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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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THE TRANSVERSUS ABDOMINIS PLANE BLOCK AS A METHOD OF MULTIMODAL OPIOID-SPARING POSTOPERATIVE ANALGESIA: A NARRATIVE REVIEW

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Abstract.

Purpose of Review: This review summarizes the updated literature on the use of the transversus abdominis plane (TAP) block as a method of multimodal opioid-sparing analgesia.

Recent Findings: Opioid drugs are frequently used to manage postoperative pain. Excessive opioid prescribing may play a role in the current opioid crisis. Therefore, novel opioid-sparing and multimodal approaches to postoperative analgesia are currently desired. The transversus abdominis plane (TAP) block is a form of loco-regional anesthesia of the anterolateral abdominal wall. Growing evidence supports the effectiveness of TAP block for postoperative analgesia following various types of abdominal surgeries. This review discusses the TAP block in the context of opioid-sparing postoperative analgesia in comparison to other methods.

Summary: The TAP block is a safe and reliable technique for postoperative somatic analgesia, with efficacy comparable to other modalities such as epidural, spinal, and regional blocks. However, it does not adequately control visceral pain and is therefore most effective when incorporated into a multimodal analgesic regimen.

Key words. TAP, analgesia, anesthesia, multimodal, ERAS.

Introduction.

Pain is one of the most distressing symptoms of the postoperative period, and the ideal strategy for pain management remains unclear. A United States national survey published in 2014 by Gan et al. [1] reported that 75% of patients experienced moderate to severe postoperative pain. Poorly controlled acute postoperative pain is considered one of the main factors leading to the transition to chronic postoperative pain, which is defined by the International Association for the Study of Pain (IASP) as "pain beyond normal tissue healing, which is assumed to be 3 months".

Opioids have been used for centuries to treat acute pain. However, the modern tendency is to restrict the use of opioid drugs, mainly because of the opioid crisis/epidemic currently affecting the world. Nevertheless, opioids remain an important tool in the management of acute pain and as primary or adjunct anesthetic agents.

Although opioids have proven to be effective, inexpensive analgesics, their effectiveness is more pronounced for pain at rest than for pain associated with physical activity. Therefore, their role in functional recovery in patients with persistent postoperative pain is questionable [2]. In addition, various side effects of opioid administration (sedation, nausea and vomiting, respiratory depression, intestinal obstruction, urinary retention, potential dependence) negatively affect patient satisfaction. Moreover, opioids are not always effective for postoperative pain relief, as their use at high doses can rapidly induce opioid-induced hyperalgesia or tolerance [3].

Extensive opioid use in medical practice may play some role in the spread of the opioid epidemic. Thus, the use of opioids during and after surgery to treat acute pain can increase the risk of long-term opioid use by up to 44% [4]. Moreover, the literature reports the prevalence of chronic use of opioid analgesics in patients undergoing surgery, even in the absence of pain [5]. Therefore, the current tendency in anesthesiology is to move from extensive opioid use toward novel anesthesia paradigms that can provide efficient and safe analgesia.

ERAS protocols.

Various multimodal approaches to pain management have been associated with reduced rates of postoperative pain and opioid consumption. In 1994, Engelman and colleagues published the results of a method of fast recovery after coronary bypass surgery with modified anesthesia protocols [6]. The study confirmed the safety and efficacy of the method of fast recovery among all patients, including the high-risk group. Based on these results, in 2001, a group of European surgeons developed the concept of interdisciplinary, multitasking, patient-centered, and evidence-based perioperative protocols. These protocols, also

known as ERAS (Enhanced Recovery After Surgery), expanded the range of interventions from postoperative care to the entire perioperative period. Under ERAS protocols, the personnel may consider existing therapeutic alternatives for managing acute and long-term pain, including minimizing perioperative opioid use, and establishing adequate opioid prescribing practices.

ERAS protocols [7] aim to reduce the physiological response to surgical intervention. Twenty-four main elements are distributed along the patient pathway, administered by different departments and specialists working in synergy between one element and the next [8]. Protocols are regularly reviewed, and effective changes are made as new data become available to reduce life expectancy, complications, and readmissions. However, these short-term results do not accurately reflect patient satisfaction and functional recovery after surgery [9]. Lee et al. [10] viewed postoperative recovery as a complex multi-dimensional process that encompasses a wide range of physical, psychological, economic, and social aspects with varying outcomes.

