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A Randomised Controlled Study Comparing The Analgesic Efficacy Of Thoracic Epidural Analgesia Versus Ultrasound Guided Rectus Sheath Block For Midline Laparotomy Surgery

[1]Dr. J. Arul, [2]Dr. K. Senthil Kumar, [3]Dr. S.R Karthick
[1,2,3]Senior Assistant Professor(s),
Department Of Anesthesiology & Critical Care,
Government Stanley Medical College & Hospital, Chennai, Tamil Nadu India

***Corresponding Author:**
Dr. J. Arul
Senior Assistant Professor, Department Of Anesthesiology & Critical Care. Government Stanley Medical College & Hospital, Chennai, Tamil Nadu India

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Abstract

Introduction: The use of multimodal analgesia techniques to facilitate the patient with adequate analgesia for laparotomy surgeries involving midline incisions extending anywhere between xiphisternum and pubic symphysis had been used, to reduce the perioperative use of opioids and its ill effects. With the advent of Ultrasound guidance, the anaesthesiologists now are reconsidering old techniques for extensive clinical use. The rectus sheath block (RSB) is an old but useful technique, under-utilized in the adult population.

Aim Of The Study: To compare the analgesic efficacy of USG guided Rectus Sheath Block with Thoracic Epidural Analgesia for postoperative pain management following midline laparotomy surgery.

Materials & Methods : This study was conducted at Government Stanley Medical College hospital, Chennai on 100 patients who underwent midline laparotomy surgery in the year 2020.This study is a randomized prospective interventional clinical trial. Randomisation was done by allocating the patients to either the Rectus Sheath Block group (Group RSB) or Thoracic Epidural Analgesia group (Group TEA) by draw of lots. Study was an observer blinded study. The patients who met the inclusion and exclusion criteria were only included in the study. Patients were divided into two groups of 50 each.Group RSB: Patients receiving Rectus Sheath Block, Group TEA: Patients receiving Thoracic Epidural Analgesia. On the day of surgery patient was shifted to the pre medication room. 18 gauge IV line was secured and ringer lactate was started at 2ml /kg /hr. Patient was given premedication with Inj. Glycopyrrolate (0.05 mg/kg) IM and injection midazolam (0.05 mg/kg) IM. Patients were connected to the monitors NIBP, ECG, SpO2 after shifting the patient to the Operation Theatre. All the baseline hemodynamic parameters were noted.

Results : 9 patients in Group RSB and 12 patients in Group TEA had physical status of ASA 1. Whereas ASA physical status of 3 was in 11 and 12 patients in Group RSB and Group TEA respectively. P value was statistically not significant. Postoperative pain scores were measured using visual analogue scores in a 0-10cm scale. The visual analogue scores were compared between the two groups, Group RSB and Group TEA, VAS scores were measured at 15minutes, 30 minutes, 2 hours, 4 hours, 8 hours, 16 hours, 24 hours, 30 hours, 36 hours and 48 hours. The visual analogue scores over the entire 48 hours were comparable between the two groups. The average VAS scores at 15 minutes, 30 minutes, 2 hours, 4 hours, 8 hours, 16 hours, 24 hours, 30 hours, 36 hours and 48 hours for both Group RSB and Group TEA .The p-value between the two groups over the entire 48 hours in the postoperative period was not statistically significant. There was a decrease in pulse rate in Group TEA at all time intervals compared to Group RSB, The p-value was significant at 15 min,16

hours, 30hours, 36 hours, and 48 hours. The p-value was found to be statistically significantly at all time intervals beween systolic & diastolic pressure. MAP was measured over the entire 48 hours postoperative period, at specified time intervals. The mean arterial pressure was found to be lower in Group TEA than Group RSB at all time intervals The P – value was found to be statistically significant, at 30 min, 2 hours, 8 hours, 16 hours and at 30 hours. Rescue antiemetic was given if nausea score ≥ 2. Nausea score of 2 was in 13 patients in group RSB and vomiting was present in 3 patients. Nausea score of 2 was in 11 patients in Group TEA and 6 patients had vomiting . P value was found to be not significant. Out of 50 patients in Group RSB, 13 of them required rescue analgesics, and in Group TEA also 11 patients required rescue analgesics. P value was found to be statistically insignificant.

