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Effects of ultrasound-guided thoracolumbar interfascial plane block combined with general anaesthesia versus general anaesthesia alone on emergence agitation in children with cerebral palsy undergoing selective posterior rhizotomy: protocol for a randomised controlled clinical trial

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ABSTRACT

Introduction Selective posterior rhizotomy (SPR) is a preferred procedure for relieving spastic children with cerebral palsy, but it is associated with severe pain and significant emergence agitation (EA). The thoracolumbar interfascial plane (TLIP) block provides an effective blockade to the dorsal branch of the spinal nerve. We hypothesise that the TLIP block may be an effective tool to alleviate EA and postoperative pain scores in children with cerebral palsy undergoing SPR.

Methods and analysis This study is a single-centre, randomised, parallel-controlled trial being conducted in Beijing, China. A total of 50 paediatric patients with cerebral palsy scheduled for SPR are randomised in a 1:1 ratio to receive bilateral TLIP block with 0.2% ropivacaine 0.5 mL/kg or control. Patients in the TLIP group receive general anaesthesia combined with TLIP block, while patients in the control group receive only general anaesthesia, without a TLIP block. The primary outcome is the Paediatric Anaesthesia Emergence Delirium Score. The secondary outcomes are the incidence of EA, the Wong-Baker Faces Pain-rating Scale, the perioperative haemodynamics, the intraoperative remifentanil and propofol dosage, the extubation time and recovery time, and adverse reactions.

Ethics and dissemination This study was approved by the Ethics Committee of Dongzhimen Hospital, Beijing University of Chinese Medicine on 21 September 2023 (2023DZMEC-379–02). Written informed consent is obtained from the legal guardian of each patient. The results of this study will be published in peer-reviewed international journals.

Trial registration number ChiCTR2300076397

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study is a randomised controlled trial to evaluate the effects of ultrasound-guided thoracolumbar interfascial plane (TLIP) block on emergence agitation (EA) in children with cerebral palsy undergoing selective posterior rhizotomy (SPR).
⇒ The study fails to compare the effects of different local anaesthetic concentrations, doses and types used in TLIP block on EA after SPR, which could identify the most advantageous TLIP block anaesthetic protocol for this patient group.
⇒ TLIP block is performed after general anaesthesia, hence the actual time of onset, degree and extent of the block are not evaluated; therefore, we will be unable to make a gold standard judgement about the actual effect of TLIP.
⇒ The control group does not include a saline block, which would serve as a blank control; to minimise the children's exposure to invasive procedures, we do not perform nerve blocks on the patients in the control group, however, it is important to be aware that any invasive procedure in the perioperative period may affect EA.
⇒ Being a single-centre clinical trial with a relatively small sample size, the study does not stratify patients by age, gender or comorbidities.

INTRODUCTION

Selective posterior rhizotomy (SPR) is a neurosurgical procedure aimed at reducing spasticity. Advances in surgical techniques, perioperative analgesia, and postoperative care have mitigated the trauma and severe pain previously associated with SPR. Nevertheless, inadequate analgesia remains, increasing patient discomfort and respiratory complications. Thus, alleviating

postoperative pain continues to be challenging. Thoracolumbar interfascial plane (TLIP) block, commonly used for analgesia during the perioperative period,[1] has not been thoroughly investigated for additional clinical benefits.

Emergence agitation (EA) is characterised as a self-limiting state of psychomotor arousal occurring during the emergence from general anaesthesia. Paediatric patients are particularly prone to EA following general anaesthesia. Symptoms of EA include restlessness, disorientation, euphoria and aimless movements. Clinically, EA can result in serious outcomes such as injury to the patient or healthcare provider, falls from the bed, surgical site bleeding, unintended extubation, respiratory depression and increased healthcare costs.[2 3] Pain is widely recognised as a significant risk factor for EA.[4]

To our knowledge, no studies have yet investigated the effect of ultrasound-guided TLIP block on EA in children with cerebral palsy undergoing SPR. Research focusing on children with cerebral palsy is advantageous, given the specific characteristics of this population and the potential reduction of confounding variables. Our study is distinctive, involving children with cerebral palsy undergoing SPR. We hypothesise that TLIP block will alleviate EA in this patient group.

