



Retrospective Study on the Cost-Effectiveness of Tap Block Compared to Traditional Analgesic Methods in Abdominal Surgeries

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Abstract

This study has discussed both the traditional analgesic method for abdominal surgeries and also TAP Block method for abdominal surgeries. The comparison regarding the cost-effectiveness can be explored with the help of this research. The secondary qualitative data has been gathered from different secondary sources to get an accurate result for this research that can help in understanding which method is more cost-effective in abdominal surgeries. It can be seen by analysing the gathered data with the help of the thematic data analysis method that the initial implementation of TAP block techniques is much more expensive than the traditional analgesic method. However, it can also be seen that this TAP Block method can help in reducing the healthcare expenses of the patients in the long run. It can also help in enhancing patient satisfaction towards healthcare facilities. The incorporation of TAP Block methods can help in enhancing patient care throughout the globe.

1. Introduction

1.1 Background of Study

The technique Transversus Abdominis Plane (TAP) Block denotes the usage of the technique to inject

anaesthesia into the abdominal muscles. This technique is used to block the pain stimulus. There are various complications which are associated with the TAP block which include “bowel hematoma, enlarged liver laceration, and transient femoral nerve palsy” [1]. The other organs that are punctured during TAP block are the spleen (particularly) and the kidney.

The TAP Block technique is performed by applying a local anesthetic between the transversus abdominis muscle and the superficial layer surrounding it. This technique offers a variety of advantages such as following a valuable

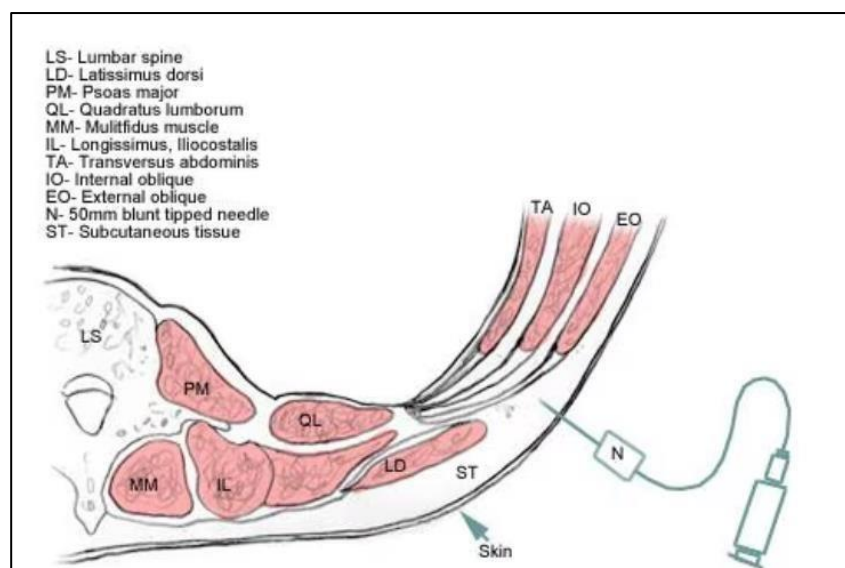


Figure 1.1: Cross Section of the Abdominal Wall Layers



approach to managing pain, effective reduction in pain, resilience on opioids, and improved recovery.

1.2 Problem Statement

The cost-effectiveness of the TAP block in comparison to traditional analgesic methods within abdominal surgeries offers cost savings in the cases of laparoscopic cholecystomy the post-operative pain can be controlled by using a variety of TAP methods. The problem behind the TAP methods usage is that these need a bilateral block for the midline incision and the absence of effectiveness for the visceral pain. Traditional analgesic techniques such as “acupuncture, application of TENS modality, and biofeedback” for pain management are comparatively low.

1.3 Research Aim and Objectives

Aim

The main research aim is to identify the costeffectiveness of the TAP block in comparison to traditional analgesic methods in abdominal surgeries.

The Objectives of the study are as follows:

- To analyze the role of TAP block in relieving pain
- Evaluating the cost-effectiveness of the TAP block
- To analyze the variety of traditional analgesic methods in pain relieving.
- To assess the cost-effectiveness of traditional

1.4 Significance of the Study

The significance of the study is due to providing basic knowledge and understanding of the total cost consumed by the TAP block method and the cost consumed by the traditional analgesic methods. Identification of various factors that are responsible for the cost-effectiveness of the TAP block and traditional analgesic methods. Identifying the various methods to prevent costeffectiveness and understanding the effectiveness of both methods in abdominal surgeries. The study is significant for providing knowledge on the adoption of which two methods will be preferred.