Conclusion: The randomised controlled study conducted to compare the analgesic efficacy of Ultrasound guided rectus sheath block with thoracic epidural analgesia for postoperative pain relief in midline laparotomy surgeries concluded that ultrasound guided RSB is comparable to epidural analgesia. USG guided RSB can be an effective alternative and is easier to learn and less invasive technique compared to epidural analgesia, USG guided RSB would play an important part of the postoperative analgesia regimen, devoid of the side effects of epidural anaesthesia**.**

Keywords: Postoperative Analgesia, Rectus Sheath Analgesia, Midline Incision Abdominal Surgery, Thoracic Epidural Analgesia

Introduction

Midline laparotomy surgery is done commonly in our institution. Pain associated with laparotomy causes undue distress and is injurious to the patient. In addition to the pain being physically and emotionally incapacitating, it is accompanied with several physiological effects which augment the perioperative stress response. [1]The postoperative pain prevents early ambulation of the patient, thus making them prone to deep vein thrombosis, pulmonary atelectasis, muscle wasting and urinary retention that ultimately contributes to increased morbidity, increased length of hospital stay and at times even mortality. Adequate postoperative analgesia is essential to prevent complications such as systemic hypertension, myocardial ischemia or infarction, cardiac arrhythmias, respiratory compromise, pneumonia, postoperative ileus and delayed wound healing.Moreover, the severity of acute pain may lead on to distressing postsurgical chronic pain.[2] Pain after laparotomy is more pronounced in the first 48 hours postoperatively and is aggravated during mobilisation or coughing, than during rest.[3]Epidural analgesia is a recognised technique which is considered as the gold standard in the management of postoperative pain.[4] Epidural analgesia is commonly used in perioperative and postoperative period. It has been demonstrated to improve postoperative outcome and attenuate the physiological stress response in the postsurgical period. But the technique of epidural analgesia is not without complications which may include postdural puncture headache, total spinal anaesthesia, seizures due to unintentional vascular injections, epidural hematoma and epidural abscess. Moreover, physiological side effects such as hypotension, motor blockade, and urinary retention are not uncommon.[5]The use of multimodal analgesia techniques to facilitate the patient with adequate analgesia for laparotomy surgeries involving midline incisions extending anywhere between xiphisternum and pubic symphysis had been used, to reduce the perioperative use of opioids and its ill effects.[6] With the advent of Ultrasound guidance, the anaesthesiologists now are reconsidering old techniques for extensive clinical use. The rectus sheath block (RSB) is an old but useful technique, under-utilized in the adult population.T[7]he rectus sheath block is an old regional anaesthetic technique but with the advent of long acting local anaesthetic agents and compact portable ultrasound equipment, it has re-emerged as a novel analgesic technique for the management of postoperative pain.[4] The technique aims to block the ventral rami of T_7-T_{12} intercostal nerves that innervate the rectus abdominis muscles and overlying skin.[8] It is a compartmental block done by injecting local anaesthetic into the potential

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space between the rectus muscle and the posterior rectus sheath. By introducing a catheter in situ within this space, the block can be topped up using intermittent bolus at regular intervals or continuous infusion of local anaesthetics.[9,10]

Materials & Methods : This study was conducted at Government Stanley Medical College hospital, Chennai on 100 patients who underwent midline laparotomy surgery in the year 2020.This study is a randomized prospective interventional clinical trial. Randomisation was done by allocating the patients to either the Rectus Sheath Block group (Group RSB) or Thoracic Epidural Analgesia group (Group TEA) by draw of lots. Study was an observer blinded study. The patients who met the inclusion and exclusion criteria were only included in the study. Patients were divided into two groups of 50 each.Group RSB: Patients receiving Rectus Sheath Block, Group TEA: Patients receiving Thoracic Epidural Analgesia. On the day of surgery patient was shifted to the pre medication room. 18 gauge IV line was secured and ringer lactate was started at 2ml /kg /hr. Patient was given premedication with Inj. Glycopyrrolate (0.05 mg/kg) IM and injection midazolam (0.05 mg/kg) IM. Patients were connected to the monitors NIBP, ECG, SpO2 after shifting the patient to the Operation Theatre. **Inclusion Criteria**:All consented patients with,Age: 18 to 65 years,Both genders,Weight: ≥ 50 Kg,ASA: 1, 2 and 3.Midline laparotomy surgery.**Exclusion Criteria**:Patients with known hyper sensitivity to local anaesthetics,Patient refusal,Abnormal coagulation status,Severe systemic illness,Planned transverse or oblique abdominal incision,Skin lesion at site of blockade,Pre-existing chronic pain abdomen,Pregnancy

Stastical analysis : The collected data was analysed with SPSS 16.0 version .To describe about the data descriptive statistics frequency analysis, percentage analysis were used for categorical variables and the Mean and Standard deviation (S.D) were used for continuous variables. To find the significant difference between the bivariate samples in independent groups the unpaired sample t- test was used for normal data and for the skewed data Mann-Whitney U test was used. To find the significance in categorical data Chi-Square test was used. In all the above statistical tools the probability value less than 0.05 is considered as significant level.