METHODS AND ANALYSIS

Trial design and setting

This randomised trial is underway at Dongzhimen Hospital, Beijing University of Chinese Medicine, Beijing, China. The protocol is reported in accordance with the Standard Protocol Items: Recommendations for Interventional Trials 2013 statement. The Consolidated Standards of Reporting Trials guidance will be followed when reporting the findings of the trial. The flow chart of the trial design and follow-up are shown in figure 1 and table 1.

Participant eligibility and consent

Patients diagnosed with cerebral palsy scheduled for SPR procedure at Dongzhimen Hospital, Beijing University of Chinese Medicine are screened and recruited for eligibility. Recruitment is finalised at the preoperative interview 1 day before surgery by a specialised researcher. Informed written consent is obtained from the legal guardian of the patients. Legal guardian consent form is presented in the online supplemental file.

Inclusion criteria

1. Children scheduled for SPR.
2. Age between 4 years and 12 years.

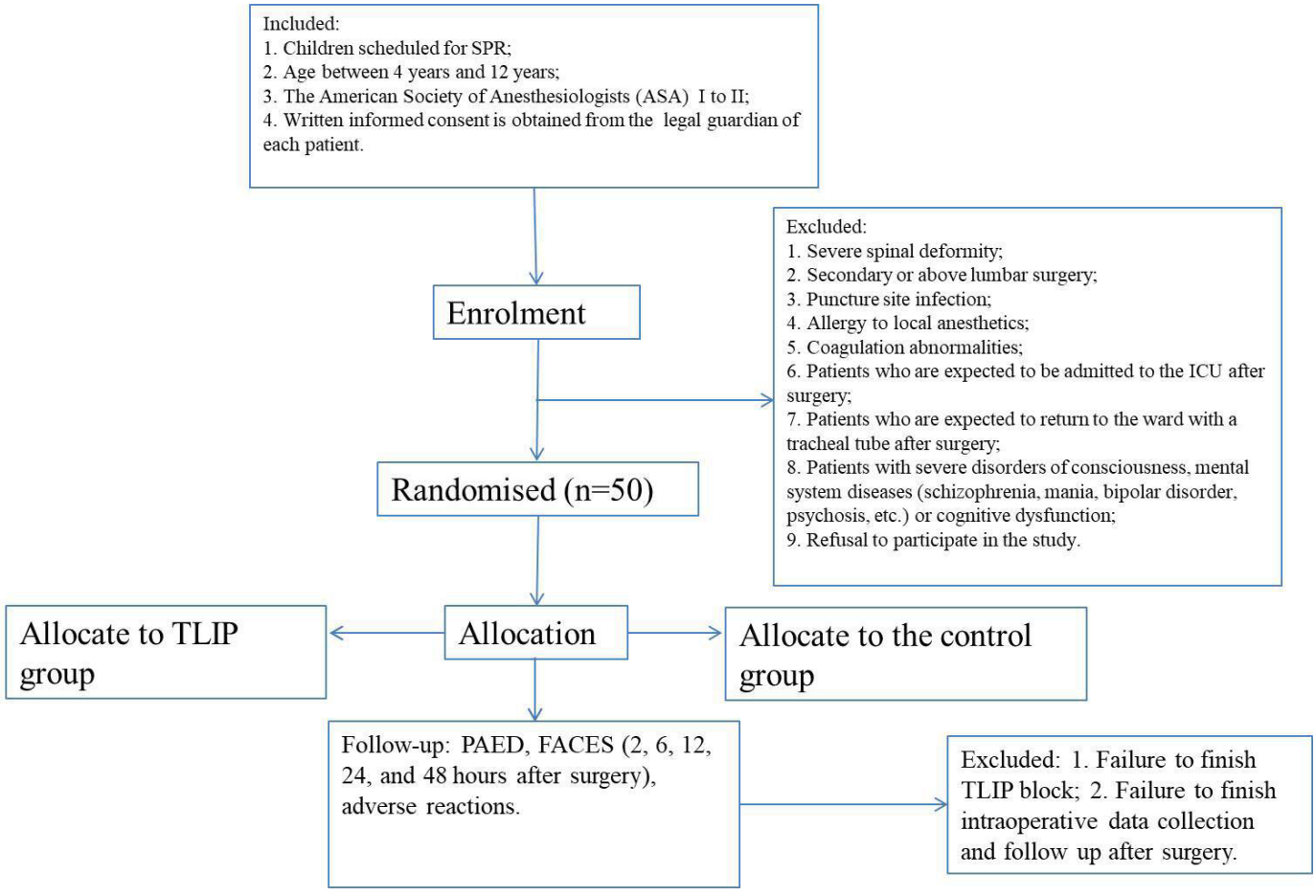

Figure 1 Trial flow chart. FACES, Wong-Baker Faces Pain-rating Scale; ICU, intensive care unit; PAED, paediatric anaesthesia emergence delirium; SPR, selective posterior rhizotomy; TLIP, thoracolumbar interfascial plane.

Table 1 Study schedule

Study component	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6	Visit 7	Visit 8	Visit 9
Time	1 day before surgery	After general anaesthesia	End of surgery	2 hours after surgery	6 hours after surgery	12 hours after surgery	24 hours after surgery	48 hours after surgery	Discharge
Eligibility screen	X	–	–	–	–	–	–	–	–
Informed consent	X	–	–	–	–	–	–	–	–
Demographic characteristics	X	–	–	–	–	–	–	–	–
Randomisation	X	–	–	–	–	–	–	–	–
Intervention	–	X	–	–	–	–	–	–	–
Intraoperative opioid consumption	–		X	–	–	–	–	–	–
FACES	–	–	–	X	X	X	X	X	–
Adverse events	–	–	–	–	–	–	–	X	–

FACES, Wong-Baker Faces Pain-rating Scale.

3. The American Society of Anesthesiologists I to II.
4. Written informed consent is obtained from the legal guardian of each patient.

Exclusion criteria

1. Severe spinal deformity.
