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A Comparative Analysis of Epidural Block With Ropivacaine And Bupivacaine For Elective Gynaecological Surgeries

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Abstract

Aims: The aims and objective of this study were to compare the onset of sensory & motor block & time for maximum spread of anaesthesia ; to compare the duration of analgesia & duration of motor blockade; to compare associated haemodynamic changes and to evaluate the incidence of side effects.

Materials and Methods: Our study included 80 female patients, aged between 20 to 60 years, height 150-180 cms, weight 45-70 Kgs of ASA Grade I and II, scheduled for elective lower abdominal surgeries. Patients were divided into two groups**;** Group A (n=40): 15 ml of 0.75% Ropivacaine (112.5 mg) and Group B (n=40):15 ml of 0.5% Bupivacaine (75 mg)

The onset and duration of analgesia, time to maximum spread, Onset and duration of motor block, changes in blood pressure, pulse rate, respiratory and side effects, if any were noted for both studies group

Results- the onset of analgesia in Group A was 13.65 (± 1.27) min while in group B cases it was 13.93 (±1.45), .in Group A, observed time for maximum spread was 17.35 ± (1.80) min, while in group B cases it was 17.78 ± (1.18) min. the duration of analgesiaGroup A was 186.0± (16.962) min while in group B cases it was 188.80 ± (3.393). onset of motor block in Group A was 17.5± (1.530) min while in group B cases it was 17.95 ± (1.37)min . the duration of motor block inGroup A was 189.70 (± 6.892) min and in group B 187.60 ± (6.164) min. Total VAS score of group A subjects at 4.27 (± 0.45) hour while in group B cases it was 4.15 (± 0.42)

Key words: epidural, ropivacaine, bupivacaine

Introduction

Severe postoperative pain may have consequences increasing the stress response to surgery seen as a cascade of endocrine, metabolic and inflammatory events that ultimately may contribute to organ dysfunction, morbidity, increased hospital stay and mortality. The pain often causes the patient to remain immobile, thus becoming vulnerable to deep venous thrombosis, pulmonary atelectasis, muscle wasting and urinary retention. Besides restlessness caused by severe pain may contribute to postoperative hypoxemia.[1]

Assessing postoperative pain is very important. The aim of assessment is to determine the intensity, quality and duration of pain, to help decide on the choice of therapy

and to evaluate the relative effectiveness of different therapies.

Approaches to the measurement and assessment of pain include verbal and numerical rating scales, visual analogue scale (VAS), behavioral observation scales and psychological responses. Of these the VAS is the most frequently used self rating score.

The first approach to the epidural space was the caudal approach reported by **"Sicard and cathelin in 1901**. Twenty years later in 1921, **Fiedel pages**" reported his work with lumber epidural anaesthesia. Pages was the father of modern EPIDURAL anaesthesia.

Continuous infusion of epidural local anesthetics results in effective pain relief and is recommended after major thoracic, abdominal and orthopedic surgery and may be a prerequisite for enhanced recovery in such procedures.

Single shot epidural injections may be useful in providing the best analgesia on the day of surgery. These are most effective when a catheter is left in place for intermittent or continuous infusions. Interrupting the pain pathway using epidural route avoids the disadvantages, associated with systemic opioids and provides more complete pain relief in postoperative period.

Epidural blockade of approximate segment with analgesic have following advantage:

1. It relieves both somatic as well as visceral pain, thus provides more complete relief in post operative analgesia.
2. Epidural analgesia also reduces the metabolic response to surgical trauma and thus prevent post operative negative nitrogen balance.
3. Central nervous system depression is avoided hence patient remains alert, co operative and free from respiratory depression.
4. Epidural analgesia have a beneficial effect on postoperative oxygenation and pulmonary function.[2,3]
5. Complete analgesia without sedation provides better patient mobility in immediate post operative period, which results in reduced incidence of chest infection and deep vein thrombosis and reduce the rehabilitation tme.[4,5]
6. Reduces cardiac ischaemia and dysrhythmia in high risk patients.[6]
7. Reduces Postoperative ileus and thereby reducing hospital stay.[7]

In this study an attempt was made to compare bolus Bupivacaine 0.5% & Ropivacaine 0.75% in lumber epidural analgesia for lower abdominal surgeries.

The aims and objective of this study were:

- To compare the onset of sensory & motor block & time for maximum spread of anaesthesia ;
- To compare the duration of analgesia & duration of motor blockade;
- To compare associated haemodynamic changes
- To evaluate the incidence of side effects.

