



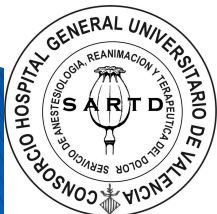
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**Delirium agudo tras anestesia del paciente pediátrico. Análisis de posibles etiologías y manejo clínico.**  
***“Emergence delirium in children”***

**Dra. Irene Casanova Montes.  
Dr. William Martínez Martínez**

**Servicio de Anestesia Reanimación y Tratamiento del Dolor  
Consorcio Hospital General Universitario de Valencia**



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Valencia 14 de Octubre de 2014**

# Emergence delirium in children

REVIEW



Curr Opin Anesthesiol 2014, 27:309–315

## Emergence delirium in children: an update

*Souhayl Dahmani<sup>a,b,c</sup>, Honorine Delivet<sup>d,e</sup>, and Julie Hilly<sup>a,b</sup>*

### Paediatric emergence delirium

Leila L Reduque  
Susan T Verghese



Continuing Education in Anaesthesia, Critical Care & Pain | Volume 13 Number 2 2013

Review Article

### Emergence Delirium in Children: Many Questions, Few Answers

Gordana P. Vljakovic, MD\*†  
Radomir P. Sindjelic, MD, PhD\*†

The introduction of a new generation of inhaled anesthetics into pediatric clinical practice has been associated with a greater incidence of ED, a short-lived, but troublesome clinical phenomenon of uncertain etiology. A variety of anesthesia-, surgery-, patient-, and adjunct medication-related factors have been suggested to play a potential role in the development of such an event. Restless behavior upon emergence causes not only discomfort to the child, but also makes the caregivers and parents feel unhappy with the quality of recovery from anesthesia. Although the severity of agitation varies, it often requires additional nursing care, as well as treatment with analgesics or sedatives, which may delay discharge from hospital. To reduce the incidence of this adverse event, it is advisable to identify children at risk and take preventive measures, such as reducing preoperative anxiety, removing postoperative pain, and providing a quiet, stress-free environment for postanesthesia recovery. More clinical trials are needed to elucidate the cause as well as provide effective treatment.

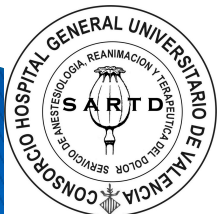
(Anesth Analg 2007;104:84–91)



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# Emergence delirium in children

- ❖ **Introducción**
- ❖ **Definición**
- ❖ **Causas**
- ❖ **Presentación clínica**
- ❖ **Diagnóstico**
- ❖ **Prevención**
  - ❖ **Farmacológica**
  - ❖ **No farmacológica**
- ❖ **Tratamiento**



# Emergence delirium in children

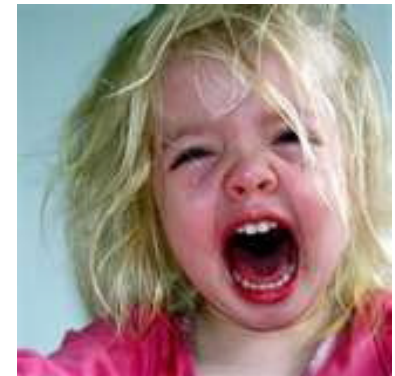
## Introducción

**No es un fenómeno nuevo. En 1960 Eckenhoff fue el primero en describir los signos de hiperexcitación en el despertar con el uso de Ether, cyclopropano**

**Disminución de la ED con el uso del Halotano y control del dolor**

**Para aquellos que realizan ocasionalmente anestesia en niños el ED es uno de los eventos postoperatorio mas “aterradores”**

**Considerada como complicación misteriosa**



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# Emergence delirium in children

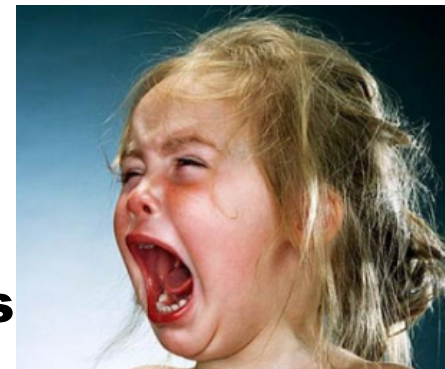
## Definición

**Es un estado de disociación de la conciencia en que el niño está irritable, intransigente, poco cooperativo, incoherente e inconsolable, llorando, gimiendo, pateando.**

