INFORMED CONSENT

Effect of Intraoperative Muscle Relaxation Reversal on the Success Rate of Motor Evoked Potential recording in Patients Undergoing Spinal Surgery

Project entrust organization: Beijing Tiantan Hospital

Contract Research Organization: N/A

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INFORMATION SHEET

You will receive ***thoracic or lumbar spinal surgery***. We would like to invite you to participate our study, which is ***" Effect of Intraoperative Muscle Relaxation Reversal on the Success Rate of Motor Evoked Potential recording in Patients Undergoing Spinal Surgery"***, to evaluate the success rate of intraoperative muscle relax reversal by sugammadex on intraoperative TceMEP recording. This study is approved by Ethics Committee of Beijing Tiantan Hospital of Capital Medical University.During our study, we will follow the Declaration of Helsinki.

Before you decide whether participate this clinical trial, please take time to review this information carefully. This form describes the purpose, procedure, study duration, risks, and possible benefits of participating the study. You may also wish to talk to others, including your friends, family, or discuss with your anesthesiologist about your participation in this study.

1. PURPOSE of THIS STUDY

Intraoperative neuromonitoring (IOM) uses a combination of motor evoked potentials (MEPs) and somatosensory evoked potentials (SSEPs) to test neural integrity during spinal surgery. This method is reliable and validated for assessing spinal cord function. The Transcranial motor evoked potentials monitoring (TceMEPs) signals are exquisitely sensitive to neuromuscular blockade (NMB), the use of NMB is avoided except during intubation. However, appropriate muscle relaxation optimizes anaesthetic management, facilitates surgery, and prevents patient movement. Sugammadex is a modified γ-cyclodextrin derivative that selectively binds to NMB (rocuronium and vecuronium), which can reverse the rocuronium-induced neuromuscular blockade at the neuromuscular junction. The efficacy of reversing various levels of rocuronium block has been confirmed by multiple studies. Therefore, this study is a trial to compare the success rate of TceMEPs recording under partial NMB and no NMB reversed by sugammadex in spinal surgery.

2. NUMBER of PARTICIPANTS

In total, 162 patients will be included in the study.

3. WHO WILL PARTICIPANT IN THIS STUDY

- Age range from 18 to 65 years old
- American Society of Anaesthesiologists (ASA) physical status I to II

4. WHO SHOULD NOT PARTICIPATE in the STUDY

If you have following condition, you should not participate in the study:

- BMI ≥35 kg/m-2
- History of epilepsy or use of antiepileptic drugs
- Neuromuscular disorder(s)
- Personal history or family history of malignant hyperthermia
- Allergies to sugammadex
- NMBs or other medication(s) used during general anaesthesia
- Haemoglobin <110 g/L
- TceMEPs stimulation or recorded site infection

- Preoperative neurological dysfunction in both upper extremities
- Cardiac pacemaker
- Pregnancy and lactation
- Any other investigational drugs used within 30 days of randomization or participated in another clinical trial within 30 days.

5. DURATION OF THIS STURY

This study will only be conducted during your hospital stay. You will be followed up at 2h, 24h, 48h, 72h after surgery for any adverse reactions, and your motor function will be assessed.

You can opt out of the research at any time without losing any benefits you should have received. However, if you decide to withdraw from this study during the study, we encourage you to consult with your doctor first. Considering your security issues, there may be a related check after you log out.

6. PROCESS OF THIS STUDY

If you are willing to participate in this study, your doctor will learn about your medical history, ask about your current disease, and current treatment medications to further confirm whether you are suitable for participating in this study.

If you are willing to participate in this study, during the general anesthesia of the operation, you have a half chance of using the closed-loop muscle relaxant injection system to maintain a moderate partial muscle relaxant and discontinue the muscle relaxants at the beginning of the key steps of the operation. There is also a one-half possibility of using a closed-loop muscle relaxant injection system to maintain a moderate partial muscle relaxant. At the beginning of the key steps of the operation, the muscle relaxant is discontinued, and the specific muscle relaxant antagonist is used at the same time. Later, the neurophysiologists will monitor your motor function to determine whether the operation will damage your motor function.

The day before your scheduled surgery, the researcher will determine whether you meet the inclusion-exclusion criteria of this study based on your disease and current status. If you agree to participate in the research, we will interview your medical details. After 2h, 24h, 48h, 72h, the researcher will examine your condition again. All visits will not cause you any harm. Participation in this study does not require changes to your surgical methods and postoperative treatment. Except for randomly entering a study group and receiving different administration methods of muscle relaxants, other anaesthesia management will not be affected in any way. Both medication regimens are safe. If you enter any research group, we will try your best to ensure that your surgery goes smoothly.

7. POSSIBLE BENEFITS of PARTICIPATING in the STUDY

The depth of anaesthesia and the degree of muscle relaxation will be under our strict monitoring to ensure the appropriate depth of anaesthesia and the success rate and accuracy of monitoring of TceMEPs during the operation. In addition, we will use the muscle relaxant antagonist Sugammadex free of charge for all subjects who use muscle relaxants after the operation, which will significantly reduce the occurrence of postoperative muscle relaxation and reduce complications related to muscle relaxation. The results obtained from this study may guide the use and management of intraoperative muscle relaxants in the future and bring benefits to patients undergoing similar operations.

