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ULTRASOUND-GUIDED TRANSVERSUS ABDOMINIS PLANE BLOCK AS AN EFFECTIVE METHOD FOR POST-CESAREAN PAIN MANAGEMENT IN RURAL AREAS

By

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ABSTRACT

Background: Inadequate post-cesarean delivery (Post-CS) pain may delay early convalescence and increase the incidence of complications with prolonging hospital stay.

Objectives: To compare the efficiency of Ultrasound-guided Transversus Abdominis Plane (USG-TAP) block to intravenous patient-controlled analgesia (IV-PCA) for management of post-cesarean delivery pain in rural areas.

Method: One hundred ASA I and II women assigned for CS were divided into USG-TAP block group and IV-PCA morphine group. USG-TAP block was performed using 0.25% isobaric bupivacaine 15-ml on both sides, and IV-PCA morphine group received basal infusion of 1 mg/hr, 1.5 mg bolus with 10-min lockout interval. Outcomes included postoperative (PO) visual analogue scale (VAS) pain scores determination, 24-hr total opioid consumption and frequency of sedation, nausea and vomiting.

Result: PO pain VAS scores and frequency of rescue analgesia requests showed non-significant difference between groups. However, the difference

in frequency of PO sedation was significantly higher, while frequency of nausea and vomiting was non-significantly different between both groups.

Conclusion: In rural areas, for Post-CS pain management, USG-TAP block is an effective method as IV-PCA and relatively safe procedure.

INTRODUCTION

Cesarean delivery (CD) is the most common surgical procedure undertaken in Egypt and according to WHO report; CD rate has doubled from 20% to be 51.8% in the period between 2005 and 2014. In fact, inadequate postoperative pain management after CD may delay early breastfeeding and possibly leads to hamper early ambulation, increasing the incidence of deep vein thrombosis (DVT), causing respiratory complications with prolonged hospital stay. Inadequate health care system and lack of resources are responsible for this inadequacy (McDonnell et al., 2009).

The use of opioid, systemically or regionally, usually is associated with many adverse effects. Therefore, transversus abdominis plane (TAP) block is used for decreasing the opioid needs (Elkassabany et al., 2013).

TAP block was firstly introduced in 2001 by Rafi as an anatomical landmark blind technique for blocking T10 to T1 (Rafi 2001). In 2007, ultrasound-guided (USG) TAP block became the standard technique as it reduces the failure rate and real-time injection (Farooq and Carey 2008).

This study aimed to compare efficiency of USG-TAP block to IV patient-controlled analgesia (IV-PCA) for PO pain management after CD.

Methodology

After obtaining approval from Benha University Ethical Committee, and a written informed consent, one hundred ASA I and II patients posted for CD were included in a prospective, randomized and controlled clinical trial between 2014 and 2015. Patients who refused, required GA, had BMI >35, or with a history of local anesthetic allergy were excluded from the study. Patients were randomly divided, with a computer assistant, into USG-TAP block group and IV-PCA morphine group.

Standard monitoring (ECG, NBP, and SP_{O_2}) and sitting position spinal an-

esthesia by 10-12 mg 0.5% hyperbaric bupivacaine were initiated. All patients received paracetamol 1000 mg at end of CD; 50 patients underwent USG-TAP block with 15ml 0.25% isobaric bupivacaine on sides (Fig. 1), and patients of IV-PCA morphine group received background basal infusion 1mg/hour, 1.5 mg bolus and lockout interval of ten minutes.

Study outcomes included:

1. Determination of pain score using the visual analogue scale (VAS) 2, 4, 6, 8, 12, 24-hr PO. Rescue analgesia was given in the form of IM diclofenac sodium 75 mg when VAS pain scores exceeded 4.
2. The 24-hr PO total opioid consumption
3. The 24-hr PO frequency and scoring of
 - PO sedation as follows: 0= patient is fully awake; 1= slightly sedated, 2= sleep but responds to voice
 - Nausea and vomiting: 0= no nausea/vomiting, 1= nausea only, 2= vomiting. Metoclopramide 10 mg was given intravenously when nausea or vomiting occurred.