**Por lo general, estos niños no reconocen o identifican objetos o personas familiares.**

**Pueden presentar también Delirios paranoides**

**Se describe a menudo como un comportamiento combativo más que la simple inquietud e incoherencia**



# Emergence delirium in children

## Causas

Origen del ED sigue siendo **desconocido**

## Hipótesis

❑ **El dolor postoperatorio**

**Sin embargo los pacientes no informan que hayan presentado dolor postoperatorio después de recuperar su estado normal.**

**Aparición de ED en procedimientos NO dolorosos**



# Emergence delirium in children

## Hipótesis

- ❑ **La farmacocinética y farmacodinamia de los agentes anestésicos**
  - ✓ **Diferencia en tasa de eliminación de los agentes anestésicos volátiles del SNC, lo que lleva a una diferencia en la recuperación de las funciones cerebrales**
  - ✓ **La incidencia de ED desde la introducción de agentes anestésicos volátiles de acción rápida como el Sevoflurano y Desflurano**

Database of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews.

**Greater incidence of emergence agitation in children after sevoflurane anesthesia as compared with halothane: a meta-analysis of randomized controlled trials**

Review published: 2008.

Bibliographic details: 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(2): 225-232. [[PubMed](#)]

**CONCLUSIONS:** This meta-analysis revealed that emergence agitation occurred more frequently with [sevoflurane](#) than with halothane anesthesia in children.



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# Emergence delirium in children

✓ **Cambios en la conectividad en las áreas cerebrales mientras se esta anestesiado.**

**A. Red de conectividad funcional en reposo**

**B. Red de conectividad funcional dinámica( Red de control ejecutivo)**

*Neuroreport*. 2005 Feb 28;16(3):285-8.

**Functional connectivity changes with concentration of sevoflurane anesthesia.**

Peltier SJ<sup>1</sup>, Kerssens C, Hamann SB, Sebel PS, Byas-Smith M, Hu X.

[Author information](#)

*Brain Res*. 2010 March 8; 1318: 110–121. doi:10.1016/j.brainres.2009.12.075.

**Altered Local Coherence in the Default Mode Network due to Sevoflurane Anesthesia**

Gopikrishna Deshpande<sup>1</sup>, Chantal Kerssens<sup>2</sup>, Peter Simon Sebel<sup>2</sup>, and Xiaoping Hu<sup>1</sup>

<sup>1</sup>Department of Biomedical Engineering, Georgia Institute of Technology and Emory University, Atlanta, GA, USA

<sup>2</sup>Department of Anesthesiology, Emory University School of Medicine, Atlanta, GA, USA

✓ **Diversos estudios revelan que la rapidez en la educación anestésica no han mostrado asociación con una mayor incidencia de ED**

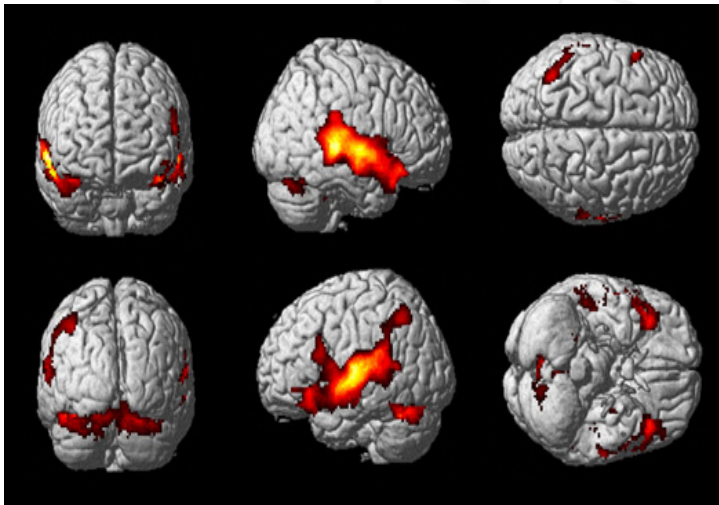




# Emergence delirium in children

## Hipótesis

- **La inmadurez psicológica de niños y su falta de adaptación a la ansiedad perioperatoria durante el período perioperatorio también podrían participar en la génesis del ED**