Results

Table :1 Age Distribution

Age in years	Group RSB	Group TEA	P value
Mean ± SD	48.26±7.301	46.86±9.368	0.407
			Not significant

Maximum age in Group RSB was 62 yrs and the minimum age was 30 years. Mean age in group RSB was 48.26 years and the standard deviation was 7.301 years. In Group TEA, the minimum age was 24 years,whereas the maximum age in Group E was 65 years. Mean age in Group TEA was 46.86 years. These data were computed using student t-test and the P value was found to be 0.407. This difference is considered to be not statistically significant The number of male patients in Group RSB were 42, whereas the number of female patients were 8. The number of male patients in Group TEA were 37, whereas the female patients were 13 in numbers. The data was computed using chi square test. The two tailed P-value equals 0.220, which is not statistically significant

Table :2 Physical Status

ASA	Group RSB	Group TEA	P value

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1	9	12	0.423
2	30	26	
3	11	12	Not significant

9 patients in Group RSB and 12 patients in Group TEA had physical status of ASA 1. Whereas ASA physical status of 3 was in 11 and 12 patients in Group RSB and Group TEA respectively. P value was statistically not significant.

Table :3 Vas Scoring

TIME	GROUP RSB	GROUP TEA	P value
15min	3.12±1.769	2.92±1.510	1.000
30min	3.18±1.976	3.04±1.702	0.788
2hrs	3.14±1.498	2.80±1.429	0.160
4hrs	3.06±1.376	2.82±1.240	0.482
8hrs	3.10±1.389	2.82±0.873	0.571
16hrs	3.08±1.353	2.92±1.066	0.779
24hrs	2.76±1.648	2.44±1.163	0.621
30hrs	2.40±1.294	2.06±0.956	0.153
36hrs	2.80±0.808	2.58±0.609	0.217
48hrs	2.18±1.024	2.24±0.797	0.521

Postoperative pain scores were measured using visual analogue scores in a 0-10cm scale. The visual analogue scores were compared between the two groups, Group RSB and Group TEA, VAS scores were measured at 15minutes, 30 minutes, 2 hours, 4 hours, 8 hours, 16 hours, 24 hours, 30 hours, 36 hours and 48 hours. The visual analogue scores over the entire 48 hours were comparable between the two groups. The average VAS scores at 15 minutes, 30 minutes, 2 hours, 4 hours, 8 hours, 16 hours, 24 hours, 30 hours, 36 hours and 48 hours The p-value between the two groups over the entire 48 hours in the postoperative period was not statistically significant.

Table :4 Pulse Rate

TIME	Group RSB Mean±SD	Group TEA Mean±SD	P value	Significance

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15min	87.72±11.036	83.12±11.689	0.046	Significant
30min	86.86±11.920	83.46±11.920	0.157	Not Significant
2hrs	85.94±9.310	83.56±10.605	0.236	Not Significant
4hrs	84.08±8.305	82.70±9.416	0.439	Not Significant
8hrs	84.36±8.420	81.92±7.811	0.136	Not Significant
16hrs	83.92±8.659	80.56±8.212	0.049	Significant
24hrs	82.42±7.921	80.84±8.904	0.351	Not Significant
30hrs	82.60±7.225	79.60±7.902	0.050	Significant
36hrs	80.92±6.327	78.28±7.088	0.052	Significant
48hrs	81.16±5.108	78.38±5.566	0.011	Significant

Pulse rate was monitored over a period of 48 hours, in the postoperative period in both Group RSB and Group TEA, at intervals of 15 minutes, 30 minutes, 2 hours, 4 hours, 8 hours, 16 hours, 24 hours, 30 hours, 36 hours and 48 hours.There was a decrease in pulse rate in Group TEA at all time intervals compared to Group RSB, The p-value was significant at 15 min,16 hours, 30hours, 36 hours, and 48 hours.