Materials And Methods

Study Area

The present study was conducted in the Department of Anaesthesiology, N.S.C.B. Medical College, Jabalpur (M.P.)

Selection of Cases

After obtaining institutional ethics committee approval & written informed consent, 80 female patients between 20-60 years of age, height 150-180 cms, weight 45-70 kgs & ASA Class I & II, undergoing elective gynaecological surgeries under Epidural anaesthesia were included in this study.

Exclusion Criteria

1. Coagulopathy

2. Neurological diseases
3. Spine deformities
4. Diabetes mellitus
5. Hypertension
6. Allergic to Amide local anaesthetic
7. Pregnant or lactating women

Sample Size and Group Division

For the study purpose, all the patients were randomly allocated into 2 groups of 40 each & received drugs as follows:

Group A (n=40): 15 ml of 0.75% Ropivacaine (112.5 mg)

Group B (n=40): 15 ml of 0.5% Bupivacaine (75 mg)

A complete preanaesthetic evaluation was carried out. Baseline pulse rate, Blood pressure, Respiratory rate was recorded patients were explained regarding the possible risks & complications. The concept of visual analog scale (VAS) was introduced to all the patients before surgery. Only patients who understood the scale and were capable of expressing their pain in terms of the scale were included in the study.

After securing an I.V. access with appropriate cannula, all the patients were preloaded with 10ml/kg of Ringer lactate within 15 minutes before the Block. No pre-medication was given. Non-invasive monitors like ECG, NIBP, & pulse oximeter were attached.

Drugs

1. Ropivacaine hydrochloride monohydrate in 0.75%. (available as Ropin 0.75% preservative free preparation)
2. Bupivacaine Hydrochloride in 0.5% concentration (available as Sensoricain 0.5%.)

Epidural Tray

This consists of following items sterilized by autoclaving:

- Sponge holding forceps
- Cotton swabs
- Gauge pieces
- Tuohy needle 16 G & epidural catheter (Disposable)
- Glass syringe of 5 ml & disposable syringe of 2 ml & 20 ml
- Disposable hypodermic needle 24 G & 18G
- Sterile towels

Technique

After taking all aseptic precautions, a local wheal was raised with plain Xylocaine using 24 G needle, Epidural needle was inserted through midline or paramedian approach at L_2-L_3 or L_3- L_4 interspace. Epidural space was identified by "Loss of resistance" technique & a disposable catheter inserted into epidural space & secured with adhesive. After catheter placement a test dose of 3ml 2% Lignocaine with adrenaline 1: 200000 was injected to all the patients. The patients were monitored for subjective & objective signs of any inadvertent intravascular or intrathecal injection. Patients were asked to report any unusual subjective sensation during epidural injection and also monitored for objective signs on ECG, NIBP, SpO_2 and respiratory rate. Five minutes after the test dose, in absence of any adverse sequelae, 15ml of study solution was injected as allocated in both studied group.

The time of administration of the drug into epidural space was noted.

Onset of Analgesia

The onset of sensory analgesia was defined as loss of sensation to bilateral pin prick, which was tested every 2 minutes in the initial 30 minutes and then every five minutes, until surgery starts.

Time to Maximum Spread

Time to maximum cephalad spread was defined as time from onset of analgesia up to highest level of sensory analgesia achieved.

Onset of Motor Block

(Using modified Bromage scale)

0=able to straight leg raise, full flexion of knee & feet

1=Inability to raise leg, able to flex knees

2=Inability to flex knees, able to flex ankles

3=Inability to flex ankles

Assessment will make at 2,5,10,15,20,25 & 30 min & every 30 min thereafter until the block will have regressed completely.

Duration of Analgesia

It was defined as duration from maximum cephalad spread to postoperative VAS score >3.

Analgesia and muscle relaxation during surgery was judged as satisfactory or unsatisfactory. If the patients experienced any discomfort or moved their limbs, so as to interfere with surgery, the block was deemed unsatisfactory.

Monitoring

Throughout the procedure B.P. was monitored every 5 min, pulse & SPO_2 was monitored continuously. Onset of Bradycardia was defined as fall in heart rate less than 60 per min & hypotension fall in B.P. more than 20% below Baseline, both were treated with Inj. Atropine 0.6 mg I.V. Bolus, 0.3 mg increments if necessary & incremental doses of I.V. Ephedrine 6 mg respectively.

Surgery was permitted only when the block was adequate in density and spread. An upper sensory level of T6 and lower level of S5 were considered to be appropriate. General anesthesia was instituted whenever the block was inadequate.