# Emergence delirium in children

## Presentación clínica

**Incidencia varia del 2 al 80%**

## Factores de riesgo

- ❑ **Frecuente en niños preescolares**  
**Sevoflurano → 40% En preescolar frente al 11,5% en escolares**
- ❑ **Anestésico inhalatorio de rápida acción. Sevoflurano/ Desflurano**
- ❑ **Sexo masculino**



# Emergence delirium in children

## Factores de riesgo

### □ Rápido despertar de la anestesia

**Este meta-análisis mostró que el Propofol, Ketamina, agonistas alfa adrenérgicos, Fentanyl y el uso de analgesia preoperatoria reduce el riesgo de ED presumiblemente retrasando el despertar y reduciendo el dolor postoperatorio**

*British Journal of Anaesthesia* 104 (2): 216–23 (2010)  
doi:10.1093/bja/aep376 Advance Access publication January 3, 2010

BJA

PAEDIATRICS

**CME** **Pharmacological prevention of sevoflurane- and desflurane-related emergence agitation in children: a meta-analysis of published studies**

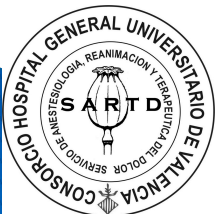
S. Dahmani<sup>1\*</sup>, I. Stany<sup>1</sup>, C. Brasher<sup>1</sup>, C. Lejeune<sup>1</sup>, B. Bruneau<sup>1</sup>, C. Wood<sup>1</sup>, Y. Nivoche<sup>1</sup>,  
I. Constant<sup>2</sup> and I. Murat<sup>2</sup>

<sup>1</sup>Department of Anesthesiology, Robert Debre University Hospital, Assistance Publique des Hôpitaux de Paris, 48 Bd Serurier, 75019 Paris, France. <sup>2</sup>Department of Anesthesiology, Trousseau University Hospital, Assistance Publique des Hôpitaux de Paris, 26 avenue du Docteur Arnold-Netter, Paris, France

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**Conclusions.** This meta-analysis found that propofol, ketamine, fentanyl, and preoperative analgesia had a prophylactic effect in preventing EA. The analgesic properties of these drugs do not seem to have a role in this effect.

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# Emergence delirium in children

## Factores de riesgo

- ❑ **Procedimientos quirúrgicos otorrinolaringológicos**
- ❑ **Ansiedad preoperatoria**
- ✓ **La mala adaptabilidad preoperatoria podría afectar cuando el niño se enfrenta a una situación de ansiedad**
- ✓ **La ansiedad preoperatoria es el segundo factor que se cree estar asociada con ED**

## Predictores clásicos de la ansiedad preoperatoria en los niños

Niños pequeños	Ansiedad de los padres	Pocos hermanos
Perfil psicológico	Escasez habilidades sociales y adaptativas	Mala experiencia médica previa



# Emergence delirium in children

## Factores de riesgo

- ❑ **Temperamento del niño ha sido identificado como un factor de riesgo para la ED**

**Se refleja en los niños que son:**

- ✓ **Más emocionales**
- ✓ **Más impulsivos**
- ✓ **Menos sociables**
- ✓ **Y con menos capacidad de adaptación**



# Emergence delirium in children

## Diagnóstico

**Sikich y Lerman Table 1:** Pediatric Anesthesia Emergence Delirium (PAED) scales

Point	Description of Items	Scoring				
		not at all	just a little	quite a bit	very much	extremely
1	The child makes eye contact with the caregiver	4	3	2	1	0
2	The child's actions are purposeful	4	3	2	1	0
3	The child is aware of his/her surroundings	4	3	2	1	0
4	The child is restless	0	1	2	3	4
5	The child is inconsolable	0	1	2	3	4

**Una sensibilidad del 64% y una especificidad del 86%.  
Cualquier puntuación de > ó igual a 10 es indicativo de ED.**

**El diagnóstico principalmente es **CLÍNICO**, teniendo en cuenta los factores de riesgo y descartando posibles causas de agitación**



# Emergence delirium in children

## Diagnóstico

**Table 1** Cravero scale

Behaviour	Score
Obtunded with no response to stimulation	1
Asleep but responsive to movement or stimulation	2
Awake and responsive	3
Crying (for >3 min)	4
Thrashing behaviour that requires restraint	5

**The Cravero scale is a five-point scale. The definition for ED in this scale is reached if level 4 or 5 was evident and present for at least 3 minutes. The Cravero scale has the advantage of simplicity**

**Table 3** Watcha scale. Score is observed values

Behaviour	Score
Asleep	0
Calm	1
Crying, but can be consoled	2
Crying, but cannot be consoled	3
Agitated and thrashing around	4

**The Watcha scale is a four-point scale as shown in Table 3 and defines ED at a level of 3 or 4 at any time. The Watcha scale has a higher correlation than Cravero with respect to the PAED scale**



# Emergence delirium in children

## Diagnóstico

Paediatr Anaesth. 2010 Aug;20(8):704-11. doi: 10.1111/j.1460-9592.2010.03328.x.