Table :5 Systolic Blood Pressure:

TIME	**Group RSB Mean±SD**	**Group TEA Mean±SD**	**P value**	**Significance**
15min	126.00±8.281	122.32±10.539	0.055	Significant
30min	122.08±7.703	113.68±12.655	0.001	Significant
2hrs	121.46±7.195	115.72±10.637	0.002	Significant
4hrs	122.32±6.763	118.40±7.091	0.006	Significant
8hrs	122.94±6.422	118.18±11.215	0.011	Significant
16hrs	122.50±7.731	118.78±7.547	0.017	Significant
24hrs	121.46±7.960	119.58±8.320	0.251	Not Significant
30hrs	122.28±7.326	119.12±8.280	0.046	Significant
36hrs	120.62±6.827	119.7±6.550	0.493	Not Significant

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48hrs	120.74±6.931	118.08±5.771	0.040	Significant

Systolic BP was monitored over a period of 48 hours. There was a significant fall in systolic BP over the entire 48 hours in Group TEA except at 24 and 36 hours. The p-value was found to be statistically significantly at all time intervals.

Table :6 Diastolic Blood Presure

TIME	**Group RSB Mean±SD**	**Group TEA Mean±SD**	**P value**	**Significance**
15min	74.63±6.85	68.53±3.709	0.664	Not Significant
30min	75.3±7.87	68.76±4.57	0.174	Not Significant
2hrs	75.15±7.47	70±5.52	0.391	Not Significant
4hrs	74±6.74	70.86±3.342	0.610	Not Significant
8hrs	74±6.08	70.86±3.85	0.193	Not Significant
16hrs	74.3±7.00	70.9±3.462	0.336	Not Significant
24hrs	73.16±5.88	71.1±3.94	0.598	Not Significant
30hrs	72.93±5.28	71.08±3.919	0.348	Not Significant
36hrs	73.26±6.06	71.36±3.53	0.785	Not Significant
48hrs	73.65±6.334	71.31±3.74	0.584	Not Significant

Diastolic BP was measured over the 48 hours postoperative period, at specified time intervals. The mean diastolic blood pressure was found to be lower in Group TEA than Group RSB at all time intervals But the P value was found to be statistically not significant at all time intervals.

Table :7mean Arterial Presure:

TIME	**GROUP RSB mean±SD**	**GROUP TEA mean±SD**	**P value**	**Significance**
15min	92.29±5.48	91.43±6.07	0.455	Not Significant
30min	89.80±6.19	85.61±8.05	0.004	Significant
2hrs	89.27±5.35	86.56±7.30	0.037	Significant
4hrs	89.32±5.17	87.63±4.35	0.080	Not Significant

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8hrs	89.66±4.92	87.13±5.32	0.015	Significant
16hrs	89.74±5.42	87.74±4.65	0.050	Significant
24hrs	88.94±4.63	87.94±3.59	0.270	Not Significant
30hrs	89.17±4.10	87.51±4.23	0.048	Significant
36hrs	88.70±4.76	88.21±4.07	0.579	Not Significant
48hrs	88.91±4.80	87.91±3.92	0.580	Not Significant

MAP was measured over the entire 48 hours postoperative period, at specified time intervals. The mean arterial pressure was found to be lower in Group TEA than Group RSB at all time intervals as depicted in Table 11/ figure 31. The P – value was found to be statistically significant, at 30 min, 2 hours, 8 hours, 16 hours and at 30 hours.

Table 8: Post Operative Nausea And Vomiting

PONV SCORE	Group RSB	Group TEA	P value
0	18	22	0.477 Not Significant
1	16	11	
2	13	11	
3	3	6	

Postoperative nausea and vomiting scores were measured over the 48hours. The scores were: No nausea = 0, mild nausea = 1, moderate nausea = 2, vomiting = 3. Rescue antiemetic was given if nausea score ≥ 2. Nausea score of 2 was in 13 patients in group RSB and vomiting was present in 3 patients. Nausea score of 2 was in 11 patients in Group TEA and 6 patients had vomiting . P value was found to be not significant.

Table 9 Rescue Analgesic Requirement

	GROUP RSB	GROUP TEA	P value
NO	37	39	0.640 Not significant
YES	13	11	

Rescue analgesics were provided when Visual Analogue Score (VAS) scores ≥ 4, or on patient demand. Out of 50 patients in Group RSB, 13 of them required rescue analgesics, and in Group TEA also 11 patients required rescue analgesics. P value was found to be statistically insignificant.