2. Secondary or above lumbar surgery.
3. Puncture site infection.
4. Allergy to local anaesthetics.
5. Coagulation abnormalities.
6. Patients who are expected to be admitted to the intensive care unit after surgery.
7. Patients who are expected to return to the ward with a tracheal tube after surgery.
8. Patients with severe disorders of consciousness, mental system diseases (schizophrenia, mania, bipolar disorder, psychosis, etc) or cognitive dysfunction.
9. Refusal to participate in the study.

Intervention

Both groups

All children undergo a fast for 8–12 hours. On entry into the operating room, standard monitoring is implemented, including measurements of blood pressure, ECG, partial oxygen pulse oximetry and Bispectral Index. General anaesthesia is induced using fentanyl 3 µg/kg, cis-atracurium 0.15 mg/kg and propofol 2.5 mg/kg. Following anaesthesia induction, endotracheal intubation and mechanical ventilation are initiated. Anaesthesia depth is regulated through a micropump infusion of propofol (4–10 mg/kg/hour) and remifentanil (0.1–0.4 µg/kg/min), adjusted according to intraoperative monitoring and surgery duration. Intravenous patient-controlled analgesia (PCA) is administered in both groups immediately at the end of surgery, continuing for up to 48 hours. PCA consists of sufentanil 2 µg/kg + 0.9% saline to 100 mL, with a 15 min lockout interval, a background infusion of 1 mL/hour, and an option for a self-administered additional dose of 2 mL.

TLIP group

The experimental group receives bilateral TLIP block. An ultrasound probe is positioned in the paraspinal sagittal position for the longitudinal scanning. The transverse process of the L3 vertebral body is located by the iliac image and the probe is rotated 90° to the short-axis plane to visualise the paraspinal thoracolumbar fascial space. The needle is inserted laterally between the longissimus and iliocostalis muscles using an in-plane access technique and 0.2% ropivacaine 0.5 mL/kg is injected after a bloodless retraction (figure 2). The maximum dose should not exceed 20 mL. A similar procedure is conducted on the contralateral side.