### **A comparison of emergence delirium scales following general anesthesia in children.**

Baiwa SA<sup>1</sup>, Costi D, Cyna AM.

**CONCLUSIONS:** All three scales correlated reasonably well with each other but have individual limitations in their potential to assess whether ED is present. In the absence of developing an improved research tool to assess ED, a PAED score  $>12$  appears to provide greater sensitivity and specificity than a PAED score  $>$  or  $=10$ . However, the Watcha scale is a simpler tool to use in clinical practice and may have a higher overall sensitivity and specificity than the other scales.





# Emergence delirium in children

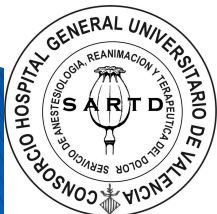
## Prevención

### Dos estrategias

#### ❑ **Enfoque no farmacológico**

**Se han centrado en la disminución de la ansiedad preoperatoria**

- ✓ **Inducción tranquila con una disminución de los estímulos sensoriales**
- ✓ **La musicoterapia**
- ✓ **La distracción**
- ✓ **La hipnosis**
- ✓ **Cintas de vídeo antes de la inducción**
- ✓ **Informar a los padres acerca de los métodos e incentivarlos en distraer a su propio hijo en la sala de espera**



# Emergence delirium in children

## Prevención

### Enfoque farmacológico.

**Varios estudios encontraron que agentes sedantes y analgésicos que dan rutinariamente de forma sistémica o por una vía regional para ser eficaces en la prevención del ED**

**Estos tratamientos preventivos administrados **al final** de la cirugía o por **administración continua** durante la cirugía**



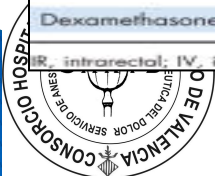
# Emergence delirium in children

## Prevención

Agent	Route and timing of administration	Efficacy	Doses
Midazolam	OR, IV, IR Preoperative	<b>NO</b>	OR: 0.5 mg/kg IV: 0.1 mg/kg IR: 0.5 mg/kg
Midazolam	IV, end of surgery	Yes	IV: 0.1 mg/kg
Hydroxyzine combined to midazolam	OR, preoperative	Yes	1 mg/kg
Propofol	Continuous intraoperative	Yes	Induction 2–3 mg/kg Maintenance: 3–12 mg/kg/h
Propofol	End of surgery	Yes	1 mg/kg
Ketamine	IV, preoperative	Yes	0.25 mg/kg
	IV, end of surgery	Yes	0.25 mg/kg
	OR, preoperative	Yes	6 mg/kg
$\alpha$ 2 Adrenoceptors: clonidine	OR or IR, preoperative	Yes	or 4 $\mu$ g/kg
$\alpha$ 2 Adrenoceptors: clonidine	IV after induction	Yes	2, 3 or 4 $\mu$ g/kg
$\alpha$ 2 Adrenoceptors: Clonidine	CAU	Yes	3 $\mu$ g/kg
$\alpha$ 2 Adrenoceptors: Dexmedetomidine	IV, preoperative	Yes	0.2 $\mu$ g/kg
$\alpha$ 2 Adrenoceptors: Dexmedetomidine	IV, intraoperative	Yes	0.3 $\mu$ g/kg
$\alpha$ 2 Adrenoceptors: Dexmedetomidine	IV, intraoperative	Yes	1 $\mu$ g/kg
$\alpha$ 2 Adrenoceptors: Dexmedetomidine	IV, intraoperative	Yes	0.5 $\mu$ g/kg
$\alpha$ 2 Adrenoceptors: Dexmedetomidine	Caudal	Yes	1 $\mu$ g/kg
Fentanyl	IV, Intraoperative	Yes	2.5 $\mu$ g/kg 1 $\mu$ g/kg
Transcutaneous fentanyl	Preoperative	Yes	10–15 $\mu$ g/kg 100 $\mu$ g
Intranasal fentanyl	Intraoperative after induction	Yes	2 $\mu$ g/kg
Nalbuphine	IV, end of surgery	Yes	0.1 mg/kg
Intraoperative nonopioids analgesia: ketorolac	IV, during surgery	Yes	1 mg/kg
Caudal analgesia	After induction	Yes	1 ml/kg Bupivacaine (0.25%)
Gabapentin	Preoperative	Yes	15 mg/kg
Magnesium infusion	Intraoperative	Yes	30 mg/kg bolus and continuous infusion of 10 mg/kg/h
Dexamethasone	Preoperative	Yes	0.2 mg/kg

