Outcome of tap block in the cesarean section on postoperative pain

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ABSTRACT

Background (TAP) is a new method for bilateral blockade of afferent abdominal wall nerves through small lumbar triangles. **Aim** We evaluated its analgesic efficacy in patients within the first 24 hours of pregnant women who underwent caesarean section in a randomized, double-blind clinical trial **METHODS**: 90 pregnant women who underwent cesarean delivery, including patient-controlled analgesics with morphine, were selected; in this paper, the focus was on the extent of the degree of pain to patients who underwent TAP in caesarean section, where information and demographic data were collected from different hospitals in Iraq. Patients were distributed into two groups: 45 patients who underwent TAP and 45 patients' group. The control ages ranged from 20-40 years. **RESULTS:** TAP block reduced visual analogue pain scores (TAP vs. control, mean ± S.D. $p < 0.05$), and at all postoperative time points, including 24 h after surgery. Morphine requirement was also reduced in the first 24 h after surgery, where the mean SD to morphine for the group of patients was 6.78 ± 2.56, while for the control group, it was significantly less than 4.99 ± 1.1.

The prevalence of complications or negative aspects in this study to patients in the TAP group was eight patients, while in the control group, it was for 19 patients and all patients who received TAP reported a high level of satisfaction with the analgesic regimen after surgery.

Keywords: TAP, BMI, VAS, Patients, Satisfaction, Pregnant, Anaesthesia, Postoperative.

Introduction

(TAP) is a technique that produces a peripheral blockade of the nerves of the anterior abdominal wall and provides analgesia from the skin to the parietal peritoneum [1,2,3,4]. In this way, the sensory loss is produced, which passes from the xiphoid process to the pubic symphysis. [5,6]

It is used for postoperative pain management in abdominal surgery involving incisions below the midline, as with caesarean delivery [7,8]

TAP block is a modern technology, which offers a rapid expansion of postoperative local anaesthesia and analgesia, and it is based on injecting a bolus of local anaesthesia in this anatomical space to block the incoming somatic fibres before exiting the TAP. [9,10,11]

The approach described in 2001 by Rafi AN, with anatomical surface references, is described as a mass injection point. This approach has been associated with a significant rate of failure due to the difficulty of the anatomical site, especially in obese patients, and has also been described complications of the patient [12]

In other previous studies, they reviewed seven randomized clinical trials, including a total of 364 patients, 180 of whom had a TAP block. [13,14]

They were applied to the following surgeries: caesarean section (3 trials), open bowel resection, abdominal hysterectomy, laparoscopic cholecystectomy, and open appendectomy. [15]

Six studies used multimodal postoperative analgesia with paracetamol, NSAIDs, and morphine, and in 3 studies, spinal anaesthesia was used with local anaesthesia and opioids during surgery. [16,17]

This study aims to determine the analgesic efficacy of an abdominal transverse mass in the postoperative period of patients undergoing caesarean section. [18,19,20]

TAP ultrasound has been used and evaluated in randomized controlled trials in colorectal surgery, 17, 18 in caesarean section, in cholecystectomy, inguinal hernia, appendectomy, nephrectomy, bariatric surgery, gastrostomy, and has also been used and evaluated in prospective studies In liver transplantation and prostatectomy. [21,22]

It should be noted that TAP should always be performed as an additional component of multimodal analgesia because although it provides analgesia of the skin, subcutaneous peritoneum, and parietal peritoneum, it is not effective in controlling pain in a non-invasive manner. [23]

Patient and method

In this paper, the focus was on the extent of the degree of pain to patients who underwent TAP in caesarean section, where information and demographic data were collected from different hospitals in Iraq, where 90 patients from pregnant women were recruited and distributed into two groups: 45 patients who underwent TAP and 45 patients group the control ages ranged from 20-40 years

After receiving approval from the hospital ethics committee and written informed consent from patients, we enrolled 90 who underwent ASA I-III caesarean section in a prospective, double-blind, randomized clinical trial. Patients were excluded from the study if they had a history of allergy to related medications. The inclusion criteria were patients who were receiving opioid medications for medical reasons and ages ranging from 20-40 years.