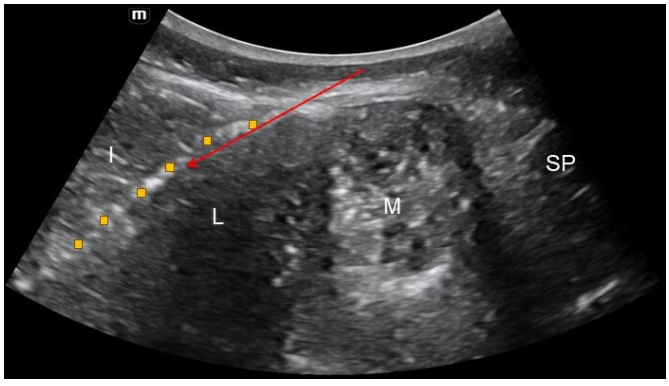

Figure 2 Ultrasound-guided thoracolumbar interfascial plane block. The interface between L and I muscles is marked with yellow dots. The red arrow shows the direction of needle insertion. I, iliocostalis muscle; L, longissmus muscle; M, multifidus muscle; SP, spinous process.

Control group

Patients in the control group receive only general anaesthesia, without a TLIP block.

Outcomes

Primary outcome

The primary outcome of this study is the score of paediatric anaesthesia emergence delirium (PAED).

Secondary outcomes

- Incidence of EA (cut-off of 12 points[5]) and severe EA (cut-off of 15 points[6]).
- The pain degree is assessed at 2 hours, 6 hours, 12 hours, 24 hours and 48 hours after surgery, respectively, according to the Wong-Baker Faces Pain-rating Scale.
- Perioperative haemodynamics.
- Intraoperative remifentanil and propofol dosage.
- Extubation time and recovery time.
- Adverse reactions.

Participant timeline

For included participants, enrolment is performed 1 day before surgery and reconfirmed on the day of the procedure. Then random allocation is performed by a specific statistician before intervention. Patient recruitment began on 8 October 2023, and is expected to end on 30 December 2024.

Sample size

The minimal sample size was obtained based on a preliminary study with 10 patients, which indicated that the PAED Scores in the TLIP group and the control group were 10 and 8, respectively, with an SD of 1.8. Considering type I error of 0.05 and type II error of 0.1, we planned to recruit at least 25 patients per group to compensate for the loss in follow-up.

Allocation

This is a randomised, controlled trial. The random allocation sequence is conducted using a professional online tool for randomised clinical trials called "Randomizer" (https://www.randomizer.at/, Randomizer V.2.1.0, Institute for Medical Informatics, Statistics and Documentation, Medical University of Graz). The treatment is concealed in sequentially numbered, opaque, sealed envelopes in the custody of a secretary who is not involved in the trial. Randomisation takes place after the participants' final confirmation of enrolment.

Blinding

Participants are unaware of the distribution. The block is performed after general anaesthesia. Anaesthesiologists perform the nerve block and are responsible for intraoperative management. Investigators not involved in the nerve block and intraoperative management are designated for postoperative follow-up. In addition, trained anaesthesiologists designated not to perform the block objectively assess the clinical characteristics of the TLIP block.

Adverse event reporting and harms

Safety monitoring is always followed throughout the study. All adverse events associated with the study interventions will be documented in the study database and reported to the Adverse Event Registry System of Dongzhimen Hospital, Beijing University of Chinese Medicine as required within a specified time frame based on severity. The Clinical Trial Oversight Committee of Dongzhimen Hospital, Beijing University of Chinese Medicine is responsible for deciding whether to stop this study on a case-by-case basis.

Clinically relevant adverse events associated with treatment will be taken into account: injection site infection, pneumothorax and local anaesthetic toxicity over the trial period. If an adverse event occurs, the researcher should explain it to the participant's legal guardian and require the participant's legal guardian to truthfully report any changes in his/her children's condition after treatment. For adverse events occurring during the study, the symptoms, extent, time of occurrence, duration, treatment and experience should be recorded on thecase report form (CRF). If a serious adverse event occurs in the study, the project leader must adopt immediate actions to ensure the safety of the subjects. The investigator should also inform the ethics committee, the data monitoring committee and the relevant regulatory bodies of the expectedness, severity, gravity and causality, as necessary. When a severe adverse incident happens in a clinical study that warrants urgent unblinding, the study should be unblinded by the project leader, the investigator and the clinical supervisor.

