THE IMPORTANCE OF PRELIMINARY ANESTHESIA UNDER GENERAL ANESTHESIA FOR ENT SURGERY IN CHILDREN

D Dumbravă[1], GhI Comşa[2]

Abstract

This study analyzes the importance of preliminary anesthesia under general anesthesia for ENT surgery in children, due to the high frequency of this kind of medical procedures in children and the particulary special psychological impact on child and family.

Key words: general anesthesia, medical procedures, ENT, children, Richmond scale, agitation.

Introduction

Most of the times, the ENT medical procedures in children are electrive procedures, often representing the first surgical experience in a child's life. In the U.S., for example, 250 000 (*two hundred and fifty thousand*) tonsillectomies (1) are performed annually. Therefore, the psyichological impact on children and their families is major. The causes of anxiety in pediatric patients are multifactorial, and most often due to the patient's inability to communicate effectively, to the existence of a hostile environment for children and the poor, distorted informing of parents. To limit the negative effects of anxiety on children, but also on their families, pacient's premedication is used. There are a number of ways this procedure can be done, without asking the parents to withdraw: orally; rectally; sublinguall; Injected, either intramuscular or intravenous.

Recent studies on the importance of pre-operative sedation(or preliminary anesthesia) show that pre- and postoperative agitation causes negative effects on patient, such as : disorders of ventilatory control, increased oxygen consumption, accidental removal of the probes and catheters or, especially in ENT surgery, increased risk of postoperative wound bleeding (2).

Material and Methods

After obtaining written informed consent of parents, we performed a prospective study in the ENT clinic of County Emergency Hospital Constanta over 249 patients, ASA I-III, aged 3 to 14 years old, hospitalized for scheduled or emergency interventions, which were divided in two large groups: those who received intravenous anesthesia and those who recieved inhalational anesthesia with sevoflurane. In both groups there were patients who received preliminary anesthesia and patients who did not. For induction of anesthesia are used: *sevoflurane administered* through a face *mask in group A, until the patient* enter the 3rd phase of anesthesia, venous line placement, administration of atropine 0.2 mg / kg, fentanyl 3 µg/ kg and then rocuronium 0.3 mg / kg. After the orotracheal intubation, maintaining has been done with Sevoflurane 2,5% and Oxygen 2 l/min. Awakening from anesthesia was spontaneous, without antagonisation, in all patients. In group B, after the venous line placement, same anesthetic technique was used, except that, instead of utilizing sevoflurane, a dose of 2.5 mg/kg IV propofol was given. Maintaining was done by reinjection of propofol and fentanyl boluses, awakening being also spontaneous. The rectal route of administration (ROA) was used in all patients who received pre-anesthetic medication, consisting of a dose of 0.2 mg/kg diazepam Desitin administered about 30 minutes before surgery. Exclusion criteria were known allergies to any anaesthetic agent, family history of malignant hyperthermia, coagulopaty and the legal guardian's refusal to sign consent.

The data obtained were statistically processed in MS Excel 2010 observing the following aspects: the age distribution of patients, the types of general anesthesia used in surgery, their length, as well as the influence of pre-anesthetic medication regarding the degree of early postoperative agitation and sedation.

Results and discussions

The collected data show a relatively uniform distribution over the range studied, presented in the following Table No. 1 and Fig. No. 1, with a maximum of 137 patients who received inhalational anesthesia.

In terms of type of general anesthesia used, distribution was clearly in favor of inhalational anesthesia (90 cases - 69.77%) in the age group 3-7 years, followed by intravenous anesthesia (39 cases - 30.23%); we noted in the age group 8-14 years, a high percentage of intravenous anesthesia (73 cases- 60.83%) compared to inhalational anesthesia (47 cases-39.17%). In Table No. 2 and Figure No. 2 we present the distribution by year and type of anesthesia, in the study group.

[1]County Emergency Hospital Constana, ph.D student at Ovidius University Constanta
[2]County Emergency Hospital Constana, ENT Clinic.
E-mail: ddumb2006@yahoo.com, geocomsa@yahoo.com

Table No.1 – Distribution of patients in the study group according to the general anesthesia types.