Discussion

Midline laparotomy is performed commonly as elective or emergency surgery. Pain associated with these surgeries have considerable pain postoperatively which needs to be addressed. A good postoperative analgesic regimen is important to alleviate stress response in the postoperative period to improve the postoperative outcomes. Adequate

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postoperative analgesia facilitates earlier patient mobilisation and accelerates recovery.Pain after laparotomy is more noticeable in the first two postoperative days. The pain is aggravated during mobilisation or coughing. Patients undergoing laparotomy are usually managed with intravenous opioids for postoperative analgesia. But systemic opioids provide analgesia when patient is at rest. [11]Analgesia even on movement or coughing is provided essentially by regional anaesthesia techniques in the postoperative period. The gold standard technique that has been used for postoperative pain relief is epidural analgesia. With the advent of ultra-sonogram, truncal nerve blocks are gaining popularity. One of the most promising USG guided truncal nerve blocks used for postoperative pain relief in laparotomy is the rectus sheath block (RSB).While there are various studies comparing epidural analgesia with conventional intravenous opioids and USG guided RSB with systemic opioids for post-operative pain relief, there are only very few studies comparing epidural analgesia with USG guided rectus sheath block.[12]We conducted this randomized prospective observer blinded clinical study to compare the analgesic efficacy of USG guided rectus sheath with thoracic epidural analgesia for post-operative pain relief in patients undergoing midline laparotomy surgery under general anaesthesia.[13] In this study we planned to test the hypothesis that USG guided rectus sheath block would provide optimal post-operative analgesia that will be comparable to epidural analgesia.So we conducted a study comparing the pain scores between rectus sheath block (RSB) group and thoracic epidural analgesia (TEA) group over a period of 48 hours. In addition post-operative nausea and vomiting (PONV), patient satisfaction at 48 hours, rescue analgesia with injection tramadol, complications associated with the procedure were evaluated between the 2 groups.[14] The hemodynamic parameter over a period of 48 hours was also compared between RSB group and TEA group. Study was an observer blinded randomised clinical trial. Sample size selected was 100.As far as the inclusion criteria was concerned, patients between the ages of 18-65 years were selected, since extremes of age will be a confounding variable.[15] As far as ASA physical status concerned, ASA-PS, ASA-PS II and ASA-PS III patients were included in the study.Patients who were excluded from the study were, patients with known hypersensitivity to local anaesthetics, patients with abnormal coagulation status, pregnancy and patients with severe systemic illness Since Group TEA patients received epidural analgesia, patients with abnormal coagulation status and those with skin lesion at the site of blockade were excluded from the study.Patients from both the groups were analysed for the demographic profile. Patients mean age and standard deviation were comparable between the RSB group and TEA group. Sex distribution were also comparable.[16] The mean weight were similar between the two groups and the p-value computed using student t-test was insignificant. So the demographic profile as computed by student t-test and Chi-square test were similar between the RSB group and the TEA group.In Group TEA the epidural catheter was placed before the induction of general anaesthesia. 16G Tuohy needle was used to identify epidural space with loss of resistance technique, using midline approach. In Group RSB the rectus sheath catheters were placed after the induction of general anaesthesia and before the surgical incision. USG guided rectus sheath block was performed using high frequency, linear array USG probe (6-12MHz). [17]The Linear array probe was positioned transversely to identify the rectus muscle, then probe was moved laterally. Then using USG guidance a 16G Tuohy needle was inserted in an in-plane technique to locate the plane between the rectus muscle and the posterior rectus sheath.16G Tuohy needle was clearly distinct under real time USG. One factor which undoubtedly defines thesuccess rate of the block was clear visualisation of the needle tip at all time during the block.Real time visualisation of the expansion of rectus sheath plane, was done by injecting via the Tuohy needle 4-5ml of normal saline. This is defined as the hydro-dissection of the plane between the posterior border of rectus muscle and posterior rectus sheath. [18]Optimal needle location is indicated by the appearance of an “anechoic” fluid collection. Then the epidural catheter is inserted 4-6cm beyond the needle tip into the rectus plane. 20 ml of 0.25% Inj. bupivacaine via rectus sheath catheter was given and continued as intermittent bolus every 6 hours.[19]The local anaesthetic that was used in both the groups was bupivacaine. Bupivacaine is a commonly used drug