Data collection and management

Preoperative, intraoperative and postoperative follow-up data are gathered and stored properly as study material. All collected data are enrolled in a CRF, designed for each included patient. All data are input into the electronic case report file and any traces of entries, modifications, deletions, and so on, will be kept in a log showing who made the changes and when. Paper-based data are entered into the electronic case report file by two research assistants using duplicate entries. Electronic data are copied and the copied electronic data are kept by others. The researcher double-checks the data against the CRF to confirm the quality of the data. A particular biostatistician finishes the screening and randomisation of the study data.

Participant retention and withdrawal

Participants are followed up by the clinical coordinator of the study. All participants have the right to withdraw from the study at any stage. If a patient determines to do so, this will not jeopardise the relationship with the investigator and they will proceed to obtain the best possible therapy. Once a patient has withdrawn from the study, the experimenter will ask if they agree to complete follow-up and

if they are willing to accept being used with their data. If a participant is comfortable giving this information, any data already gathered by that participant will be analysed independently before unblinding, and finally interpreted in a separate section of the results of this trial.

Statistical methods

The statistical analysis will be carried out with the statistical software SPSS V.25 (IBM, Armonk, New York). The distribution of the data will be evaluated using the Kolmogorov-Smirnov test. Normally distributed continuous variables will be shown as mean (SD), and those without normally distributed data will be performed as median (IQR). Categorical variables will be shown as numbers (percentages). Between-group differences will be assessed by performing the independent Student's t-test for continuous normal variables, while non-parametrical data will be compared by the Mann-Whitney U test, as appropriate. A χ^2 test or Fisher's exact test will be conducted for categorical variables. Repeated-measures analysis of variance will be used within groups for data with normal distribution. For variables with non-normal distribution, the Friedman test will be carried out for repeated measures. Subgroup analyses are performed based on age. Any changes to the statistical analysis programme will be noted in the next publications. Bonferroni correction will be performed for multiple tests. A value of $p<0.05$ will be regarded as statistically significant.

Patient and public involvement

None.

ETHICS AND DISSEMINATION

Ethical approval

The study was approved by the Ethics Committee of the Dongzhimen Hospital, Beijing University of Chinese Medicine (Approval-No: 2023DZMEC-379–02). The trial is carried out according to the Declaration of Helsinki, and the International Conference on Harmonisation. Collected variables are not associated with any individual or personal identifiers. Written informed consent to participate is acquired from all participants' legal guardians.

Informed consent process

All subjects in this study will be younger than 16 years of age and therefore written informed consent from a legal guardian will be required.

Protocol amendments

All changes to the research programme must be approved. All proposed protocol revisions will be made by the principal investigator. All revised protocols will be initialled by the staff member and the revision form will be presented to the ethics committee for approval. All protocol violations will be fully documented using the Noncompliance Reporting Form. The protocol will also be updated in the Clinical Trials Register.

Data retention

To guarantee evaluations and audits from regulatory authorities, data acquired from participants will be kept confidential and securely stored at the Department of Anesthesiology, Dongzhimen Hospital, Beijing University of Chinese Medicine for at least 5 years. The investigators will retain records that include the identity of all participants, all original signed informed consents, severe negative events recordings, and the CRF. The data will be reserved securely and will not be shared with anyone else without appropriate authorisation.

Dissemination plans

The current trial was registered at the Chinese Clinical Trial Registry (ChiCTR2300076397) on 8 October 2023, before patient recruitment began. The results of the study, whether positive or negative, will be presented in an international peer-reviewed medical journal. The data sets analysed during the study will be available from the corresponding author on appropriate request.