Over the past decade, numerous studies have discussed the implementation of ERAS protocols and opioid-sparing treatment strategies in the perioperative setting and the quality of recovery in surgical patients. Although the potential impact of implementing ERAS programs on long-term opioid use requires further investigation, there is ample evidence supporting a link between ERAS protocol usage and a significant reduction in opioid consumption, which could potentially have a positive impact on long-term opioid use, dependence, addiction, diversion, and abuse [11-17].

Multimodal strategies for opioid analgesia in the postoperative period.

Multimodal anesthesia and pain management based on opioid-free or opioid-sparing regimens (including regional anesthesia techniques) have demonstrated the ability to limit perioperative opioid consumption in several surgical specialties with reduced opioid exposure, opioid availability, and the risk of long-term use or abuse [3].

ERAS pathways for pain management consist of several preoperative, intraoperative, and postoperative interventions interacting to provide adequate levels of pain relief and patient comfort while reducing or eliminating opioid consumption [18-20]. An effective strategy for multimodal opioid-free analgesia depends on the synergistic effect of the simultaneous use of several pharmacological agents methods acting on different pathways of the nociceptive mechanism (transduction, transmission, modulation and perception), such as non-steroidal anti-inflammatory drugs (NSAIDs), acetaminophen, gabapentinoids, alpha-2 agonists (dexmedetomidine, clonidine), N-methyl-D-aspartic acid antagonists (ketamine, Mg2+), glucocorticoids, as well as the methods of locoregional anesthesia and alternative therapies [3,17,19-27].

For major abdominal surgeries, traditional approaches such as epidural analgesia or opioid-based intravenous patient-controlled analgesia (IVPCA) usually result in appropriate control of pain. However, the above approaches do not result in improved recovery or reduction in morbidity when compared with alternative pain management strategies used as part of ERAS protocols [14,28].

Currently, there is a growing tendency toward the use of peripheral regional anesthesia techniques. This has occurred concomitantly with the increase in less invasive surgical procedures (also approved by ERAS protocols). The combination of peripheral regional anesthesia techniques and minimally invasive surgical procedures provides the benefits of greater hemodynamic stability and fewer movement disorders. Thus, recently developed guidelines for postoperative pain management advocate the use of site-specific regional anesthetic techniques as part of a multimodal analgesia protocol [6,22].

Transversus abdominis plane block as an alternative method of opioid-sparing postoperative analgesia.

The popularity of regional analgesia methods is due to the advent of ultrasound guidance, which is currently considered the gold standard for peripheral nerve blocks. The transversus abdominis plane (TAP) block was introduced by Rafi about 20 years ago and has achieved wide clinical use since then [29], mainly because of its relative technical simplicity and low rate of occurrence of significant side effects, especially when performed under ultrasound guidance [30]. The TAP block is a form of loco-regional anesthesia in which the local anesthetic is introduced into a space between the internal oblique and transversus abdominis muscles to "bathe" thoracolumbar nerves originating from the T6 to L1 roots that are passing in this space. The resulting "neural field" block affects the innervation of the abdominal skin, muscles, and parietal peritoneum and effectively covers pain after abdominal surgery [31].

TAP blocks can be performed via three main approaches—subcostal, lateral, and posterior—each targeting a specific fascial plane [32]. In the subcostal approach, local anesthetic is administered between the transversus abdominis and posterior rectus sheath (T6–T9) to provide analgesia for cholecystectomy. The lateral approach involves injection between the internal oblique and transversus abdominis at the midaxillary line (T10–T12), suitable for appendectomy, hernia repair, laparotomy, cesarean delivery, and bariatric surgery. The posterior approach targets the posterior TAP plane near the lumbar triangle or quadratus lumborum (T9–T12), providing analgesia for renal and retroperitoneal procedures. Collectively, these approaches allow targeted abdominal wall analgesia tailored to surgical site and dermatomal coverage.

TAP blocks provide effective somatic analgesia but are generally short-lived, highlighting their role as part of multimodal pain management. Alsharari et al. reported the use of local anesthetics such as bupivacaine, ropivacaine, levobupivacaine, and lidocaine, often combined with adjuvants like dexmedetomidine, dexamethasone, magnesium sulfate, ketorolac, or opioids, to enhance analgesic quality and duration [33]. Clinical efficacy varies depending on the approach, timing, anesthetic choice, and use of adjuvants; while TAP blocks consistently reduce opioid consumption and improve postoperative pain control, optimal technique, dosing, and comparative effectiveness of different TAP strategies remain to be established.