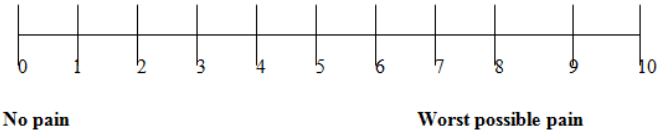
Fluid management was done according to requirements including fluid deficit, maintenance, blood loss etc. Throughout the procedure, patients were asked for any nausea, vomiting, shivering, pain and any discomfort.

Postoperatively vital signs were recorded every 15 min. and VAS score for every 30 minutes in I^{st} hour and then hourly until 1^{st} dose of rescue analgesic (Inj. Diclofenac sodium 75 mg) was administrated.

Visual analogue scale

First described by **Bond MR and Pilousky I in 1966.**[63] Pain intensity was evaluated using a 10 cm visual scale, one end ('0' point of VAS) of which shows no pain ad other end ('10' point of VAS) worst possible pain. The patients were asked to grade the severity of their pain using this scale. This does have its limitations, but for all practical purposes, it is easiest and simplest type.

Visual analog scale



Observation and result: Eighty female patients of ASA I & II, between 20-60 yrs of age, scheduled to undergo elective gynaecological surgeries were included in this study. They were randomly allocated into 2 groups of 40 each and received drugs as follows.

Group A: 15ml of 0.75% Ropivacaine (112.5mg).

Group B : 15ml of 0.5% Bupivacaine (75mg).

The onset and duration of analgesia, time to maximum spread, Onset and duration of motor block, changes in blood pressure, pulse rate, respiratory and side effects, if any were noted for both studies group.

Table 1: Age Wise Distribution Of Patients

Age in Years	No. of Patients		Percentage
	Group A	Group B	
20-29	1 (2.5%)	1 (2.5%)	2 (2.5%)

30-39	10 (25%)	17 (42.5%)	27 (33.8%)
40-49	18 (45%)	15 (37.5%)	33 (41.3%)
50-60	11 (27.5%)	6 (15%)	17(21.3%)
Mean ± SD	44.33± 7.917	42.43± 8.155	100%

t = 1.057,P>0.05

This table shows the age wise distribution of both studied group. Patients of age group 20-60 were included in our study, maximum number of patients (41.3%) belonged to 40-50 years age group and minimum number of patients (2.5%) in 20-29 years age group. The mean age of Group A subjects were observed 44.33 (± 7.917) and Group B cases it was 42.43 (± 8.155) and there were no any significant difference (P>0.05).

Table 2: Weight Wise Distribution Of Patients

Weight in Kg	No. of Patients		Percentage
	Group A	Group B	
45-49	5 (12.5%)	3 (7.5%)	8 (10%)
50-54	9 (22.5%)	9 (22.5%)	18 (22.5%)
55-59	22 (55.0%)	22 (55.5%)	44 (55%)
60-64	4 (10%)	4 (10%)	8 (10%)
65-69	0 (0%)	2 (5.0%)	2 (2.5%)
Mean ± SD	54.90 ±4.094	55.87 ± 4.322	100%

t = 1.036, P> 0.05

Table describes the weight of studied cases. We observed cases in weight range 45-70 kgs. Maximum number of patients (55%) belonged to weight of 55-59 kgs, minimum number of patients were in the weight range of 65-70 kgs. The mean weight of group A subjects were observed 54.90±4.094 and group B cases it was 55.87± 4.322 and there was no any significant difference.

Table 3: Height Wise Distribution Of Patients

Height (cm)	No. of Patients		Percentage
	Group A	Group B	
<150	4 (10.0%)	0 (0%)	4 (5.1%)
151-155	13 (32.5%)	9 (22.5%)	22 (27.5%)
156-160	15 (37.5%)	21 (52.5%)	36 (45.0%)
161-165	7 (17.5%)	8 (20.0%)	15 (18.8%)
166-170	0 (0%)	1 (2.5%)	1 (1.3%)
>170	1 (2.5%)	1 (2.5%)	2 (2.5%)
Mean ± SD	155.40± 5.037	157.27 ±3.968	100%

t = 1.84, P> 0.05

This table shows the height of studied cases the patients were in 150-180 cm of height maximum number of patients (45..00%) belonged to the height of 155- 160cm and minimum number of patients (1.3%) belonged to height if 166-170cm. No patients were present in the height range of 175-180cm. The mean height of each group was comparable.