DISCUSSION

EA is recognised as a primary risk factor for serious complications including anxiety, eating and sleeping disorders, enuresis, and persistent secondary alterations in mood and cognitive development. Children are particularly susceptible to EA.[7 8] EA adversely affects hospital management and places a burden on nursing staff due to the risk of self-harm and other injurious behaviours, leading to reduced satisfaction among patients and their families. Thus, managing EA in children poses a significant challenge for healthcare workers.

The PAED Scale, developed by Sikich and Lerman[9] in 2004, has undergone validation and reliability testing and is widely used to assess EA in paediatric patients. This scale includes five psychometric items that characterise emergent behaviours. Scores range from 0 to 20, with higher scores indicating greater agitation. In several studies, EA is defined as a PAED Score of ≥10.[9–11] However, some studies suggest a threshold of ≥12 offers improved sensitivity and specificity.[12 13] Additionally, the incidence of EA does not provide a measure of its severity. Consequently, the PAED Score has been extensively employed to evaluate EA in paediatric patients[14 15] and was thus selected as our primary outcome.

In 2015, the TLIP block was initially applied to volunteers by Hand *et al*, yielding satisfactory analgesia in the lumbar region.[16] Performed as an interfascial plane block at the L3 vertebra level during spinal surgery, it provides excellent analgesia.[16] Subsequent studies have confirmed that the TLIP block is an effective analgesic technique for lumbar spine surgery in adults.[17 18] Ultrasound-guided TLIP block is associated with a low incidence of opioid-related complications and features a relatively superficial puncture site, enhancing both its safety and ease of implementation.[19]

As an anaesthesiologist, one must carefully assess the safety and necessity of performing a nerve block by evaluating the risks and benefits. At Dongzhimen Hospital, Beijing University of Chinese Medicine, the inplane ultrasound-guided technique for the TLIP block is typically administered by experienced anaesthesiologists to minimise associated risks. Consequently, we designed this study to explore whether the TLIP block, noted for its ease of use, could serve as a viable option that provides additional clinical benefits in terms of analgesia. To our knowledge, this is the inaugural trial assessing the TLIP block's effectiveness in reducing EA in children with cerebral palsy undergoing SPR. The anticipated results aim to substantiate the TLIP block's impact and advocate for its use in paediatric patients. This study intends to refine multimodal analgesic protocols for children undergoing SPR, thereby enhancing their prognosis.

However, this study is not without limitations. First, it does not compare the effects of different local anaesthetic concentrations, doses and types used in TLIP block on EA after SPR, which could identify the most advantageous TLIP block anaesthetic protocol for this patient group. Second, TLIP block is performed after general anaesthesia, hence the actual time of onset, degree and extent of the block are not evaluated. Therefore, we cannot draw a gold standard judgement about the actual effect of TLIP. Third, the control group does not include a saline block, which serves as a blank control. To minimise the children's exposure to invasive procedures, we do not perform nerve blocks on the patients in the control group. However, it is important to be aware that any invasive procedure in the perioperative period may affect EA. Lastly, being a single-centre clinical trial with a relatively small sample size, the study does not stratify patients by age, gender or comorbidities. Nevertheless, this preliminary study compares the effects of TLIP block combined with general anaesthesia against general anaesthesia alone on EA in children with cerebral palsy undergoing SPR. Plans are underway to conduct a more extensive, multicentre study to confirm the safety of TLIP block and address the aforementioned shortcomings.

Trial status

At the time the present protocol manuscript was submitted, the study had been initiated and several patients were enrolled in the trial. Recruitment began on 8 October 2023. Inclusion will continue until recruitment is complete. The study is anticipated to be completed by December 2024.

