the last two decades or so, there has been a dramatic increase in the rate of caesarean delivery in developed and developing countries of the world. From 6% in late 1970's, the rate has increased to vary between 15-20% or even more in the current obstetric practice [1]. The reason for this rapid rise in the caesarean delivery rate can be attributed to many factors. The operation is becoming increasingly safer, on one hand, while a labour conducted is becoming increasingly litigation prone on the other. The desire on the part of patients to undergo a pain and anxiety free delivery is an important aspect in the increasing trend. The obstetrician's desire to prevent risk of ischaemic injury to the foetus due to varied reasons of prolonged labour and his utmost concern about the safety of mothers health, which can be at risk due to stress of labour and delivery, also has a role in this increasing trend. Other factors like patients anxiety, avoidance of serious trauma to mother and the newborn by difficult vaginal delivery, obstetric malpractice, and the fear of allegation of negligence are some of the prevalent reasons for this present trend [2].

Obstetric anaesthesia practice has been modified to make caesarean delivery as comfortable and natural for the parturient as possible and to fulfill the mothers wish to have psychological bond with new born with-

out the distraction of postoperative pain or side effects of medication. Conventional modalities to keep mother free of pain by parenteral narcotics are usually met with disappointing results due to variable psychological responses and associated side effects. Use of epidural narcotics for the post caesarean section pain relief is relatively a new area in anaesthesia practice. This study was designed to use narcotics (morphine or buprenorphine) epidurally for postoperative pain relief and compare results with parenteral use of narcotics.

Material and Methods

80 adult patients in the age group of 20-40 years weighing 40 ± 15 Kgs proposed for elective or emergency caesarean section delivery were the subjects for the study. Parturient with significant cardiac or other systemic illnesses were excluded from the study. Patients were randomly divided into two equal groups of 40. Informed written consent was obtained accordingly. All patients were pre-medicated with atropine sulfate 0.6 mg intramuscularly, 45 minutes prior to surgery or intravenously on the table in case of emergency surgery.

Group-I, consisting of 40 patients was subdivided randomly into two equal sub-groups (1A and 1B) of 20, who were selected for administration of epidural narcotics. Patients in sub-group 1A were given epidural morphine and those in subgroup 1B were given buprenorphine. Group II consisting of 40 patients, was again subdivided randomly into two equal subgroups (2A and 2B) of 20 who were selected for administration of parenteral (intravenous) narcotics.

Patients in subgroup 2A were given morphine and those in subgroup 2B were given buprenorphine intravenously. Epidural anaesthesia was administered with the help of Tuohy needle at

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TABLE 1
Assessment of degree of pain

Numerical rating scale	Degree of pain relief
8 - 10	Excellent
5 - 7	Good
4 - 5	Satisfactory
< 4	Unsatisfactory

TABLE 2
Distribution of patients receiving epidural narcotics (Group 1)

Dose	Subgroup 1A		Subgroup 1B	
	Morphine 3 mg	Morphine 5 mg	Buprenorphine 0.1 mg	Buprenorphine 0.15 mg
Single dose	6	8	5	6
Double dose	4	2	5	4
Total	10	10	10	10

TABLE 3
Distribution of patients receiving parenteral narcotics (Group 2)

Dose	Subgroup 2A		Subgroup 2B	
	Morphine 5 mg	Morphine 7.5 mg	Buprenorphine 0.15 mg	Buprenorphine 0.3 mg
Single dose	4	3	3	3
Double dose	6	7	7	7
Total	10	10	10	10

TABLE 4
Response to epidural narcotics (Group 1) (Number of patients)

Degree of pain relief (NRS.)	Subgroup 1A		Subgroup 1B	
	Morphine 3 mg	Morphine 5 mg	Buprenorphine 0.1 mg	Buprenorphine 0.15 mg
Excellent	4	5	3	4
Good	2	3	3	2
Satisfactory	3	2	2	3
Unsatisfactory	1	0	2	1
Total	10	10	10	10

TABLE 5
Response to parenteral narcotics (Group 2) (Number of patients)

Degree of pain relief (NRS.)	Subgroup 2A		Subgroup 2B	
	Morphine 3 mg	Morphine 7.5 mg	Buprenorphine 0.15 mg	Buprenorphine 0.3 mg
Excellent	1	2	1	2
Good	2	2	2	2
Satisfactory	2	2	2	2
Unsatisfactory	5	4	5	4
Total	10	10	10	10

L2-L3 spinal level and a standard dose of 12-15 ml of 15% xylocaine was injected. Epidural catheter of appropriate size was inserted through Tuohy needle and left in situ for subsequent use. Subgroup 1A patients received morphine at a dose of 3 mg or 5 mg and subgroup 1B patients received buprenorphine at a dose of 0.1 mg or 0.15 mg epidurally. Dosages of morphine or buprenorphine were diluted to 20 ml with saline and injected through the epidural catheter after termination of the surgical procedure. Patients were allowed to be supine for 15 minutes before being shifted from operation table to recovery room (Table-2)

Subgroup 2A patients were administered morphine at a dose of 7.5 mg or 5 mg IV and subgroup 2B patients were given buprenorphine at a dose of 0.3 mg or 0.15 mg IV, after termination of the surgical procedure. The standard dose of either morphine 5 mg or buprenorphine 0.15 mg was repeated through intravenous route on complain of slightest pain by the patient (Table-3). All patients were observed for quality of pain relief following first injection (Numerical Rating Scale), duration of analgesia vis-a-vis number of patients requiring repeat dose within 12 hours and complications (Table-1).

Vital parameters and pulse oximeter were continuously monitored in all the patients to identify the onset of respiratory and haemodynamic alterations at the earliest so as to take corrective measures and avoid discomfort and risk to the patients.