IR, intrarectal; IV, intravenous; OR, oral; PACU, postoperative care unit; PONV, postoperative nausea and vomiting. See text for references.

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Valencia 14 de Octubre de 2014



# Emergence delirium in children

## Prevención

Pediatric Anesthesiology

Section Editor: Peter J. Davis

### The Effect of Intraoperative Dexmedetomidine on Postoperative Analgesia and Sedation in Pediatric Patients Undergoing Tonsillectomy and Adenoidectomy

Olutoyin A. Olutoye, MD,\*† Chris D. Glover, MD,\*† John W. Diefenderfer, BS,† Michael McGilberry, RN,† Matthew M. Wyatt, MD,† Deidre R. Larrier, MD,\*‡ Ellen M. Friedman, MD,\*‡ and Mehernoor F. Watcha, MD\*†

**METHODS:** One hundred nine patients were randomized to receive a single intraoperative dose of dexmedetomidine 0.75  $\mu\text{g}/\text{kg}$ , dexmedetomidine 1  $\mu\text{g}/\text{kg}$ , morphine 50  $\mu\text{g}/\text{kg}$ , or morphine 100  $\mu\text{g}/\text{kg}$  over 10 minutes after endotracheal intubation.

**CONCLUSIONS:** The total postoperative rescue opioid requirements were similar in tonsillectomy patients receiving intraoperative dexmedetomidine or morphine. However, the use of dexmedetomidine 1  $\mu\text{g}/\text{kg}$  and morphine 100  $\mu\text{g}/\text{kg}$  had the advantages of an increased time to first analgesic and a reduced need for additional rescue analgesia doses, without increasing discharge times. (Anesth Analg 2010;111:490–5)



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Valencia 14 de Octubre de 2014

# Emergence delirium in children

## Prevención

### Dexmedetomidine Infusion for Analgesia and Prevention of Emergence Agitation in Children with Obstructive Sleep Apnea Syndrome Undergoing Tonsillectomy and Adenoidectomy

Anuradha Patel, MD, FRCA,\* Melissa Davidson, MD,\* Minh C. J. Tran, MD, MPH,\* Huma Quraishi, MD,† Catherine Schoenberg, BSN,\* Manasee Sant, MD,\* Albert Lin, MD,\* and Xiuru Sun, MS\*

**Table 3. Postanesthesia Recovery Unit Data**

	Group F (n = 61)	Group D (n = 61)	P value
OPS maximum (range)	5 (0-10)	3 (0-10)	0.001*
EA score maximum (range)	4 (1-5)	3 (1-5)	0.001*
Duration of severe EA (minutes)	11.85 ± 12.02	6.59 ± 7.42	0.004*
PAED score maximum (range)	14 (0-20)	10 (0-20)	0.051
Rescue by morphine, n (%)	29 (48)	10 (17)	0.0003*
Morphine dosage (mg/kg)	0.073 ± 0.033	0.074 ± 0.033	0.928
SpO <sub>2</sub> below 95%, n (%)	25 (41)	11 (18)	0.01*

OPS, PAED, and EA (Cole scale) are expressed as median values of the maximum score.

Other data are expressed as n (%) and mean ± SD.

Group D = dexmedetomidine group; group F = fentanyl group; OPS = objective pain score; EA = emergence agitation; PAED = pediatric anesthesia emergence delirium.

\* P < 0.05.

**BACKGROUND:** Dexmedetomidine, a specific  $\alpha_2$  agonist, has an analgesic-sparing effect and reduces emergence agitation. We compared an intraoperative dexmedetomidine infusion with bolus fentanyl to reduce perioperative opioid use and decrease emergence agitation in children with obstructive sleep apnea syndrome undergoing adenotonsillectomy (T&A).