2. Literature Review

2.1 Overview of TAP Block Methods in Abdominal Surgeries

These methods are considered for pain relief these methods are cost-effective in various abdominal surgeries however in some of the surgeries it may not be possible. These techniques are commonly given by the “classical approach or the posterior approach which can provide the analgesic effect from the dermatome T7 to T12”. there are various techniques to offer TAP block such as the subcostal TAP block technique which causes the blockage of pain receptors from T6 dermatome onwards.

Proposed TAP zones that are upper subcostal (USC),

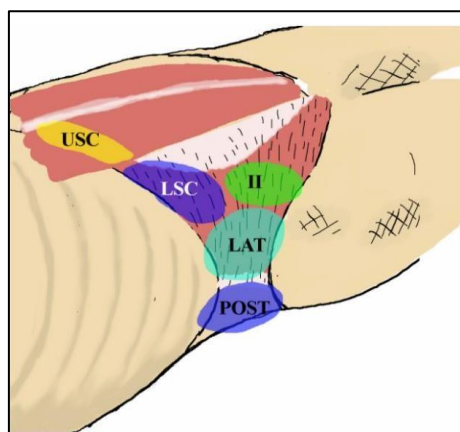


Figure 2.1: Proposed TAP Zones

analgesic methods

- To compare the cost-effectiveness of TAP block and traditional analgesic methods in abdominal surgeries.

lower subcostal (LSC), lateral (LAT), Posterior (POST) and inguinal (II) can be seen from the above diagram. Each of these TAP zones targets different nerves for



providing pain relief in case of abdominal surgeries. The laparoscopic surgeries that are assisted by using TAP Block methods are considered as faster and more efficacious which plays an important role in setups where the ultrasound machines are not available as it guides the anesthesia team [4].

In the conventional epidural method, the above diagram demonstrates that the Tuohy needle is within the epidural

2.2 Overview of Traditional Analgesic Methods in Abdominal Surgeries

There are a variety of traditional pain relief methods such as TENS (transcutaneous electrical nerve stimulation), “opioids, neuraxial techniques, epidural analgesia, and local infiltration analgesia”. These methods are the traditional methods for the prevention of pain in abdominal surgeries these are mainly in the form of peri or intra-articular injections. Pain involves four physiological phenomena that are transduction, transmission, perception, and modulation. According to this the traditional methods of analgesics were used. The neural axial technique is effective in patients in which there is “opioid-sparing effect is a cause”. This also leads to a “reduction in the sympathetic stress response”. Opioids are considered the “main method of providing the analgesic effect in the patient due to their different properties”. " However, opioids are associated with several side effects such as “nausea, vomiting, and respiratory distress” [5].

provides a comparatively better result than standard intravenous opioid analgesia” [7]. Insufficient

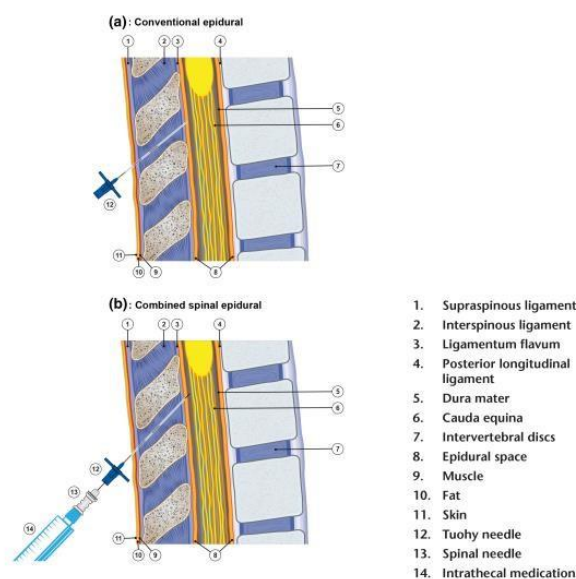


Figure 2.2: Conventional Epidural Method (a) and Combined Spinal Epidural Method (b)

space before threading the epidural catheter through the hollow Tuohy needle to lie within the epidural space.