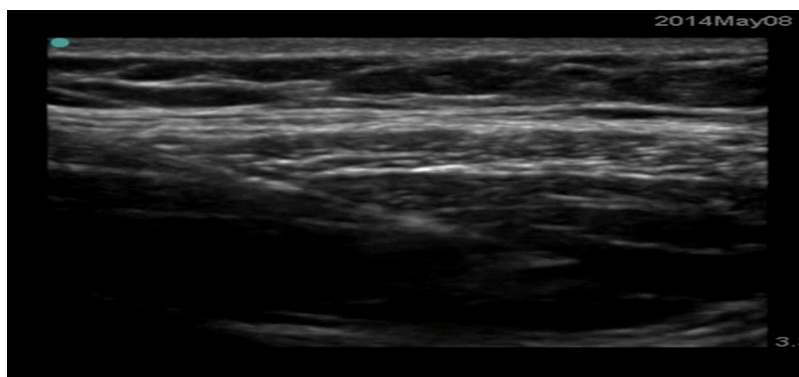


Fig. (1): USG-TAP block

Statistical analysis

Statistical analysis was done using the IBM SPSS 23 software. Demographic data were analyzed using Student's *t*-test or Fisher's exact test as appropriate. The comparison of additional analgesic need and VAS pain score between the two groups were done by paired *t*-test. Frequencies of PO side effects were pre-

sented as numbers and percentages, and their significance was analyzed using Fisher's exact test.

RESULTS

There was no significant difference in demographic data (Table 1), VAS pain score (Table 2) and additional analgesic need (Table 3) between both groups.

Table (1): Demographic data

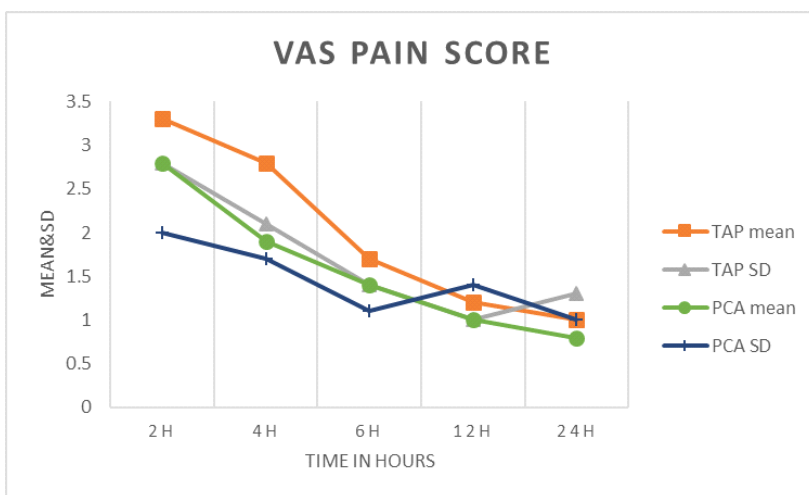
Variable	PCA	TAP	P value
Age	30±6.7	29±7.3	0.366
weight	72±18.5	76±17.2	0.263

Table (2): VAS pain score

	2h	4h	6h	12h	24h
TAP	3.3±2.8	2.8±2.1	1.7±1.4	1.2±1.0	1±1.3
PCA	2.8±2	1.9±1.7	1.4±1.1	1±1.4	0.8±1

Table 3: Additional analgesic need

	2h	4h	6h	12h	24h
TAP	0/49	0/49	0/49	0/49	1/49
PCA	0/48	1/48	0/48	0/48	0/48



In IV PCA morphine group, more cases developed postoperative nausea and vomiting, nevertheless there was no statistically significant difference between both groups; nausea (7.2% vs 1.5%; $p = 0.45$) and vomiting (5.7% vs. 0%; $p = 0.06$) respectively). However, the postoperative sedation was significantly noticed in IV PCA morphine group.

DISCUSSION

Poor post-CD pain management may produce many acute adverse physiologic responses including respiratory complications, venous thromboembolism, and prolonged hospital stay. Moreover, mothers would not be able to take care of their babies and thus missing early breastfeeding opportunities. Sousa et al. (2009) studied the relation between the post-CD pain and the daily activity limitations and reported limitation of daily activity of 100% of the study participants related to sitting down and standing up, 95% regarding walking, and 55% concerning personal hygiene.

Many drugs have been used for post-CD pain management, but opioids are the first and the most common of them despite of its associated complications especially respiratory complications, depression, sedation, pruritis, nausea and vomiting (Ismail et al., 2012). Non-steroid anti-inflammatory drugs are also used, but most surgeons do not prefer them because of increasing bleeding tendency and gastrointestinal bleeding (Surakarn & Tannirandom 2009). Epidural analgesia is considered the good alternative for postoperative pain relief, but the increased risk of dural and vascular puncture limits its use especially for emergency situations (Laviola et al., 2009).