Table 4: Type of Surgery

	No. of Patients		Percentage
	Group A	Group B	
Excision	1 (2.5%)	1 (2.5%)	2 (2.5%)
Exp. Lap	2 (5.0%)	1 (2.5%)	3 (3.8%)
TAH	35 (87.5%)	38 (95.0%)	73 (91.3%)
Vaginal hysterectomy	2 (5.0%)	0 (0%)	2 (2.5%)
Total	40	40	80

This table shows various surgeries performed in both group maximum number of cases were of abdominal hysterectomy (91.3%).

Table 5: Mean Duration Of Surgery

Group	A	B
Duration (Mins)	100.35	92.70
Sfd. Deviation	± 11.493	± 13.595
Total (N)	40	40

This table shows the mean duration of surgery in both studied group. The mean duration of surgery was found 100.35 (± 11.493) for group A cases and 92.70 (± 13.595) for group B cases. Incidentally group A showed slightly higher duration of surgery. (P<0.05)

Table 6: Change In Mean Pulse Rate ± SD

Group	**Preop**	**After Drug Administration**							
		15Min	**30Min**	**1hr**	**2hr**	**4hr**	**6hr**	**8hr**	**10hr**
A	84.78 ±7.413	88.65 ±6.659	92.05 ±7.622	89.53 ±7.67	87.10 ±7.316	84.10 ±6.921	84.28 ±6.824	83.53 ±6.504	82.60 ±6.613

B	81.00 ±7.726	86.65 ± 7.830	90.00 ±7.871	88.10 ±7.775	86.20 ±7.69	84.30 ±6.892	82.98 ±6.658	82.50 ±6.32	81.82 ±6.348

This table shows the changes in mean pulse rate in these groups initially there was a rise in mean pulse rate, later on the mean pulse rate was observed to fall back to near base line values. Four patients in group A developed bradycardia which was statistically insignificant. None of patients in group B had bradycardia.

Table 7: Changes In Mean Systolic Blood Pressure (mmHg) ± SD

Group	Preop	After Drug Administration							
		15Min	30Min	1hr	2hr	4hr	6hr	8hr	10hr
A	123.00 ± 8.794	108.80 ±6.851	101.70 ±15.588	102.50 ±6.106	105.80 ± 7.370	108.20 ±7.481	111.13 ±7.453	113.18 ±7.795	114.95 ±8.000
B	118.85 ±7.882	107.65 ±7.751	109.65 ±5.798	113.30 ±7.297	114.20 ±5.797	117.52 ±6.413	120.65 ±6.200	121.20 ±5.779	122.60 ±5.068

This table shows the changes in mean systolic blood pressure (SBP) in in both studied groups. There was an initial fall in mean systolic blood pressure followed by gradual increase. Five Patients in group A and 1 patient in group B developed hypotension which was statistically insignificant.

Table 8: Change In Mean Respiratory Rate ±SD

Group	**Preop**	**After Drug Administration**							
		15Min	**30Min**	**1hr**	**2hr**	**4hr**	**6hr**	**8hr**	**10hr**
A	17.95 ±1.239	18.30 ±1.324	17.90 ±1.630	17.55 ±1.395	17.75 ±1.373	17.65 ±1.424	17.95 ±1.395	17.85 ±1.231	17.60 ±1.128
B	17.70 ±1.324	18.45 ±1.395	18.05 ±1.535	17.90 ±1.499	17.90 ±1.566	18.15 ±1.528	18.05 ±1.239	17.85 ±1.145	17.60 ±1.215

This table shows the changes in mean respiratory rate in both studied groups. The changes in respiratory rate was not significant in either of the groups.

Table -9: Mean Onset Of Analgesia (Minutes ± SD)

Group	A	B
Onset (min) ± SD	13.65 ±1.27	13.93 ± 1.45
Total	40	40

t = 20.52; P<0.0001

This table shows the mean onset of analgesia in studied groups. Group A observed onset of analgesia 13.65 (± 1.27) min while in group B cases it was found 13.93 (±1.45), which was statistically not significant.

Table 10: Mean Time For Maximum Spread (Minutes ± SD)

Group	A	B
Time for maximum spread ± SD	17.35 ± 1.80	17.78 ± 1.18
Total	40	40

P<0.0001

This table shows the mean time to maximum spread of analgesia in studied group. Group A observed time for maximum spread at 17.35 ± (1.80) min, while group B cases it was 17.78 ± (1.18) min which was statistically not significant.