Patients, anaesthesiologists, and postoperative care staff were aware of the group assignment. All patients received standardized general anaesthesia. In all cases, standard monitoring, including electrocardiogram, non-invasive measurement of blood pressure, oxygen saturation, and carbon dioxide monitoring, was used as all patients received morphine 6.78 ± 2.56 mg/kg, and diclofenac 77.21 ± 61.4

These studies were conducted in the PACU at 2, 4, 6, and 24 hours after surgery. All patients were asked to rate their pain at rest and during movement, they were also asked to report the presence and extent of nausea during these time steps, and pain intensity was assessed using a visual analog scale (0 = no pain, ten = the most imaginable)

Statistical analysis was performed using standard statistical software (SPSS, Sigma Stat©, version 2.0 Jandel Scientific, Chicago, IL). Demographic data were analysed using SD+MEAN, and repeated measures (number of pain, number of nausea) were analysed by repeated tests ANOVA.

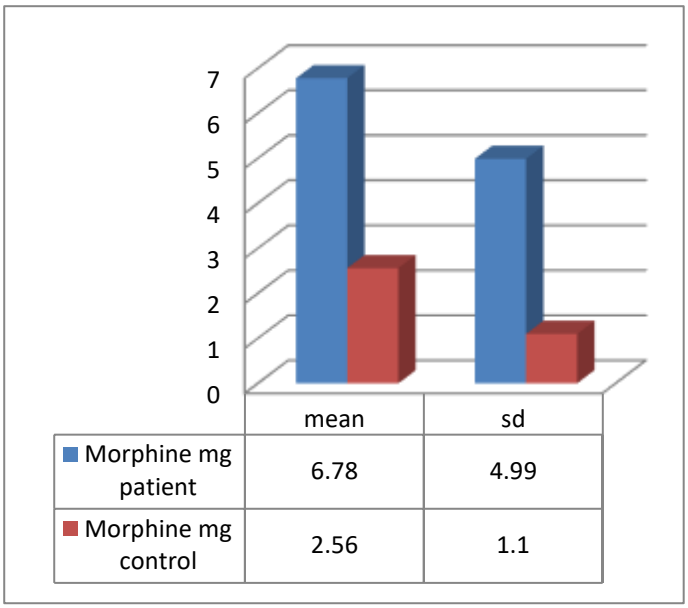
Generally distributed data are presented as means, ± mean deviations oddly distributed data are presented as means ± quartiles (potential deviation), and the level of significance for all analyses is set as $P < 0.05$.

In this study, information and answers to a questionnaire distributed to patients within two months were collected. Patients who underwent TAP for caesarean delivery from 8-5-2020 to 12-8-2021 were collected.

Results

Table 1- Characteristics of demographic results of patient

Items	Patient, N=45	Control, N=45	P-value
Age			
20-24	11	14	0.5
25-29	10	15	
30-34	14	10	
35-40	10	6	
BMI Categories			
22–24.9	4	2	0.85
Overweight = 25-29.9	22	31	0.098
Obesity = BMI of 30 or greater	19	14	0.65
Operation time (min)	46.3±13.9	40.0±8.8	0.01
ASA, n (%)			
1	29	33	0.53
2	16	12	0.44
Additional diseases n (%)	6(13.3)	4 (8.8)	0.77