8. POSSIBLE ADVERSE REACTIONS, RISKS and DISCOMFORT, INCONVENIENCES of PARTICIPATING in the STUDY

The adverse reactions of Sugammadex include nausea and vomiting, hypertension, and tachycardia. In this study, the dosage of Sugammadex is small and will not cause obvious adverse reactions. We have also formulated a detailed response plan if nausea and vomiting occur after surgery, you will be given antiemetic drugs; hypertension and tachycardia can be relieved by giving antihypertensive drugs.

If antagonistic drugs are not used during surgery, there may be a risk of failure in motor evoked potential monitoring. For this situation we have formulated the following remedy measures: ① Notify the surgeon and adjust the operation manipulation that may cause the failure of TceMEPs monitoring; ② Monitor the degree of muscle relaxation, and give appropriate amount of Sugammadex to maintain TOFr≥90%③Correct TceMEPs monitoring technical parameters, such as stimulation intensity, stimulation interval time and number of stimulation strings, etc.; ④ Correct Physiological parameter abnormalities that may occur during the operation, such as blood pressure, hemoglobin concentration, body temperature, arterial carbon dioxide partial pressure and body position, etc.; ⑤Adjust the depth of anesthesia under the guidance of the BIS value, and ensure that the BIS is ≤50 to avoid intraoperative awareness. The above plan will ensure your safety and the smooth progress of the operation.

If your health does suffer from research-related damage due to participation in this research, please notify the doctor immediately, who will be responsible for taking appropriate treatment measures for you. The sponsor, Beijing Tiatan Hospital, will bear the cost of treatment and provide you with corresponding financial compensation in accordance with relevant national regulations.Even if you have signed this informed consent form, you still retain all your legal rights.

9. OTHER TREATMENT CHOICE

If you do not participate in this study, you can choose your anesthesia treatment according to your anesthesiologist's suggestion.

10. YOU MAY VOLUNTARILY CHOOSE TO PARTICIPATE in the STUDY and WITHDRAW from the STUDY

Whether to participate in the study is entirely up to you. You may refuse to participate in the study or withdraw from the study at any time during the study, which will not affect your relationship with your doctor or affect your medical service or other benefits.

Before making decision, you can discuss with your family or friend， or you can talk with your doctor for any question, until you fully understand this study.

11. RELATED EXPENSES

Anesthetic drugs and surgical procedures are not free of charge. If you combine the treatment and examination required for other diseases, and if the treatment fails, the cost of changing to other treatment is not free of charge. If any medical expense happened due to adverse event, you will be exempted from the charge.

12. CONFIDENTIALITY of PERSONAL INFORMATION

Your medical records (study records /CRF, lab sheets, etc.) will be kept intact at the hospital. Your doctor will record the results of tests and other tests on your medical record. Researchers, ethics committees, and drug regulators will be allowed access to your medical records. Any public reports on the results of this study will not disclose your personal identity. We will make every effort to protect the privacy of your personal medical data within the law.

13. HOW TO GET MORE INFORMATION?

You can ask any questions about this study at any time and get answers. Your anesthesiologist will be ready to answer any of your questions before, during and after the study.

14. HOW THE STUDY MAY EFFECT YOUR LIFE?

You may feel the visit and examination uncomfortable and special arrangement is needed. You can consult your doctor in any steps of the study.

15. CONSULTING

If you have any related questions, please contact Dr. Jian Minyu (phone: 010-59976656 or cell phone: 13522550438).

If you have any concerns about your personal benefits, or you want to complain or express your concerns about the study, please contact the Ethics Committee of Beijing Tiantan Hospital, Capital Medical University (phone：010-59975178, email: ttyyirb@163.com).

SINGATURE PAGE OF AGREEMENT

Study title: Effect of Intraoperative Muscle Relaxation Reversal on the Success Rate of Motor Evoked Potential recording in Patients Undergoing Spinal Surgery

Principal Investigator: Ruquan Han, Beijing Tiantan Hospital, CMU

DECLARATION of CONSENT

I have read the introduction about the study above and have the opportunity to discuss with doctors and ask the questions about the study. All my questions have been answered satisfactorily.

I am aware of the possible risk and benefits of participating in this study. I know that participating in the study is voluntary. I have taken it into full consideration, and known that:

- I can ask my doctor for more information at any time.
- I can withdraw from this study at any time without discrimination or retaliation, and my medical treatment and rights will not be affected.

I am also aware that if I withdraw from the study, especially if I withdraw due to medication, it will be of great benefit to the whole study if I tell my doctor about my condition and complete the corresponding physical examination and physical and chemical inspection.

If I need to take any other medication due to a change in my condition, I will consult my doctor beforehand or tell him afterwards truthfully.

I agree that the ethics committee of the drug regulatory authority or the representative of the sponsor may have access to my research information.

I will be provided with a signed and dated copy of the informed consent.

In the end, I agreed to participate in the study and promised to follow my doctors' advice as much as possible.

Signature of patient/legal relative:_____

Relation: _____

Date: _____ **(yyyy/mm/dd)**

I confirm that I have explained the details of the trial to the patients, including its rights and possible benefits and risks, and have given them a signed copy of the informed consent.

Signature of doctor:_____

Date: _____ **(yyyy/mm/dd)**