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Contributors XL and HR were responsible for the initial conception of the clinical trial and wrote the manuscript. KX, JZ and GL contributed to the study design. XH and YS revised the manuscript. All authors contributed to and approved the final manuscript. HR is responsible for the overall content as guarantor.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

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REFERENCES

1 Ye Y, Bi Y, Ma J, *et al*. Thoracolumbar interfascial plane block for postoperative analgesia in spine surgery: a systematic review and meta-analysis. *PLoS One* 2021;16:e0251980.
2 Scott GM, Gold JI. Emergence delirium: a re-emerging interest. *Semin Anesth Perioper Med Pain* 2006;25:100–4.
3 Kuratani N, Oi Y. Greater incidence of emergence agitation in children after sevoflurane anesthesia as compared with halothane: a meta-analysis of randomized controlled trials. *Anesthesiology* 2008;109:225–32.
4 Kanaya A. Emergence agitation in children: risk factors, prevention, and treatment. *J Anesth* 2016;30:261–7.
5 Klabusayová E, Musilová T, Fabián D, *et al*. Incidence of Emergence Delirium in the Pediatric PACU: Prospective Observational Trial. *Children (Basel)* 2022;9:1591.
6 Han X, Sun X, Liu X, *et al*. Single bolus dexmedetomidine versus propofol for treatment of pediatric emergence delirium following general anesthesia. *Paediatr Anaesth* 2022;32:446–51.
7 Mihara T, Nakamura N, Ka K, *et al*. Effects of melatonin premedication to prevent emergence agitation after general anaesthesia in children: A systematic review and meta-analysis with trial sequential analysis. *Eur J Anaesthesiol* 2015;32:862–71.
8 Manworren RCB, Paulos CL, Pop R. Treating children for acute agitation in the PACU: differentiating pain and emergence delirium. *J Perianesth Nurs* 2004;19:183–93.
9 Sikich N, Lerman J. Development and psychometric evaluation of the pediatric anesthesia emergence delirium scale. *Anesthesiology* 2004;100:1138–45.
10 Lin Y, Shen W, Liu Y, *et al*. Visual preconditioning reduces emergence delirium in children undergoing ophthalmic surgery: a randomised controlled trial. *Br J Anaesth* 2018;121:476–82.
11 Nakamura N, Mihara T, Hijikata T, *et al*. Unilateral electrical stimulation of the heart 7 acupuncture point to prevent emergence agitation in children: A prospective, double-blinded, randomized clinical trial. *PLoS One* 2018;13:e0204533.
12 Bajwa SA, Costi D, Cyna AM. A comparison of emergence delirium scales following general anesthesia in children. *Paediatr Anaesth* 2010;20:704–11.
13 Hino M, Mihara T, Miyazaki S, *et al*. Development and Validation of A Risk Scale for Emergence Agitation After General Anesthesia in Children: A Prospective Observational Study. *Anesth Analg* 2017;125:550–5.
14 Kanaya A, Mihara T, Tanaka S, *et al*. Association between the Depth of Sevoflurane or Propofol Anesthesia and the Incidence of

Emergence Agitation in Children: A Single-Center Retrospective Study. *Tohoku J Exp Med* 2023;260:93–8.
15 Mo X, Zeng J, Wu X, *et al*. Sucking lollipop after awakening from sevoflurane anesthesia reduces the degree of emergence agitation in children undergoing ambulatory surgery: A prospective randomized controlled trial. *Medicine (Baltimore)* 2023;102:e35651.
16 Hand WR, Taylor JM, Harvey NR, *et al*. Thoracolumbar interfascial plane (TLIP) block: a pilot study in volunteers. *Can J Anaesth* 2015;62:1196–200.
17 Pavithran P, Sudarshan P, Eliyas S, *et al*. Comparison of thoracolumbar interfascial plane block with local anaesthetic infiltration in lumbar spine surgeries – A prospective double-blinded randomised controlled trial. *Indian J Anaesth* 2022;66:436–41.
18 Kumar A, Sinha C, Kumar A, *et al*. Modified Thoracolumbar Interfascial Plane Block Versus Erector Spinae Plane Block in Patients Undergoing Spine Surgeries: A Randomized Controlled Trial. *J Neurosurg Anesthesiol* 2024;36:119–24.
19 Eltaher E, Nasr N, Abuelnaga ME, *et al*. Effect of Ultrasound-Guided Thoracolumbar Interfascial Plane Block on the Analgesic Requirements in Patients Undergoing Lumbar Spine Surgery Under General Anesthesia: A Randomized Controlled Trial. *J Pain Res* 2021;14:3465–74.