The type of anesthesia	No. of patients	Percent (%)
inhalational	137	55.02
i.v.	112	44.98

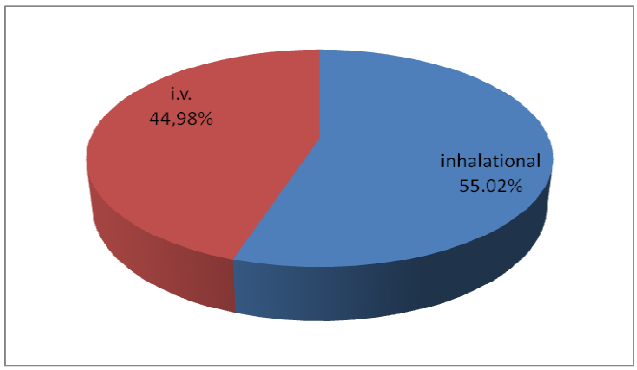

Fig. No. 1- Distribution by types of general anesthesia used.

Table No. 2-Distribution of patients by age and type of general anesthesia.

Age	2011	inhalational	percent(%)	iv	percent (%)
3-7 years	129	90	69.77	39	30.23
8-14 years	120	47	39.17	73	60.83

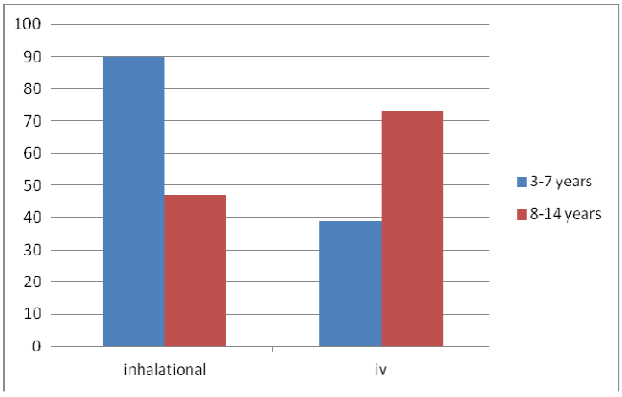

Fig. No. 2 - Distribution of patients by age and type of general anesthesia.

From the two main group: A (inhalational anesthesia) and B (IV anesthesia) , two quasiequal subgroups were selected consisting of a number of 68 patients who received pre-medication and 69 patients who have not in group A, and 57 vs. 55 in group B. The 249 patients in this study are pediatric patients with various pathologies, aged 3 to 14 years, who underwent surgery in the ENT Clinic of County Emergency Hospital Constanta in the first 8 month of 2011. The data are represented in Table No.3 and Figure No. 3.

Table No. 3-The distribution of patients according to the type of anesthesia and pre-anesthesia given.

	Group A	Percent (%)	Group B	Percent (%)
Pre-medication	68	49.64	57	50.89
Without pre-medication	69	50.36	55	49.11

