Anaesthetic considerations of Continuous Peripheral Nerve Block

Essay

Submitted for Partial Fulfillment of Master Degree.
in Anesthesia

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2011

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التخدير الموضعى المستمر للأعصاب الطرفية

رسالة مقدمة من

الطبيب/صلاح الدين محمود الحفنى طه
بكالوريوس الطب و الجراحة

توطئة للحصول على درجة الماجستير

تحت اشراف

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Introduction:

The art and science of regional anesthesia progressed significantly during the last century, resulting in improved safety and increased success rates. The frequency of serious complications related to neural blockade continues to decrease and is similar, if not superior, to that of general anesthesia. ***(Lennon RL & Horlocker TT, 2006)***

Patients undergoing continuous nerve block are evaluated daily for the presence and effectiveness of peripheral nerve blockade throughout their hospital stay. Assessment occurs after the block is performed in the block area or operating room, on the patient's arrival in the postoperative anesthesia care unit, and on a daily basis. ***(Bergman BD et al, 2003)***

Continuous peripheral nerve blocks are an integral part of a multimodal approach to postoperative analgesia after major orthopedic surgery. Additional research is needed to complete our understanding of the ideal delivery devices and infusates. Further efforts to prolong analgesia may include improved drug design, such as controlled-release local anesthetics or innovative additives. Future research should be directed toward improving the ease of performance to increase success (and acceptance). These techniques clearly have a wider application for postoperative pain relief. We envision a future in which peripheral nerve blocks for the lower extremity are widely taught and applied by all anesthesiologists, not just enthusiasts of regional anesthesia. ***(Lennon RL & Horlocker TT, 2006)***

Most continuous catheter techniques that were developed after the initial attempts of Ansbro in 1946 were hampered by inaccurate catheter placement or catheter dislodgement. In order to provide reliable analgesia for surgery and prevent readmission due to failed catheter placement, it was necessary to develop a method to ensure real-time catheter

positioning (i.e., during placement). This can now be done at insertion with all continuous peripheral nerve blocks (rather than hours later when the initial block has worn off), by stimulating the nerves via both the needle through which the catheter is placed and via the catheter itself . This accuracy of catheter placement is combined with a method to secure the catheter that prevents dislodgement. ***(Brown DL, 1999)***

Aim of work:

The aim of work to gain the basic knowledge for Continuous Peripheral Nerve Block .This work describes anatomy of peripheral nerves, physiology of nerve conduction, pharmacology of local anesthetics, indications, equipment, procedures, precautions and complications of Continuous Peripheral Nerve Block

References:

- **Bergman BD, Hebl JR, Kent J, Horlocker TT**. Neurologic complications of 405 consecutive continuous axillary catheters. Anesth Analg.96:247-52, 2003.

-Brown DL. Atlas of Regional Anesthesia. 2nd ed. Philadelphia, PA: W.B. Saunders Company; 1999.

- **Lennon RL & Horlocker** TT In :Mayo Clinic Analgesic Pathway Peripheral Nerve Blockade for Major Orthopedic Surgery p127-128,2006.

المقدمة

لقد تقدم علم التخدير الموضعي بشكل ملحوظ في العقود الأخيرة من القرن الماضي مما أدى إلى زيادة معدل الأمان ونسب النجاح. حيث أن مضاعفات التخدير الموضعي تقل كثيرا أو تعلى أكثر تقدير تماثل التخدير الكلي.

يتم تقييم المرضى الذين يخضعون للتخدير الموضعي في أكثر من موضع بالمستشفى وذلك أثناء التخدير والجراحة وكذلك في غرفة الإفاقة أو عناية التخدير ثم أثناء إقامتهم بعد العملية في غرفهم المخصصة لهم

تعتبر السدة العصبية عنصر مكمل لأشكال متعددة التي تهتم بفقدان المريض الشعور بالألم ما بعد الجراحة . ولذا فنحن نحتاج إلى أبحاث إضافية حتى يكتمل فهمنا عن الأدوات والطرق المثالية لإطالة فقدان الشعور بالألم.وقد يتضمن ذلك تصميم أدوية مخدرة جديدة أو توصيل المخدر للأعصاب بطرق أدق وذلك لتحسين الأداء وبالتالي زيادة نسب النجاح والقبول من قبل الأطباء والمرضى على هذه الطرق الجديدة.