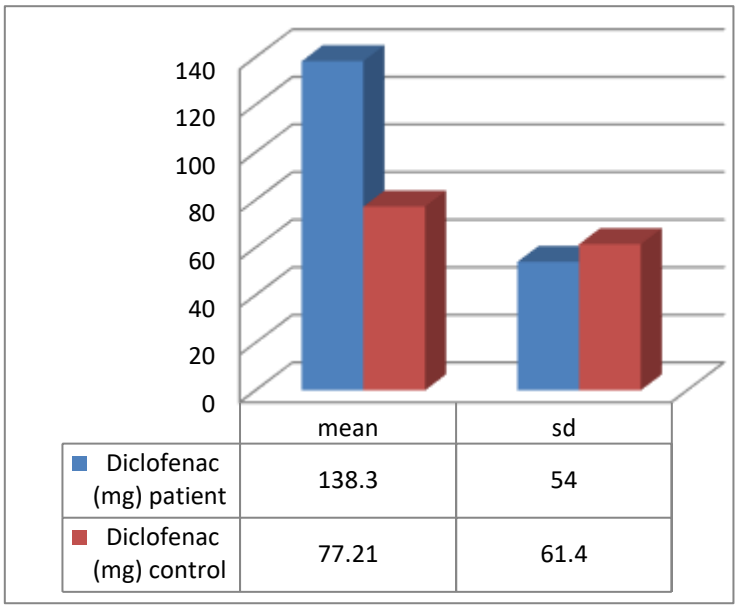


Fig 1 - Patients' consumption of Morphine and diclofenac after surgery

Table 2- Evaluation of side effects to patients through a questionnaire

Variable	TAP group	Control	P-value
depression first score	1	2	0.76
depression second score	2	4	0.065
Sedation first score	0	1	0.05
Sedation second score	1	3	0.088
Nausea and vomiting	3	5	0.01
Pruritus	1	4	<0.001
Total	Eight patient	19 patient	

Table 3- Assessment of the degree of pain to patients according to a visual analogue scale at 24 hr postoperative

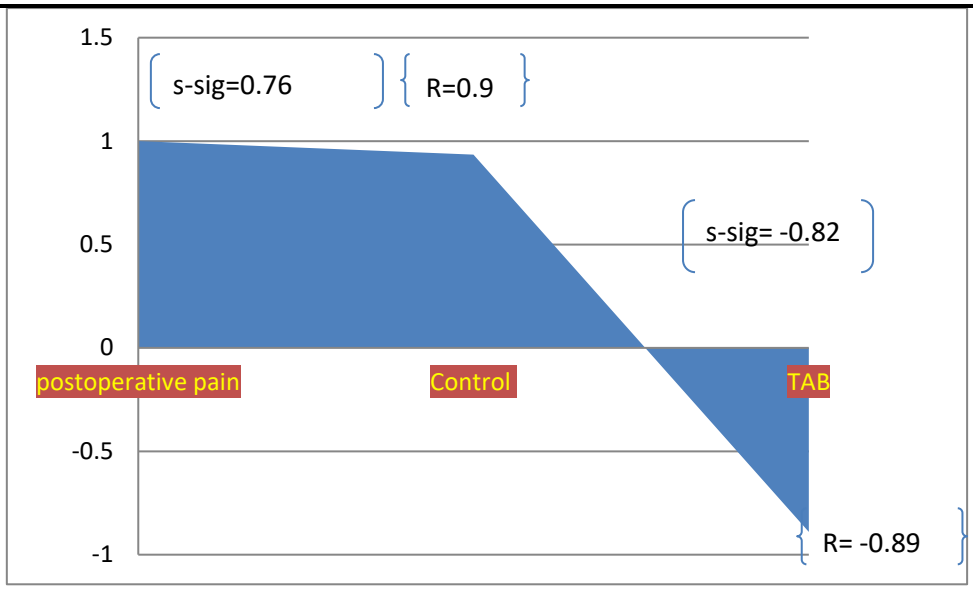
	Control	TAB group
4hr	5	3

8hr	4	2
12hr	4	2
16hr	3	1
18hr	2	1
24hr	1	0

Table 4- MEAN ± SD to assessment a deep breath of the patient at 24 hr postoperative

	Control MEAN ± SD	TAB group MEAN ± SD
4hr	5.1±1.1	3.4±0.7
8hr	4.5±0.9	3.1±0.59
12hr	4.3±0.7	2.8±0.34
16hr	3.6±0.45	1.1±0.34
18hr	2.2±0.44	0.56±0.21
24hr	1.3±0.2	0.4±0.1

Figure 2 - The association between groups of patients with postoperative pain



Discussion

In this study, 90 pregnant women patients who underwent caesarean delivery were recruited, and the study aimed to know the effect of

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The age group ranging from 20-40 years was determined, and the most prevalent ages in this study in the patient group were from 30-34 years for 14 patients, but in the control group, the most frequent ages were from 25-29 to 15 patients, and a high mass index was noted. body to patients aged between 35-40 years, as shown in Table 1

Figure 2 shows Patients' consumption of Morphine and diclofenac after surgery

Where the mean SD to morphine for the group of patients was 6.78 ± 2.56, while for the control group, it was significantly less, 4.99 ±1.1 As for diclofenac for a group of patients, 138.3±54 And the control group has 77.21 ± 61.4 Through a questionnaire distributed to patients, the negative aspects were evaluated to the two groups, and the most frequent complications in this study were

depression, sedation, nausea and vomiting, and pruritus.