Patient pain control management plays “an important role in the postoperative management of the pain which

management of perioperative pain management leads to a variety of symptoms such as “ileus and delayed ambulation” which ultimately leads to an increase in the cost of hospitalization.



2.3 Literature Gap

The identification of factors responsible for the costeffectiveness of TAP block methods and traditional analgesic methods in abdominal surgeries is relatively biological or cognitive. The limitation of costeffectiveness in TAP block methods as compared to traditional analgesic methods is a comparison of the gold-standard analgesic techniques for each surgical procedure that is difficult to perform [8]. The TAP analgesic techniques are simplified and effective techniques that can be trusted by patients and doctors. Considering the cases of laparoscopic surgeries the induction of both perinatal and visceral pain and other techniques are more appropriate than local anesthesia instillation which is combined with infiltration. "Regional anesthesia in today's times is increasingly gaining popularity due to its commonly known feature of opioid-sparing analgesic effect however due to the lack of consensus on the indication and low efficacy these are insufficient to fulfil the goals in plastic surgeries".

3. Methodology

3.1 Research Design

The research design is defined as the strategy or a framework that is developed to conduct the research through the research design and the analysis of the research becomes simplified. and *Exploratory Research Design* has been incorporated within this research as it has several advantages. The advantages of this research design are that enables the researcher to understand the variety of limitations of the topic and helps in providing recommendations for the same limitations. This also helps in exploring various aspects of the study, helps in generating the hypothesis for the study, ideas, and different perspectives on the issues of the subject. The research design is essential to understand the framework of the study and the various aspects and perspectives of the researcher.

3.2 Data Collection Method

The data collection method is defined as the method of collecting the data from various available sources and gathering a piece of subject-related information. This research has included the *Secondary Qualitative Data Collection Method*. This data collection method has several advantages which are it provides time-efficient data collection, the sources gathered from this method are easy to obtain and the information obtained is accurate and has

an effective perspective. The information gathered from this method influences and reshapes the research. This method provides high-quality data gathered from government reports. This method allows subgroup and subset analysis of the data. This research has not included primary data as it consumes time and is not an updated form of data. This data collection method is high-cost. These have a limited scope for the study. This data lacks generalizability and precision findings.

3.3 Data Analysis Method

The data analysis method is defined as a systemic procedure of a systematic and logical process to summarise, illustrate, and analyze the data [9]. This research has incorporated *Thematic Data Analysis Method* to get an accurate outcome from the research. This method of data analysis has several advantages which are it assesses the effectiveness of the study. This method helps in analyzing complex data, and also it allows a deep analysis of the informative data to study. This method also helps in analyzing the different perspectives of the study [10]. This research has not included statistical data analysis as statistical data analysis is well suited to the qualitative data and it can be a reason for gaining inappropriate results by applying this method within this research.

3.4 Research Limitations

Primary data can be gathered in real time unlike secondary data as secondary data is already available in different secondary sources. This research has included secondary qualitative data however, the incorporation of primary data can help in getting more reliable and accurate outcomes from this research. Furthermore, this research has incorporated a thematic data analysis method however, the incorporation of statistical data analysis can help in gaining a broad understanding of the trends and patterns of the data.

4. Data Analysis

4.1 Comparison of Pain Management Efficiency and Patient Satisfaction between TAP Block and Traditional Analgesic Methods

The efficiency of TAP block in pain management in terms of patient satisfaction is that it significantly results in reducing the pain after the surgery while in comparison to ilioinguinal block, it does not reflect any significant difference. The TAP block and ilioinguinal blocks in



recent times are gaining consideration as these are capable of providing effective pain management in patients. Both of these blocks “target the ilioinguinal and iliohypogastric nerves. These both are the form of “multimodal analgesia for the post-operative pain” Their efficacy is “still uncertain” [11]. The optimal time to perform the TAP block is before or at the end of the surgery being performed this leads to an increase in the efficiency of the blocking mechanism thus relieving the pain efficiently. The USG TAP block during pain relief decreases the NRS score of the pain scale both during rest and coughing. There is no significant difference in the number of analgesics administered to the patient that performs dual TAP block and port site local anesthetic infiltration [12].