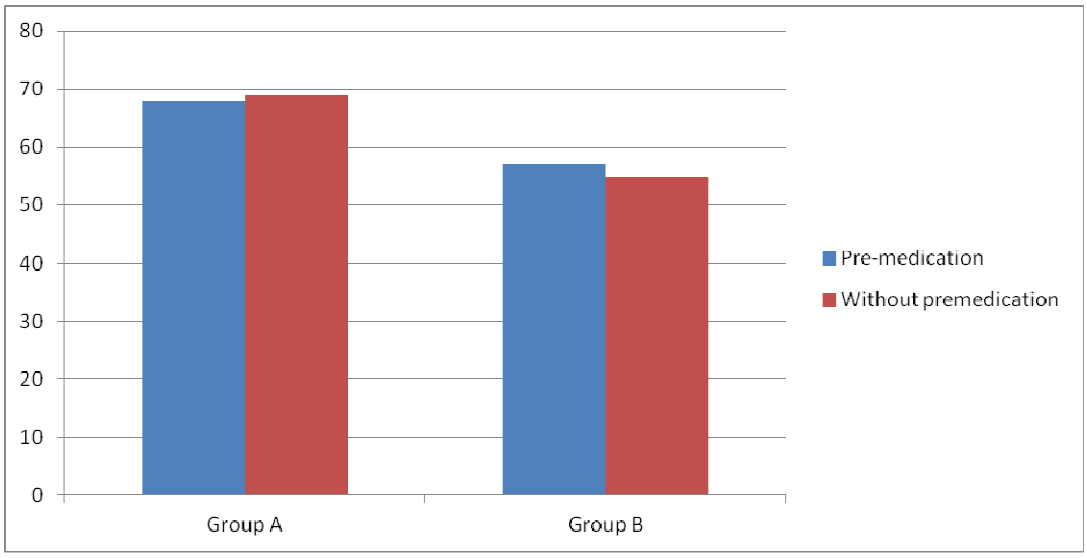

Fig. No. 3- The distribution of patients according to the type of anesthesia and pre-anesthesia given.

Medical studies reveal a number of scales evaluating the grade of sedation and agitation, such as: Riker scale, motor assessment scale, Ramsay scale and Richmond scale. To evaluate the selected patients in our study, we used the Richmond scale (3):

+4 – Combative; Combative, violent, danger to staff;
+3 - Pulls or removes tube(s) or catheters; aggressive;
+2 - Frequent nonpurposeful movement, fights ventilator;
+1 - Anxious, apprehensive , but not aggressive;
0 - Alert and calm
-1 - awakens to voi ce (eye opening/contact) >10 sec;
-2 - light sedation, briefly awakens to voice (eye opening/contact) <10 sec;
-3 - moderate sedation, movement or eye opening. No eye contact;
-4 - deep sedation, no response to voice, but movement or eye opening to physical stimulation;
-5 - Unarousable, no response to voice or physical stimulation.

The data obtained and presented in Table 4 and Figure 4 reveal an increased frequency of high-grade agitation in group aged 3 to7 years (10.08% - 4th grade, 14.73% - 3rd grade 20.16%-2nd grade) compared with group aged 8 to 14 years, where we noticed that with increasing age, the percentages are significantly reduced (4.48% - 4th grade, aged 8 to 10 and 1.49%,aged 11 to 14 , 7.46% - 3rd grade, aged 8 to 10 and 4.48% aged 11 to 14 , and , finally, 11.94% - 2nd grade, aged 8 to 10 and 7.46%, aged 11-14).

Table No. 4 – Agitation assessment based on Richmond scale, divided by age group.

Richmond Scale	3-7 years	%	8-10 years	%	11-14 years	%
4	13	10.08	3	4.48	1	1.49
3	19	14.73	5	7.46	3	4.48
2	26	20.16	8	11.94	5	7.46
1	31	24.03	22	32.84	19	28.36
0	4	3.10	8	11.94	8	11.94
-1	11	8.53	7	10.45	9	13.43
-2	13	10.08	6	8.96	5	7.46
-3	8	6.20	6	8.96	2	2.99
-4	4	3.10	2	2.99	1	1.49
-5	0	0.00	0	0.00	0	0.00
Total	129		67		53	