In this research, the prevalence of complications was found in the group of patients for 19 patients out of 45. As for the group that underwent the TAP group, the prevalence of complications was found for eight patients, and a statistically significant relationship was observed between the pressure group.

And depression second score with a p-value of 0.065, and sedation first and second score with a p-value of < 0.05, as shown in Table 2.

In Table 3, the assessment of the degree of pain to patients according to a visual analogue scale at 24 hr postoperative

A significant increase in the degree of pain was observed for patients in the second group (the control) and a decrease in the degree of pain for patients who underwent tab as an aesthetic method.

There are also two other randomized controlled trials that have concluded that an abdominal transverse plane block is effective for analgesia after caesarean delivery (9, 10). They are double-blind studies in which a TAP block is performed on a group with local anaesthetic and a control group with saline. It is concluded that there was reduced opioid use and a longer time to claim the first pain reliever, as well as less movement pain and rest for 24 h in the blocking group with local anaesthesia.

Conclusion

We can conclude that the abdominal transverse plane block analgesic technique after caesarean section contributed to an effective intervention to reduce postoperative pain in women, both at rest and in motion, during the first 24 hours. In addition, its use reduces the number of analgesics required in the postoperative period, and it can be said that it is also a technique with few associated complications and is well accepted by women, so it is recommended for use in cases where there are no contraindications.

References

1. Abdallah FW, Halpren SH, Margarido CB. Transversus abdominis plane block for postoperativeanalgesia after Caesarean delivery performed under spinalanaesthesia?A systematic review and meta-analysis. Br J Anaesth. 2012; 109:679–87. [PubMed] [Google Scholar]
2. Young MJ, Gorlin AW, Modest VE, Quraishi SA. Review Article Clinical Implications of the Transversus Abdominis Plane Block in Adults. Anesthesiol Res Pract. 2012; 19:731645. [PMC free article] [PubMed] [Google Scholar]
3. McMorrow RC, Ni Mhuircheartaigh RJ, Ahmed KA, Aslani A, Ng SC, Conrick-Martin I, et al. Comparison of transversus abdominis plane block vs. spinal morphine for pain relief after Caesarean section. Br J Anaesth. 2011; 106:706–12. [PubMed] [Google Scholar]
4. Chaney MA. Side-effects of intrathecal and epidural opioids. Can J Anaesth. 1995; 42:891–903. [PubMed] [Google Scholar]
5. Kanazi G, Aouad M, Abdallah F, Khatib MI, Adham AM, Harfoush DW, et al. The analgesic efficacy of subarachnoid morphine in comparison with ultrasound-guided transversus abdominis plane block after cesarean delivery: a randomized controlled trial. Anesth Analg. 2010; 111:475–81. [PubMed] [Google Scholar]
6. Mizra F, Carvalho B. Transversus abdominis plane blocks for rescue analgesia following Cesarean delivery: A case series. Can J Anaesth. 2013; 60:299–303. [PubMed] [Google Scholar]
7. Onishi Y, Kato R, Okutomi T, Unno N. Transversus abdominis plane block provides postoperative analgesic effects after cesarean section: Additional analgesia to epidural morphine alone. J Obstet Gynaecol Res. 2013; 39:1397–405. [PubMed] [Google Scholar]
8. Farooq M, Carey M. A case of liver trauma with a blunt regional anesthesia needle while performing transversus abdominis plane block. Reg Anesth Pain Med. 2008; 33:274–5. [PubMed] [Google Scholar]
9. Lancaster P, Chadwick M. Liver trauma secondary to ultrasound-guided transversus abdominis plane block. Br J Anaesth. 2010; 104:509–10. [PubMed] [Google Scholar]
10. Bollag, L.; Richebe, P.; Siaulys, M.; Ortner, C.M.; Gofeld, M.; Landau, R. Effect of transversus abdominis plane block with and without clonidine on post-cesarean delivery wound hyperalgesia and pain. Reg. Anesth. Pain Med. 2012, 37, 508–514. [CrossRef]
11. Canakci, E.; Gultekin, A.; Cebeci, Z.; Hanedan, B.; Kilinc, A. The Analgesic Efficacy of Transverse Abdominis Plane Block versus Epidural Block after Caesarean Delivery: Which One Is Effective? TAP Block? Epidural Block? Pain Res. Manag. 2018, 2018, 3562701. [CrossRef]
12. Canovas, L.; Lopez, C.; Castro, M.; Rodriguez, A.B.; Perez, L. Contribution to post-cesarean analgesia of ultrasound-guided transversus abdominis plane block. Rev. Esp. Anestesiol. Reanim. 2013, 60, 124–128. [CrossRef]
13. Chandon, M.; Bonnet, A.; Burg, Y.; Barnichon, C.; DesMesnards-Smaja, V.; Sitbon, B.; Foiret, C.; Dreyfus, J.F.; Rahmani, J.; Laloe, P.A.; et al. Ultrasound-guided Transversus Abdominis plane block versus