Whereas the traditional analgesic methods for pain management have come out as the better pain-controlling agents in a variety of patients who have undergone abdominal surgeries. The patient-controlled epidural analgesia is frequently used in pain relief during childbirth surgeries [13]. These are effective in relieving pain as compared to T block and also a better form of medication in comparison to intravenous medications [14]. The epidural analgesia method falls under the risk in various patients who suffer from heart and lung diseases as this traditional method of analgesic may also lead to heart attack and pneumonia which is a severe complication. Although opioids play an important role in pain management despite its increased hospital morbidity and related costs.

4.2 Comparative Evaluation of Overall Cost Effectiveness between TAP Block and Traditional Analgesic Methods

The comparative evaluation of the cost-effectiveness of TAP block with traditional analgesia in lower abdominal surgeries is comparatively low. The incorporation of the analgesics by the patient is due to the reason the patient can bear the pain and stress of the surgery not only this analgesic effect within the patient after the surgery is significant as it allows the patient to ambulate at the early stage after the surgery also it limits the complications such as post-operative lung atelectasis, hypoxemia, and deep vein thrombosis. The TAP block mainly works on the myocutaneous nerves of the anterior compartment of the abdomen. The use of a TAP block by the single needle punctures the lumbar triangle therefore reducing the pain. The TAP block is an effective method and

epidural anesthesia also reflects the same result in abdominal surgery.

The “Opioid consumption reduces the TAP block and pain scores after the abdominal surgeries showed no intervention and placebo”. The TAP block patients are considered to have high nausea and vomiting in the initial hours of the surgery [15]. The traditional analgesic methods are not that significantly cost-effective as some of these such as opioid analgesics run out of price. This also depends on the socio-economic factors of the individual patients. The cost-effectiveness of traditional analgesics over TAP block shows some advantages in the patients to manage pain [16]. There is an equal and “valuable contribution of the effective communication in the pain assessment and patient education also counseling of the patient is important in treating the pain of the patient efficiently which is another form of traditional analgesic method.

5. Discussion

The Transversus Abdominal Plane (TPA) and the conventional therapeutic methods which include narcotics as well as epidermal anesthesia are mostly used for the pain after the surgery. TAP blocks provide concentrated relief from pain with no general side effects. According to the study, TAP blocks provide significant pain relief especially the first 24 hours after the operation, and reduce the need for pain killers thus, preventing any adverse side effects such as “nausea and respiratory depression”. On the other hand, the conventional methods of consumption of opioids are at a very high level which results in various types of adverse reactions that affect the health of the patients [17]. Patient satisfaction is quite better with TAP blocks as they provide good relief from the pain and have fewer side effects thus allowing faster mobility as well as quicker recovery from the surgery. Moreover, the conventional methods even if it is successful satisfaction level is quite low due to the after-effects of the surgery and post-operative care.

Cost-effectiveness is a crucial part that needs to be taken care of while selecting treatments for the pain. TAP blocks, despite their high expense due to the requirement of ultrasound instructions as well as trained employees, are most effective in the long run. They need less surgical monitoring which reduces the time required to stay in the hospital thus not only reducing the hospital bills but also its hospital stay. Conventional methods such as drug



administration and epidermal injections may offer a reduction in the initial expenses, but they may result in higher long-term expenses due to side effects of the drugs, issues, and longer stays in the hospital. Prolonged health care expenses have rapidly increased with time which is followed by an increased level of opioid dependence by the patients.

6. Conclusion and Recommendations

6.1 Conclusion

TAP blocks exceed opioids and epidermal injections in terms of pain management as well as patient satisfaction. Along with initial expenditures, TAP blocks are most cost-effective due to reduced post-operative tracking, shorter hospital stays, and reduced long-term healthcare expenses. The reduction in opioid dosage and its false impacts enhances patient recovery as well as satisfaction. Although conventional methods are less expensive at first in the long run they cause more issues and high expenditure. TAP blocks provide long-term care for the patient and pain management after the surgery.

6.2 Recommendations

Implementing greater, multicenter research to further enhance the cost-effectiveness and benefits from the clinical trials of TAP blocks is highly recommended by the researchers [18]. Furthermore, by including TAP blocks in regular post-operative pain management processes and demonstrating to anesthesiologists' different methods that may improve patient satisfaction and elevate healthcare resources that can provide benefits to patients after surgery.

6.3 Future Scope

Studies related to TAP Blocks should mainly focus on its technological implementations and application in surgical operations. Moreover, research on TAP blocks from vigorous pain management, approval all over the globe and the development of policies will help to reduce pain management methods and increase patient care.

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