Establishment of a scoring system for predicting emergence agitation after general anesthesia in children

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Background

Emergence agitation (EA) is a common complication after general anesthesia in children.
The aim of this study was to develop an EA risk score by two-phased (development and validation phases) study.

Methods

Development phase

- Analyzed the data from our past RCT* by using logistic regression.
- Determined the best predictive model for EA.

Validation phase

- Assessed the incidence of EA using a PAED scale.
- Examined the predictive ability of the EA risk score by generating a receiver operating characteristic (ROC) curve.

Subjects (common to both phases)

Patients: children aged 1.5–9 years
Operations: minor surgeries**
Anaesthesia: general anaesthesia with sevoflurane (and regional anaesthesia)

*The effect of meridian stimulation on EA after sevoflurane anaesthesia was studied with 120 children. (*Eur J Anaesthesiol* 2015)

**inguinal hernia repair, umbilical hernia repair, cryptorchidism repair, scrotum edema, adenoidectomy, tonsillectomy, tubing, and strabismus surgery

Results

A) Characteristic

	Phase1 (n=120)	Phase2 (n=81)
age (months)	48.5 (33.8 – 64.5)	54.5 (33 – 72)
sex (male:female)	88:37	55:26
weight (kg)	15.8 (13.2 – 18.4)	15.4 (12.6 – 19)
Type of operation		
Strabismus surgery	12	5
Tonsillectomy	16	12
Inguinal hernia repair	33	46
Others	59	18
Anaesthesia time (min)	76.5 (47 – 99)	60 (42 – 92)

B) The EA risk score

	Score
Age (year)	9 – Age
Operative procedure	
Strabismus surgery	7
Tonsillectomy	7
Others	0
Preoperative behavior score	
Screaming or shouting	4
Tearful and/or withdrawn but compliant with induction	2
Calm and controlled	0
Anaesthesia time	
> 2 hours	4
1 to 2 hours	2
< 1 hour	0
Total	= The EA risk score

- The score ranged 0–23 points and included four factors.

C) The ROC curve

- The similar results between the different set of patients indicated the validity of the EA risk score.

Conclusion

We established and validated the EA risk score for children, with relatively high accuracy.