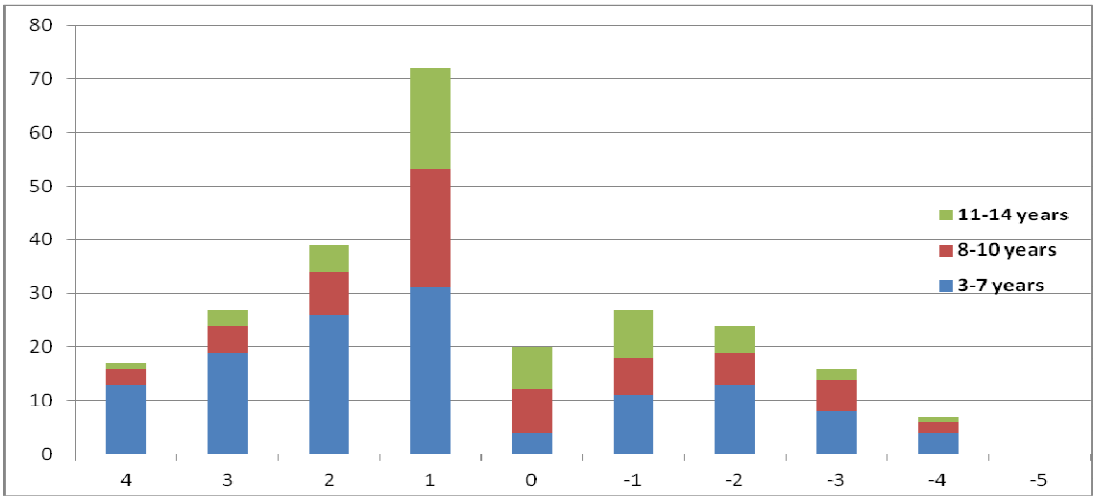

Fig. No. 4 – The distribution of patients according to age group and the stage of agitation.

In Table No. 5 we present the statistics results of the two large groups A and B, as well as the results of the subgroups, ranking sedated and unsedated patients. In the group aged 3 to 7, by comparing patients who underwent sedation and those who have not (1.47% vs. 4.35% - 4th grade and 7.35% vs. 14.49% - 3rd grade), we noticed a clear difference in the percentage of patients ranked in dangerous agitation groups (4th and 3rd). In the group aged 8 to 14 there is a difference, but a significantly lower one, between the two subgroups (1.75% vs. 1.82% - 4th grade and 5.26% vs. 7.27% - 3rd grade). Analysis of statistics results shows a major variation in the proportion of patients classified in groups +1, 0, -1 , between the group of patients aged 3 to 7 and the second one aged 8 to 14 (25% vs. 24.56% - 1st grade , 7.35% vs. 15.79% - 0 grade and 10.29% vs. 19.39% - grade -1). This difference can be explained primarily by specific psychological changes that occur at different ages.

Table No. 5 – distribution of patients depending on age and premedication.

Richmond Scale	Group A Premedicated	%	Lot A un-premedicated	%	Lot B premedicated	%	Lot B un-premedicated	%
4	1	1.47	3	4.35	1	1.75	1	1.82
3	5	7.35	10	14.49	3	5.26	4	7.27
2	10	14.71	13	18.84	5	8.77	8	14.55
1	17	25.00	15	21.74	14	24.56	12	21.82
0	5	7.35	2	2.90	9	15.79	7	12.73
-1	7	10.29	6	8.70	11	19.30	10	18.18
-2	13	19.12	12	17.39	8	14.04	6	10.91
-3	8	11.76	7	10.14	5	8.77	6	10.91
-4	2	2.94	1	1.45	1	1.75	1	1.82
-5	0	0.00	0	0.00	0	0.00	0	0.00
TOTAL	68		69		57		55	

Conclusions

1. The degree of postoperative agitation is significantly influenced by the child's age and socio-cultural background;
2. The preoperative sedation gives a much more stronger sense of comfort to both child and parents';
3. In our study, at group aged 3 to 7 , there was a clear difference regarding the reduction of postoperative agitation in patients who recived premedication, compared to the ones who have not , noting that in the patients group aged 8 to 14, this difference significantly diminishes.

References

1. Shinhar S, Scotch BM, Belenky W, Madgy D, Haupert M. Harmonic scalpel tonsillectomy versus hot electrocautery and cold dissection: an objective comparison. Ear Nose Throat J. 2004;83(10):712-715.
2. Fraser GL, Riker RR, Prato BS, et al. The frequency and cost of patient-imitiated device removal in the ICU. Pharmacotherapy 2001;21:1-6.
3. De Jonghe B, Cook D, Appere-De-Vecchi C, et al. Using and understanding sedation scoring systems: A systematic review. Intensive Care Med 2000;26:275-285.
4. Zdrehuş C. Recomandări pentru sedare şi analgezie la pacientul critic. În recomandări şi protocoale în anestezie, terapie intensivă şi medicină de urgenţă 2009.

Correspondance to:

Dumbravă Daniel
145, Tomis Bvd.
Constanţa,
Romania,
Phone: +4 0745 777816
E-mail: ddumb2006@yahoo.com