continuous wound infusion for post-cesarean analgesia: A randomized trial. PLoS ONE 2014, 9, e103971.
14. Corsini, T.; Cuvillon, P.; Forgeot, A.; Chapelle, C.; Seffert, P.; Chauleur, C. Single-dose intraincisional levobupivacaine infiltration in caesarean postoperative analgesia: A placebo-controlled double-blind, randomized trial. Ann. Fr. Anesth. Reanim. 2013, 32, 25–30. [CrossRef]
15. Costello, J.F.; Moore, A.R.; Wieczorek, P.M.; Macarthur, A.J.; Balki, M.; Carvalho, J.C. The transversus abdominis plane block, when used as part of a multimodal regimen inclusive of intrathecal morphine, does not improve analgesia after cesarean delivery. Reg. Anesth. Pain Med. 2009, 34, 586–589. [CrossRef] [PubMed]
16. Demiraran, Y.; Albayrak, M.; Yorulmaz, I.S.; Ozdemir, I. Tramadol and levobupivacaine wound infiltration at cesarean delivery for postoperative analgesia. J. Anesth. 2013, 27, 175–179. [CrossRef] [PubMed]
17. Onishi, Y.; Kato, R.; Okutomi, T.; Tabata, K.-I.; Amano, K.; Unno, N. Transversus abdominis plane block provides postoperative analgesic effects after cesarean section: Additional analgesia to epidural morphine alone. J. Obstet. Gynaecol. Res. 2013, 39, 1397–1405. [CrossRef]
18. Ekmekçi, P.; Ça ˘glar, G.S.; Yilmaz, H.; Kazbek, B.K.; Gursoy, A.Y.; Kiseli, M.; Tüzüner, F.; Yılmaz, H.; Gursoy, A.Y. Effects of different doses of tramadol added to levobupivacaine in continuous wound infusion for postoperative pain treatment following cesarean section. J. Matern. Neonatal Med. 2016, 30, 343–346. [CrossRef] [PubMed]
19. Mohamed, A.Z.E.A. Assessment of the analgesic potency of ropivacaine 0.2% versus ropivacaine 0.5% in transversus abdominis plane block after cesarean delivery. Egypt. J. Anaesth. 2016, 32, 385–390. [CrossRef]
20. Aly, M.; Ibrahim, A.; Farrag, W.; Abdelsalam, K.; Mohamed, H.; Tawfik, A. Pruritus after intrathecal morphine for cesarean delivery: Incidence, severity and its relation to serum serotonin level. Int. J. Obstet. Anesthesia 2018, 35, 52–56. [CrossRef] [PubMed]
21. Kintu, A.; Abdulla, S.; Lubikire, A.; Nabukenya, M.T.; Igaga, E.; Bulamba, F.; Semakula, D.; Olufolabi, A.J. Postoperative pain after cesarean section: Assessment and management in a tertiary hospital in a low-income country. BMC Health Serv. Res. 2019, 19, 68. [CrossRef]
22. Joshi, G.; Gandhi, K.; Shah, N.; Gadsden, J.; Corman, S.L. Peripheral nerve blocks in the management of postoperative pain: Challenges and opportunities. J. Clin. Anesth. 2016, 35, 524–529. [CrossRef]
23. Viera, A.J.; Garrett, J.M. Understanding interobserver agreement: The kappa statistic. Fam. Med. 2005, 37, 360–363. 118. Hozo, S.P.; Djulbegovic, B.; Hozo, I. Estimat.