**METHODS:** One hundred twenty-two patients with obstructive sleep apnea syndrome undergoing T&A, ages 2 to 10 years, completed this prospective, randomized, U.S. Food and Drug Administration–approved study. After mask induction with sevoflurane, group D received IV dexmedetomidine  $2 \mu\text{g} \cdot \text{kg}^{-1}$  over 10 minutes, followed by  $0.7 \mu\text{g} \cdot \text{kg}^{-1} \cdot \text{h}^{-1}$ , and group F received IV fentanyl bolus  $1 \mu\text{g} \cdot \text{kg}^{-1}$ . Anesthesia was maintained with sevoflurane, oxygen, and nitrous oxide. Fentanyl  $0.5$  to  $1 \mu\text{g} \cdot \text{kg}^{-1}$  was given to subjects in both groups for an increase in heart rate or systolic blood pressure 30% above preincision values that continued for 5 minutes. Observers in the postanesthesia care unit (PACU) were blinded to treatment groups. Pain was evaluated using the objective pain score in the PACU on arrival, at 5 minutes, at 15 minutes, then every 15 minutes for 120 minutes. Emergence agitation was evaluated at the same intervals by 2 scales: the Pediatric Anesthesia Emergence Delirium scale and a 5-point scale described by Cole. Morphine ( $0.05$  to  $0.1 \text{ mg} \cdot \text{kg}^{-1}$ ) was given for pain (score >4) or severe agitation (score 4 or 5) lasting more than 5 minutes.

**RESULTS:** In group D, 9.8% patients needed intraoperative rescue fentanyl in comparison with 36% in group F ( $P = 0.001$ ). Mean systolic blood pressure and heart rate were significantly lower in group D ( $P < 0.05$ ). Minimum alveolar concentration pain values were significantly different between the 2 groups ( $P = 0.015$ ). The median objective pain score was 3 for group D and 5 for group F ( $P = 0.001$ ). In group D, 10 (16.3%) patients required rescue morphine, in comparison with 29 (47.5%) in group F ( $P = 0.002$ ). The frequency of severe emergence agitation on arrival in the PACU was 18% in group D and 45.9% in group F ( $P = 0.004$ ); at 5 minutes and at 15 minutes, it was lower in group D ( $P = 0.028$ ). The duration of agitation on the Cole scale was statistically lower in group D ( $P = 0.004$ ). In group D, 18% of patients and 40.9% in group F had an episode of SpO<sub>2</sub> below 95% ( $P = 0.01$ ).

**CONCLUSIONS:** An intraoperative infusion of dexmedetomidine combined with inhalation anesthetics provided satisfactory intraoperative conditions for T&A without adverse hemodynamic effects. Postoperative opioid requirements were significantly reduced, and the incidence and duration of severe emergence agitation was lower with fewer patients having desaturation episodes. (Anesth Analg 2010;111:1004–10)



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Valencia 14 de Octubre de 2014

# Emergence delirium in children

## Prevención

Anesthesiology 2007; 107:733-8

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### *A Single Dose of Propofol at the End of Surgery for the Prevention of Emergence Agitation in Children Undergoing Strabismus Surgery during Sevoflurane Anesthesia*

Marie T. Aouad, M.D.,\* Vanda G. Yazbeck-Karam, M.D.,† Viviane G. Nasr, M.D.,‡ Mohamad F. El-Khatib, Ph.D.,\* Ghassan E. Kanazi, M.D.,\* Jamal H. Bleik, M.D.§

**Background:** Emergence agitation in children after sevoflurane is common. Different drugs have been used to decrease its occurrence with variable efficacy. The authors compared the incidence and severity of emergence agitation in children who received a single dose of propofol at the end of strabismus surgery *versus* children who received saline.

**Methods:** In this prospective, randomized, double-blind study, the authors enrolled 80 healthy children aged 2–6 yr. The children were randomly allocated to the propofol group ( $n = 41$ ), which received 1 mg/kg propofol at the end of surgery, or to the saline group ( $n = 39$ ), which received saline.