It has been determined that the TAP block effectively covers only the somatic component of pain while failing to manage

visceral pain [34,35], although some studies reported a consistent benefit in the first 24–48 hours after surgery in terms of pain scores and overall opioid consumption [36,37]. It has been suggested that although primarily targeting somatic pain, TAP block may also have indirect effects on visceral pain through the blockade of overlapping thoracolumbar afferent pathways and modulation of central sensitization [38].

Nevertheless, for effective visceral pain management, the TAP block must be supplemented by other methods of analgesia, such as systemic administration of acetaminophen [39], NSAID [39-41], ketoprofen [42] or other methods of regional anesthesia, such as quadratus lumborum (QL) block [43], bilateral dual TAP block [44,45] and continuous TAP block via TAP catheter [46-48]. Therefore, the TAP block is increasingly included in multimodal analgesia regimens, and there is strong evidence of its effectiveness in ERAS protocols.

In addition, when compared to the placebo, the TAP blockade after abdominal surgery may decrease the postoperative use of opioids and postoperative nausea and vomiting (PONV) [44]. However, the effect of TAB block on postoperative nausea and vomiting is not entirely clear, as some studies report no apparent effect of TAB block on these symptoms, or even an increase in the incidence of nausea and vomiting with TAB block, compared to placebo [49]. According to Zhao et al. [49], the difference in the incidence of PONV between studies could be attributed to variations in study protocols, types of surgery, and scales of assessment. Therefore, further systematic analysis is needed to clarify the factors underlying the variable effects of TAP block on postoperative nausea and vomiting.

Epidural anesthesia in comparison and in combination with the TAP block.

Traditionally, postoperative analgesia after abdominal surgery has been based on epidural anesthesia. Epidural anesthesia with local anesthetics (bupivacaine, ropivacaine) is probably the basis of neuraxial analgesia in ERAS protocols, providing effective postoperative analgesia in open abdominal surgery [28,50]. Similarly, continuous high-thoracic epidural and paravertebral blocks are an integral part of ERAS protocols for thoracic surgery (open thoracotomy, video-assisted thoracotomy), improving postoperative pain management [51,52]. The combination of thoracic and paravertebral blocks with systemic multimodal anesthesia has proven effective in providing adequate postoperative analgesia and has also been included in recent ERAS guidelines for mastectomy and breast reconstruction [53,54].

However, recently, the TAP blockade has been increasingly used as an alternative method of postoperative analgesia. In a study by Desai et al [55], the epidural analgesia was compared with the TAP block. The study demonstrated that the TAP block reduced the need for intravenous morphine-equivalent consumption over 0–24 hours at the expense of increased incidence of hypotension at 72 hours [55]. Moreover, the combination of epidural anesthesia with a TAP block has been successfully used for postoperative pain relief in patients undergoing rectal stump surgery [56,57] and hepatectomy [58]. In another study, a multimodal TAP block with ketoprofen has been shown to provide adequate analgesia in the postoperative period, comparable to that of epidural anesthesia [42]. Moreover, the proposed method of multimodal TAP block had an advantage over epidural anesthesia in terms of side effects and the absence of hypotension in the postoperative period [42].

Epidural anesthesia remains a gold standard technique in postoperative analgesia [59]. However, some studies report a higher incidence of hypotension after epidural anesthesia in comparison to the TAP block [60-62]. In addition, epidural anesthesia is contraindicated in sepsis, hemodynamic instability, coagulopathy, and anticoagulant medications [63,64]. From the above perspective, the TAP blockade could have an advantage over epidural anesthesia.

Comparison of the TAP block and spinal anesthesia.

The TAP block, guided either by traditional anatomical landmarks or by ultrasound navigation, is a simple and safe technique with a potential alternative to spinal opioids for pain relief after the cesarean section, hysterectomy, open prostatectomy, laparoscopic cholecystectomy, and appendectomy [65-72].

Few studies are comparing TAP block with spinal opioids or epidural analgesia [73]. The advantage of TAP blockade over spinal opioids is improved pain relief, reduced opioid-related side effects, and no motor blockade. In addition, the TAP block may provide similar analgesia at rest and even better analgesia on movement compared to systemic opioids and may be synergistic with neuraxial opioids. Thus, the meta-analysis of Abdallah et al. [74] revealed that the TAP block provides better analgesia compared with placebo and can reduce morphine consumption in the first 24 hours under a multimodal analgesic regimen that excludes spinal morphine. Therefore, the TAP block may provide effective analgesia when spinal morphine is contraindicated or not used. In addition, the TAP block also reduced pain scores on the visual analogue scale and the incidence of opioid-related side effects [74].