Table -11: Mean Duration Of Analgesia (Minutes ± SD)

Group	A	B
Duration of Analgesia ± SD	186.0 ± 16.962	188.80 ± 5.393
Total	40	40

P<0.0001

This table shows the mean duration of analgesia in studied group. Group A cases has observed duration of analgesia as 186.0± (16.962) min while in group B cases it was

188.80 ± (3.393). These finding was comparable for both groups.

Table -12: Mean Onset Of Motor Block (Minutes ± SD)

Group	A	B
Onset (Minutes ± SD)	17.5 ± 1.536	17.95 ±1.37
Total	40	40

P<0.0001

This table shows the mean onset of motor block in studied group. Group A observed to onset motor block 17.5± (1.530) min while in group B cases it was 17.95 ± (1.37)min. There was no significant difference.

Table -13: Mean Duration Of Motor Blockade (Minutes ± SD)

Group	A	B
Duration of motor block ± SD	189.70 ±6.892	187.60 ± 6.164
95% confidence		
Total	40	40

t = 1.4; P>0.05.

This table shows mean duration of motor block for studied group. Group A observed duration of motor block 189.70 (± 6.892) min and group B 187.60 ± (6.164) min. There were no significant difference found in both group in mean motor blockade(P>0.05).

Table -14: Total Vas Achieved

Duration of VAS Achieved	Group A	Group B
4th Hour	29 (72.5%)	35 (87.5%)
5TH Hour	11 (27.5%)	4 (10.0%)
6th Hour	0 (0.0%)	1 (2.5%)
7th Hour	0 (0.0%)	0 (0.0%)
8th Hour	0 (0.0%)	0 (0.0%)
Mean ± SD	4.27 ±0.45	4.15 ±0.42

Total VAS score of group A subjects at 4.27 (± 0.45) hour while in group B cases it was 4.15 (± 0.42) which was little higher in group A but statistically not significant.

In group A total VAS (VAS score 4 and above) was achieved in 72.5% cases while in group B 87.5% cases found with VAS score 4 at 4 hour observation, whenever at 5th hour observation group A showed a total VAS achieved in 27.5% cases and 10% in group B. Both group A & B cases had achieved total VAS upto 5th hour observation period which was comparable and statistically not significant.

This shows the total VAS achieved in group A was comparable with group B cases and showing not any significant difference. (P>0.05)

Table -15: Side Effects In Studied Groups

Side Effect	**Group A (n=40)**	**Group B (n=40)**	**Significant**
Bradycardia	3 (7.5%)	0 (0.0%)	t = 1.80; P>0.05
Hypotension	5 (12.5%)	1 (2.5%)	t = 1.73; P>0.05
Nausea	0 (0.0%)	1 (2.5%)	t = 1.01; P>0.05
Vomiting	0 (0.0%)	1 (2.5%)	t = 1.01; P> 0.05

This table shows side effect seen in studied groups, 5(12.5%) cases in group A and 1 (2.5%) case in group B developed hypotension which was statistically insignificant (P>0.05), bradycardia was noted in 7.5% cases in group A than 0% in group B, there were no statistically significant difference.

Discussion

The present study was conducted to compare extradural ropivacaine and bupivacaine in elective gynaecological surgeries.

In our study, it was observed that there was a rise in pulse rate in the initial 15 mins after drug administration in both studied groups and later on fall back to preoperative

values. This observation is similar to the observation **of M.S. Brockway, J Bannister et al (1991)[9] and Sandra Kampe et al (2004)** [10] that the effect on heart rate is not significantly different between the both studied groups.

It was also seen that there was an initial fall in mean systolic blood pressure at 30 mins after the drug administration in the studied groups, which then gradually increased, the fall in mean blood pressure was more in Group A compared Group B. 5 (12.5%) patients in Group A developed hypotension as compared to 1 (7.5%) patient in group B, which was statistically insignificant. This study correlates well with the study conducted by **Argyro Fassoolake et al (2008)** [11] **and Snadra Kampe et al (2004).**[10]

There was no significant difference in this mean respiratory between both studied groups. The changes in the vital parameters of both cardiovascular and respiratory system by difference doses of ropivacaine and bupivacaine were studied by **T. Panayota (2005),**[12] **I. Smet (2007),**[13] **Ivani G (2009)**[14] **& Sukhminder Jit Singh Bajwa (2010).**[15] Their results correlate well with our studies, as heart rate, blood pressure and respiratory rate did not change significantly.