Postoperative pain management represents a major challenge in Egyptian rural and suburban areas secondary to inadequate health care systems, limited resources and lack of trained personnel for monitoring the pain and delivering the management. TAP block is a well-thought-out and optimal solution to overcome these problems as it is simple, single shot and does not require continuous monitoring.

Depending on anatomical landmark, TAP block success rate is around 85% (Jankovic, 2009), but it is still a blind technique. On contrast, US give a real-time picture that allows TAP block with fewer complications (Sharma et al., 2013).

VAS values were lower in patients undergoing TAP block after abdominal surgery than with tramadol PCA (Sharma et al., 2013). Similarly, Srivastava et al., (2015) detected significantly lower pain score and significantly longer time for the first request of analgesia with TAP block for cesarean section.

In this study, USG-TAP block guarded against the complications of blind techniques and showed no significant difference in VAS pain score and additional analgesic needs on comparison to IV-PCA morphine.

Numerous reasons can influence nausea and vomiting during and after spinal anesthesia for caesarean section. Still, opioids are considered to be the most common cause. In this study, in IV PCA morphine group, more cases developed postoperative nausea and vomiting. Nevertheless, there was no statistically significant difference.

Sedation, one of the major complications of opioids use, delayed the early ambulation and breastfeeding. In this study, the postoperative sedation was significantly noticed in IV PCA morphine group.

Limitation of the study

This study was not blinded as TAP block, and PCA were two different techniques. Secondly, in rural areas, social background and cultural beliefs suggest that pain is an inevitable and normal consequence of delivery, and mothers should not complain about feeling pain. Moreover, based on their religious thoughts, they believe that every pain humans experience will wash away their sins and strengthen their faith.

CONCLUSION

In rural areas, for post-CD pain management, the USG-TAP block is an effective method as IV-PCA morphine and is relatively a safe procedure.

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منع التوصيل في مستوى العضلة البطنية المستعرضة باستخدام
الموجات فوق الصوتية الموجهة كطريقة فعالة للتعامل مع آلام
ما بعد الجراحة القيصرية في المناطق الريفية
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الخلفية: الألم الناتج بعد الولادة القيصرية قد يؤخر فترة النقاهة المبكرة ويزيد من حدوث مضاعفات الألم مع إطالة مدة الإقامة في المستشفى.

الأهداف: مقارنة كفاءة منع التوصيل في مستوى العضلة البطنية المستعرضة باستخدام الموجات فوق الصوتية الموجهة إلى كفاءة تسكين الألم عن طريق الوريد وذلك لعلاج آلام الولادة بعد عملية الولادة القيصرية في المناطق الريفية.

الطريقة: تم تقسيم مائة امرأة إلى مجموعة منع التوصيل في مستوى العضلة البطنية المستعرضة باستخدام الموجات فوق الصوتية الموجهة ومجموعة التسكين عن طريق الوريد باستخدام المورفين، تم منع التوصيل في مستوى العضلة البطنية المستعرضة باستخدام ٠.٢٥% من البوبيفاكاين ١٥ مل على كل جانب، وفي مجموعة التسكين عن طريق الوريد باستخدام الحقن الوريدي للمورفين بجرعة ١.٥ ملجرام وبفاصل تأميني ١٠ دقائق وشملت النتائج مقياس التماثلية البصرية الآلام تم تحديدها كل ساعتين، إجمالي استهلاك المواد التي تحتوى على الأفيون خلال الأربعة والعشرون ساعة التالية للعملية الجراحية وإحتمالية الغثيان والقيء.

النتيجة: لم يكن هناك اختلاف كبير في درجة الألم على نطاق التماثلية البصرية والحاجة الى مسكنات إضافية بين المجموعتين . في مجموعة التسكين عن طريق الوريد باستخدام المورفين ظهرت المزيد من حالات الغثيان والقيء بعد العملية الجراحية . ولم يكن هناك اختلاف كبير بين المجموعتين فيما يتعلق بإحتمالية الغثيان

والقى لكن لوحظ وجود خمول نتيجة التخدير بعد العملية الجراحية بشكل واضح فى مجموعة التسكين عن طريق الوريد بإستخدام المورفين

الاستنتاج: فى المناطق الريفية لعلاج الالم بعد العملية القيصرية منع التوصيل فى مستوى العضلة البطنية المستعرضة باستخدام الموجات فوق الصوتية الموجهة هي طريقة فعالة مثل التسكين عن طريق الوريد بإستخدام المورفين و الاجراء الأكثر أمناً.

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