Chi-square test was applied to compare the results of epidural and parenteral narcotics.

Results

In group I (epidural series) patients who received morphine, 60% of patients (with dose of 3 mg) to 80% (with dosage of 5 mg) had good to excellent degree of analgesia (Table 2 and 4) and repeat dose was required only after 12 hours of first dose where as in remaining 40% of patients with morphine dosage of 3 mg or 20% of patients with morphine dosage of 5 mg required repeat dose within 12 hours (Fig 1 and 3). Similarly with buprenorphine dosages of 0.1 mg or 0.15 mg (Table 2 and 4), 50% of patients in each group had good to excellent analgesia with requirement of repeat dosages in remaining patients within 18-20 hours following the first dose (Fig 2 and 4). The difference between morphine and buprenorphine in terms of degree of analgesia was not found to be statistically significant. Respiratory depression was seen with both morphine 5 mg and buprenorphine 0.15 mg in one patient each with fall of SaO₂ to 90% with morphine and 91% with buprenorphine requiring no active treatment except encouraging the patients to take deep breath. With parenteral use in dosage of 5 mg IV or 7.5 mg IV 30-40 patients had good to excellent analgesia with single dose while repeat dose was required in remaining patients within 6 hours (Fig. 2 and 5) whereas with buprenorphine 0.15 mg or 0.3 mg, only 30% of patients had good to excellent analgesia (Table 3 and 5) with single dose while remaining 70% patients required repeat dose within 18-20 hours (Fig 2 and 6). The difference between epidural narcotics and parenteral narcotics in terms of degree of analgesia and number of patients who required repeat dose of morphine (Table 3 and 5) within 12 hours was statistically significant ($p < 0.05$).

Although, number of patients who developed complications was comparatively higher with epidural narcotics (30%) than with parenteral narcotics (7.4%), clinical severity was not significant as most of the complications were minor and of little clinical significance; and none of the patients required active treatment either for respiratory depression, pruritus or other complications.

Discussion

The mechanism of postoperative pain, more so, following caesarean delivery is neither well understood nor given due importance. It is usually relegated to a stereo typed and inadequate time bound analgesic dosage by nursing staff. A number of important factors have been identified which may affect the occurrence, intensity and duration of postoperative pain. These include preoperative psychological, physical, and pharmacological make up, and preparation of the patients, the site, nature, and duration of operation itself, type of incision, major intraoperative untoward events, presence of serious complications in postoperative period, anaesthetic management and quality of postoperative care [3].

Parenteral methods for postoperative pain relief include parenteral administration of various narcotics and NSAIDs. Parenteral narcotics administered at regular timely intervals or on patients demand are well recognized. Wide patient variation, in requirement and response, leads to either over dosage or under prescription. Intravenous injections are effective in rapidly achieving adequate analgesic blood level of drugs, but have the disadvantages of rapidly appearing side effects like undue sedation and respiratory depression and have short duration of action due to a faster redistribution and elimination of drugs. The blood level of narcotics after intramuscular injection is not consistent throughout till the next injection is due. With parenteral use of either morphine or buprenorphine, only 30-40% of patients were drowsy and non-cooperative during postoperative care.

Administration of narcotics through epidural technique has brought in a new era of management of pain following caesarean delivery [4]. This technique is simple and safe in experienced hands and provides long lasting and better quality analgesia as compared to parenteral use of narcotics. Opioid receptors are distributed in the spinal cord laminae (Substantia gelatinosa, Rexed laminae I,II,V), spinal cord nuclei as well as other neural and non-neural tissue. At least five different opioid receptors have been recognised which may serve several functions in addition to modulating pain perception. There are many factors that affect the narcotic activity of epidural administration such as lipid solubility, pre-existing plasma levels, receptor binding affinity, volume and molecular weight of the drug [5].

In our study, patients who received 3 mg morphine epidural, 60% of them had good to excellent degree of analgesia whereas with increase in dose of morphine

to 5 mg epidural, the quality of analgesia improved to 80% but these patients were less alert and a decrease in the respiratory rate was observed which could be managed by just encouraging the patients to breathe deeply at a faster rate and thus preventing a drastic fall in SPO₂ to critical level (90% or below). The duration of analgesia was related to degree of analgesia achieved. Patients with good to excellent analgesia required repeat dose after 12 hours. Duration of analgesia was longer with buprenorphine between 18 - 20 hours in 50% of patients with good to excellent analgesia and even in remaining 50% analgesic effect lasted for 12-16 hours. Epidural morphine had more predictable analgesia than buprenorphine, which showed wide patient variation, and less predicatability [6]. It is convincingly evident in our study, that epidural narcotics produce better quality and longer duration pain relief compared to parenteral administration of morphine.

Plasma levels of narcotics following epidural injection were found by other workers to be generally similar to those following parenteral IV injection [7]. Analgesia onset is usually delayed following epidural injections. For this reason, it is important to administer the drug well before complete regression of the effect of earlier dose. This is the reason repeat dosage should be given before the break-up pain starts, as it was practised in our study.

The complications associated with epidural narcotics were minimal, the most feared side effect of respiratory depression was seen only in one case each with higher dosage schedule of morphine (5 mg) and buprenorphine (0.15 mg). Though the number of patients who suffered complications with epidural narcotics was higher (12 out of 40) as compared to parenteral (3 out of 40) the severity of complications was not of much clinical significance.

The findings of our study can be concluded with observation that administration of epidural narcotics for postoperative pain relief is a better mode of providing pain relief following caesarean deliveries. The difference was statistically significant (p value < 0.05). And it is recommended to use epidural narcotics in the lower dosages 3 mg morphine or 0.1 mg buprenorphine to achieve desirable results in terms of quality, duration of analgesia and overall patient satisfaction.

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