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both in epidural analgesia as well as USG guided rectus sheath block. In our study Bupivacaine was given as intermittent boluses in both RSB and TEA groups every 6 hours over a period of 48 hours postoperatively.20 ml of injection 0.25 % bupivacaine was used in each rectus sheath catheters in RSB group patients and was repeated every 6 hours. 10 ml of injection 0.125% bupivacaine was used in TEA group and was repeated every 8 hours.[20]The primary outcome measure that was compared between the RSB group and TEA group, was the pain scores graded by visual analogue scores. The VAS scores were graded on a 0-10 cm scale. VAS scores were observed over a period of 48 hours in the postoperative period. VAS scores were observed at 15 minutes, 30 minutes, 2 hours, 4 hours, 8 hours, 16 hours, 24hours, 30 hours, 36 hours and 48 hours.The mean VAS scores at all the time intervals, measured were comparable between the RSB group and the TEA group. The p-value computed was statistically not significant. So the analgesic efficacy of USG guided RSB as measured by visual analogue pain scores were comparable with thoracic epidural analgesia.[21]One of the secondary outcome measures that were analysed was postoperative nausea and vomiting (PONV). Rescue anti-emetic, Inj. Ondensetron 4 mg intravenously was given when the PONV scores were ≥ 2. Average PONV scores were similar in both the groups. Incidence of vomiting would have been higher if an epidural narcotics were used as additive. However in our study 0.125% bupivacaine was alone used for epidural analgesia as intermittent boluses every 8 hours.The next outcome measured was postoperative satisfaction score. A score of 4 which meant excellent postoperative satisfaction was recorded in 22 patients in Group RSB compared to 26 patients in group TEA. The mean postoperative satisfaction was slightly better in the Epidural group. This may be because of the vague underlying dull visceral pain in the RSB group.[22]Rescue analgesia was given as per the patient requirement and on patients demand. Rescue analgesia was given if VAS scores were greater than or equal to 4. Injection ondansetron 4 mg was given before administering Inj.Tramadol 100 mg. Rescue analgesia was required in 13 of the 60 patients in the RSB group and 11 of the 50 patients in the TEA group. So requirement of rescue analgesia was comparable in both the groups.[23]There was no incidence of bradycardia, respiratory depression, urinary retention in both the groups, but there was significant hypotension in the epidural group. 10 out of the 50 patients had hypotension that is defined as mean arterial pressure < 20% from baseline values. Episodes of hypotension were treated with fluid boluses of normal saline or ringer lactate. Patients who do not respond to crystalloids were to be given injection ephedrine. But all patients responded to fluid boluses. Physiological effect of sympathetic blockade was the reason behind this hypotension in TEA group.[24] But there was no incidence of hypotension reported in the RSB group.As far as the hemodynamic parameters are concerned there was a significant fall in systolic blood pressure and mean arterial pressure at periodic time intervals after activation of epidural catheter. So we concluded that USG guided TAP block was comparable to epidural analgesia in terms of post-operative pain relief. However in the epidural group incidence of hypotension was significant.[25]Adverse effects of epidural analgesia include unintentional dural puncture, transient neuropathy, spinal hematoma, CNS infections moreoverintrathecal or intravascular catheter migration can lead on to disastrous complications. Hypotension is present in epidural anaesthesia due to sympathetic blockade. Lower limb motor block is uncommon when using low concentrations of bupivacaine but when present can restrict early ambulation of the patient. Urinary retention is seen when sacral segments S2 to S4 are blocked by epidural analgesia.[26]Advantages of this USG guided RSB include optimal analgesia without the significant risk associated with neuraxial blocks especially when patients are on drugs which affect the coagulation such as aspirin, clopidogrel, heparin and others. [27]Also in the setting of sepsis RSB can be judiciously used with minimal risk whereas epidural is contraindicated in such situations. Unlike in epidural, during insertion of the rectus sheath catheters, patient need not be accurately positioned and the procedure can be done after the induction of general anaesthesia which avoids the patients' discomfort. RSB has no significant haemodynamic effects which allows this technique to be used safely in patients presenting with hypotension either due to hypovolemia or sepsis in emergency situations.[28]Adding adjuvants to the local

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anaesthetic in RSB would further enhance the efficacy and duration of the block [29,30].

Conclusion

The randomised controlled study conducted to compare the analgesic efficacy of Ultrasound guided rectus sheath block with thoracic epidural analgesia for postoperative pain relief in midline laparotomy surgeries concluded that ultrasound guided RSB is comparable to epidural analgesia. USG guided RSB can be an effective alternative and is easier to learn and less invasive technique compared to epidural analgesia, USG guided RSB would play an important part of the postoperative analgesia regimen, devoid of the side effects of epidural anaesthesia.

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