ولنتصور المستقبل الذي فيه السدة العصبية تعلم على نحو واسع من قبل كل أطباء التخدير وليس فقط المهتمون بالتخدير الموضعي

أكثر تقنيات القسطرة المستمرة التي طورت بعد المحاولات الأولية لانسبرو في عام 1946 أعيقت بسبب وضع القسطرة الخاطئ او خلع القسطرة.لذا كان من الضروري تطوير طريقة لضمان وضع القسطرة بطريقة صحيحة وبالتالي نتمكن من إدخال المخدر الموضعي بصورة مستمرة ودقيقة وفعالة

الهدف:

يهدف هذا العملِ لاكتِسَاْب المعرفةِ الأساسيةِ للعصبِ الخارجيِ المستمرِ ويصف هذا العملِ عِلْمَ تشريح الأعصابِ الخارجيةِ وعِلْم وظائف أعضاء توصيلِ العصبِ وعِلْم صيدلة المخدّر الموضعي وإشاراتِ وأجهزةِ وإجراءاتِ وإجراءات وقائية وتعقيداتِ كتلةِ العصبِ الخارجيةِ المستمرةِ.

Introduction

Introduction

Regional anesthesia means the interruption of impulse conduction in the nerves using specific, reversibly acting drugs (local anesthetics).

Peripheral nerve blockade can be an excellent alternative to general anesthesia for many surgical procedures and does not significantly disrupt autonomic function. Regional blockade provides optimal surgical conditions while providing prolonged postoperative analgesia. Patient safety, satisfaction, and quicker initial recovery are among the benefits of regional anesthesia.

The use of nerve blocks is also associated with reduced use of opioids for postoperative pain, fewer postoperative complications, and earlier discharges. Regional anesthesia is particularly desirable and effective in elderly and high-risk patients undergoing a wide variety of surgical procedures, particularly on the upper and lower extremity.

Imaging guidance for nerve localization holds the promise of improving block success and decreasing complications. Among imaging modalities available, ultrasonography seems to be the one most suitable for regional anesthesia. Perhaps the most significant advantage of

ultrasound technology is the ability to provide anatomic examination of the area of interest in real-time. Ultrasound imaging allows one to visualize neural structures (plexus and peripheral nerves) and the surrounding structures (e.g., blood vessels and pleura), navigate the needle toward the target nerves, and visualize the pattern of local anesthetic spread.

Ultrasound technology is particularly useful in situations where anatomy is altered; elicitation of neurostimulation is painful or not possible as well as for failed block rescue. Ultrasound assisted nerve block has been described for localization of the brachial plexus, femoral nerve, lumbar plexus and sciatic nerve. Performance of ultrasound guided nerve blocks in clinical practice is a skill and needs to be acquired by practice. Ultrasound imaging may transform the art of regional anesthesia into a science.

ACKNOWLEDGEMENT

*First and foremost thanks to **ALLAH**, the most beneficent and merciful.*

*I wish to express my deep appreciation and sincere gratitude to **Prof. Dr. Mohsen Abd Elghany Basiony** Prof. of anesthesiology and intensive care medicine, Ain Shams University, who suggested this subject for reviewing and for his supervision, continuous help and patience. It was a great honor to me to work under his supervision.*

*I wish to express my sincere thanks and deepest gratitude to **Ahmed M Elsayed Alhennawy**,. Lecturer of anesthesiology and intensive care medicine, Ain Shams University for his eminent guidance, encouragement and revision throughout the work.*

*Also, I would like to express my sincere thanks and deep gratitude to to **Amr Ahmed Kasem,** Lecturer of anesthesiology and intensive care medicine, Ain Shams University, for his keen and valuable guidance and encouraging for applying some of these techniques.*

Last, but no least, I want to thank my family, colleagues and friends that without their help this work could not have been completed.

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