In our study the mean onset of analgesia in group A and group B were 13.65± 1.272 and 13.93 ± 1.45 respectively. There was not much different in the onset times between the both studied groups and was comparable to onset time recorded by **M.S. Brockway et al (1991),**[9] **Ying Y Lee (2007),**[16] **Sukhminder Jit Bajwa (2010).**[15]

The time to maximum spread in Group A was 17.35 ±1.805 and Group B was 17.78 ±1.18 minute respectively. Although the time to maximum spread was slightly shortened in group A compared to group B, it was not statistically significant.

The mean duration of analgesia in group A and group B were 186 ±16.96 and 188.80 ±5.393 min respectively. The difference in the duration between the groups were not statistically significant. This is similar to the findings reported by **MB Wood et al (1993)** [17] **and M. Dresner et al (2000).**[18] Our observation also correlates with **Ying Y-Lee et al (2007)**[16] that epidural ropivacaine produces dose dependent analgesia.

The onset of motor block in Group A and Group B were 17.50 ±1.536 and 17.95 ±1.37 minute respectively. This observation correlates with study of **M.S. Brockway et al (1991)** [9] **and Scott D.A. et al (1995)**.[19] Duration of motor block in group A and group B were 189.70 ±6.892 and 187.60 ±6.164 respectively, there was not significant difference in the onset times between both studied group and this is also similar to finding suggested by **M.B. Wood**[17] **and M.S. Brockway et al.**[9]

Pain was assessed by VAS score and rescue analgesic was given when VAS>3. The mean VAS score was little higher for group A at 5 hrs than Group B, but mean VAS score between both groups were found not to be statistically significant. Our observation correlates with the findings of **M.S. Brockway et al (1991)** [9] **and Ruth Landau et al (2002).**[20]

In our study we observed that the incidence of side effects like hypotension was 12.5% (5 patients) in group A cases as compared to 2.5% (1 patient) in group B and bradycardia developed in 7.5% (3 Patients) cases in group A than 0% cases in Group B, this shows that hypotension and bradycardia was more in Group A than in Group B cases, but it was not statistically significant, which correlates with study of **K. Knudsen et al**[21] **and Sandra Kampe et al.**[10] The incidence of nausea and vomiting was also similar in both groups and it was not statistically

significant. No other side effects of local anaesthetic were seen in any of the patients in both studied groups.

No complication was noted in our study regarding technique of epidural puncture, catheter insertion or removal. **Dawkins**[22] made a review of 350 papers and noted that major side effects of epidural were accidental dural puncture 2.5%, total spinal block 0.2%, intravascular injection 2.8% and substantial hypotension 1.8%.

Ropivacaine is a long acting, enantiomerically pure (S-enantiomer) amide local anaesthetic, with a high PKa and low lipid solubility which blocks nerve fibers involved in pain transmission (A delta and C fibres) to a greater degree than those controlling motor function (A Beta Fibres). The drug is less cardiotoxic than equal concentration of racemic bupivacaine. In vitro had a significantly threshold for CNS toxicity than racemic bupivacaine in healthy volunteers (mean maximum tolerated unbound arterial plasma concentration were 0.56 and 0.3mg/l respectively).

Since its clinical introduction in 1996, it has been the focus of intense interest, because of its increased CNS and cardiovascular safety compared with bupivacaine. **Hansen TG,**[23] reviews the pharmacology of ropivacaine compared with bupivacaine (the drug of choice for many years), ropivacaine is equally effective for subcutaneous infiltration epidural for subcutaneous infiltration epidural, intrathecal and peripheral nerve block surgery and obstetrics and postoperative analgesia. Ropivacaine is virtually identical to bupivacaine in terms of onset, quality and duration of sensory block, but seems to produce less motor blockade the lesser toxicity of ropivacaine compared to bupivacaine has been confirmed in numerous animal experiment as well as human studies, including studies considering the presumed lower potency of ropivacaine. So far, the increased cost of ropivacaine compared with bupivacaine has limited its wider clinical use inspite of improved safety profile. During the last few years, cost differences between bupivacaine and ropivacaine have been minimized, thus making pharmacoeconomical speculations a much lesser concern when choosing a local anesthetic drug. In conclusion, ropivacaine appears to be safer local anaesthetic agent than bupivacaine. Ropivacaine should be considered when regional blocks are used in neonates and young infants.

Ropivacaine is well tolerated regional anaesthetic with an efficacy broadly similar to that of bupivacaine. However, it may be preferred option because of its reduced CNS and cardiotoxic potential.

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