Comparison of the TAP block and the rectus sheath block.

The rectus sheath (RS) block provides somatic analgesia at the abdominal midline; therefore, it could be used during and following the midline laparotomy. The RS block is commonly used in pediatric and adult umbilical hernia repair [75,76], adult single-incision cholecystectomy [77], and some gynecological procedures [78,79]. Ultrasonic guidance allows greater reliability in administering local anesthetics and decreases the risk of complications. Besides the analgesic efficacy and reduction of opioid use in RS block, some of the studies also found significant reductions in postoperative nausea/vomiting, sedation, and constipation, as well as improvements in patient satisfaction [80,81].

A recent RCT compared the analgesic effects of transversus abdominis plane and rectus sheath block in parturients undergoing elective caesarean delivery [82]. The patient-reported pain scores, as well as the morphine consumption, were lower in the TAP group than in the group of RS block. The authors concluded that the TAP block provides effective postoperative analgesia, while the efficacy of the RS block was sub-optimal in parturients after the caesarean delivery [82]. Another study suggested that both TAP and RS blocks were effective and safe for pain relief after caesarean delivery;

however, the TAP block was superior to RS block [83].

The RS block could be combined with the TAP block to achieve better analgesia. Thus, in an RCT by Abdelsalam and Mohamdin [84], a combination of bilateral ultrasound-guided RS and TAP blocks provided excellent perioperative analgesia for major upper abdominal surgery compared to local wound infiltration with bupivacaine. In a study by Toscano et al, a combination of RS block and TAP block was reported to be effective in managing postoperative pain in patients who underwent preaponeurotic endoscopic repair [85]. In addition, the patients who received the dual RS + TAP block required fewer analgesic rescue doses and demonstrated earlier recovery [85].

Comparison of the TAP block and erector spinae plane block.

Erector spinae plane (ESP) block is a relatively novel method of loco-regional anesthesia used following a variety of surgical procedures in the anterior, posterior, and lateral thoracic and abdominal areas. It could be performed as a single-injection block or continuous anesthetic administration through a catheter. ESP block is usually performed as an in-plane ultrasound-guided technique. The needle is inserted between the erector spinae muscle and the thoracic transverse processes. The anesthetic spreads along the dorsal and ventral rami of the thoracic and abdominal spinal nerves, resulting in a sensory block of the anterior, posterior, and lateral thoracic and abdominal walls.

A recent meta-analysis studying 8 independent RCTs comparing ESP block and oblique subcostal TAP block following laparoscopic cholecystectomy, revealed that the analgesic efficacies of ESP and TAP blocks were similar [86]. In addition, there was no significant difference in 24-hour opioid consumption between the ESP and TAP groups [86].

Comparison of the TAP block and wound infiltration with local anesthetic.

A study by Gurnaney et al. [87] revealed a trend towards lower postoperative opioid consumption for patients with ultrasound-guided TAP block compared with local anesthetic wound infiltration. This advantage is balanced by the time required to complete this block and the training required to use ultrasound to perform the transverse abdominal block [87]. Further studies are needed to assess the duration of this analgesic effect beyond the immediate postoperative period [87]. Somewhat contradictory evidence on opioid-sparing benefits of the TAP block was provided by Wright et al [88]. In that study, no significant difference in postoperative morphine consumption was found between TAP and wound infiltration groups [88].

Three different reviews summarized data comparing TAP blockade with local anesthetic wound infiltration [89-91]. Taken together, the evidence from these reviews indicates that TAP block provides superior and longer-lasting analgesia compared to local anesthetic wound infiltration.

Limitations of the paper.

This review is a narrative synthesis and does not employ a systematic methodology such as the PRISMA framework for literature search and study selection. Consequently, there is a potential risk of selection bias, and some relevant publications may not have been captured. This limitation is inherent to narrative reviews and should be taken into account when interpreting the findings. At the same time, we believe that the narrative format makes the review more accessible and clinically relevant for practicing physicians, facilitating its use in everyday decision-making.

Summary.

Over the past two decades, the TAP block has established itself as a valuable method for managing somatic pain following abdominal surgery. Its safety and reliability have increased with the use of ultrasound guidance, and its analgesic efficacy for somatic pain is comparable to that of other postoperative modalities. However, the TAP block alone is insufficient for controlling visceral pain, and its optimal use is within a multimodal analgesic regimen, combined with other postoperative analgesic methods to provide more complete pain management.

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