**Results:** The mean scores on the Pediatric Anesthesia Emergence Delirium scale were significantly lower in the propofol group compared with the saline group ( $8.6 \pm 3.9$  vs.  $11.5 \pm 4.5$ ;  $P = 0.004$ ). Also, the incidence of agitation was significantly lower in the propofol group compared with the saline group ( $19.5\%$  vs.  $47.2\%$ ;  $P = 0.01$ ). A threshold score greater than 10 on the Pediatric Anesthesia Emergence Delirium scale was the best discriminator between presence and absence of emergence agitation. Times to removal of the laryngeal mask airway ( $10.6 \pm 1.5$  vs.  $9.4 \pm 1.9$  min;  $P = 0.004$ ) and emergence times ( $23.4 \pm 5.7$  vs.  $19.7 \pm 5$  min;  $P = 0.004$ ) were significantly longer in the propofol group. However, discharge times were similar between the two groups (propofol:  $34.1 \pm 8.4$  min; saline:  $34.9 \pm 8.6$  min). More parents in the propofol group were satisfied.

**Conclusions:** In children undergoing strabismus surgery, 1 mg/kg propofol at the end of surgery after discontinuation of sevoflurane decreases the incidence of agitation and improves parents' satisfaction without delaying discharge from the post-anesthesia care unit.

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Valencia 14 de Octubre de 2014



# Emergence delirium in children

## Tratamiento

**El tratamiento debe iniciarse cuando estemos ante un niño con una agitación intensa asociada con riesgos de autolesionarse**

**Calmar al paciente si no hay riesgo de autolesión y la agitación es menos intensa.**

**El tratamiento se basa en la administración de agentes sedantes intravenosos (**Midazolam 0,1 mg/kg o Propofol 0,5-1 mg/kg**) o agentes opioides (**Fentanil 1-2mcg/kg**).**



# Emergence delirium in children

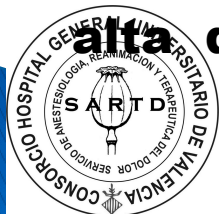
## Conclusión

Es una complicación frecuente en los niños en **edad preescolar anestesiados**, especialmente cuando se utiliza **sevoflurano**.

Las estrategias de prevención se basan en la **prevención de la ansiedad preoperatoria, el tratamiento del dolor postoperatorio y la administración** de propofol al final de la cirugía, la dexmedetomidina intraoperatoria y dexametasona.

Cuando ocurre, se debe informar a los padres sobre los posibles **comportamientos desadaptativos postoperatorios en las semanas o meses después de la cirugía.**

Finalmente, todas estas estrategias han demostrado retrasar el **alta** de la unidad de recuperación postquirúrgica.





# Emergence delirium in children

## 1. IDENTIFICACION DE FACTORES DE RIESGO

### FACTORES DE RIESGO

Frecuente en niños preescolares

Anestésico inhalatorio de rápida acción.  
Sevorane/Desflorane

Sexo masculino

Rápido despertar de la anestesia

Procedimientos quirúrgicos  
otorrinolaringológicos

Ansiedad preoperatoria

Temperamento del niño

## 2. PREVENCIÓN

### NO FARMACOLÓGICA

Inducción tranquila

Métodos de distracción infantil  
(payasos, música, vídeos...)

Informar a los padres

### FARMACOLÓGICA

Midazolam al final de la cirugía 0.1 mg/kg IV

Propofol al final de la cirugía 1 mg/kg ó pciv intraoperatorio

Dexametasona 0.2mg/kg iv (preoperatorio)

Dexmedetomidina intraoperatorio 0.3-1.0mcg/kg

Técnicas de anestesia neuroaxial ó anestesia regional

## 3. DIAGNÓSTICO

PAED scale >ó igual a 10

Watcha scale score 3 ó 4

Table 1: Pediatric Anesthesia Emergence Delirium (PAED) scales

Point	Description of Items	Scoring				
		not at all	just a little	quite a bit	very much	extremely
1	The child makes eye contact with the caregiver	4	3	2	1	0
2	The child's actions are purposeful	4	3	2	1	0
3	The child is aware of his/her surroundings	4	3	2	1	0
4	The child is restless	0	1	2	3	4
5	The child is inconsolable	0	1	2	3	4

Table 3 Watcha scale. Score is observed values

Behaviour	Score
Asleep	0
Calm	1
Crying, but can be consoled	2
Crying, but cannot be consoled	3
Agitated and thrashing around	4

## 4. TRATAMIENTO

**Midazolam 0.1mg/kg**

**Propofol 0.5-1mg/kg**

**Fentanilo 1-2mcg/kg**

e Formación Continuada  
e Octubre de 2014





**SARTD-CHGUV Sesión de Formación Continuada  
Valencia 14 de Octubre de 2014**

**GRACIAS**

