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Survey on the practice of ambulatory anesthesia in Algerian children.

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Abstract

Background: This survey aims to describe current practice in ambulatory care among pediatric anesthesiologists in Algerian hospitals.

Methods: Anesthesiologists of 40 hospital institution were received a questionnaire examining the proportion of pediatric ambulatory anesthesia practiced by each responder.

Results: At the end of the survey, 42.5% (17/40) of the country's hospitals answered the questionnaire, including 4 in the center of the country, 6 in the west of Algeria, 4 in the east and 3 in the south of the country. The entire investigation took place in the public sector. The institutional distribution was as follows: UHC (8 / 17-47%), HPI (6-35%) and SHI (3-18%). The 17 questionnaires were complete. All the practitioners who responded had ambulatory anesthesia activity. The part of the ambulatory in the surgical activity is practically identical in the different regions of the country including the capital 'Algiers'.

Conclusion: A better commitment for ambulatory care must be found among anesthesiologists. Further studies are required to acquire more details on the practice of ambulatory anesthesia of all hospital institution in Algeria.

Keywords: Children, Pediatric anesthesia, Ambulatory, Surgerical procedures, Survey.

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Introduction

The benefits of ambulatory anesthesia are now accepted by all actors, in addition to the economic benefits, the shortening of the separation time of the child from his parents and thus decrease of the perioperative anxiety. The main objective of any outpatient unit is to provide high quality and high security care, and to maximize the parents' satisfaction and the comfort of the child. The success of outpatient care depends on the ability of organizations to anticipate and prevent events that may compromise their management by unplanned hospitalization, re-hospitalization or dissatisfaction. Pain and postoperative nausea and vomiting are responsible for a majority of these outpatient management failures.

Children are good candidates for outpatient anesthesia, because they are usually healthy with a reduced pathological history, benefiting from simple surgeries with few complications and a short recovery time [1,2]. The originality of pediatric outpatient anesthesia is the involvement of parents in caring of their children. At the national level, we have not yet found any published document dealing with the organization of pediatric ambulatory anesthesia.

In Algeria, no specific regulatory measure or recommendation for the practice of ambulatory anesthesia in children currently exists. Thus, it seems desirable to evaluate the current Algerian practice of pediatric outpatient anesthesia.

The aim of this study is to make an inventory of the practice of ambulatory anesthesia in children in different regions of the country, to describe the organization of structures, the typology of patients and anesthetic management. And detailed perioperative patients scheduled for a selection of acts.

Materials and Methods

Population

A prospective cross-sectional study was conducted among all the anesthesiologists practising in different regions of Algeria, we initiated a national survey on a two-month capture period (April and May 2015), to to make an inventory of the practice of ambulatory anesthesia in children in different Algerian establishments.

Questionnaire

We sent a questionnaire to the intensive care anesthetist doctors practising pediatric anesthesia in 40 public hospitals. The link was e-mail, telephone or an interview during a site visit. Anesthesiologists, who did not respond, were restarted by e-mail or phone call back each week.

The questionnaire consisted of 20 questions divided into four groups (Annexure):

• The first focused on demographics.

• The second on the organization.

• The third on the organization of the day of ambulatory anesthesia.

• The fourth group was interested in organizing the post-anesthetic period.

The questionnaire is presented in the appendix.

Statistical Analysis

The answers were collected on a computer data entry mask specially designed for the SPSS 20 survey.

Results

At the end of the survey, 42.5% (17/40) of the country's hospitals answered the questionnaire, including 4 in the center of the country, 6 in the west of Algeria, 4 in the east and 3 in the south of the country (Figure 1). Anesthesiologists from 23 hospitals did not respond to the questionnaire. In each establishment, we have 4 to 5 anesthesiologists.

Demographic Characteristics of the Sample

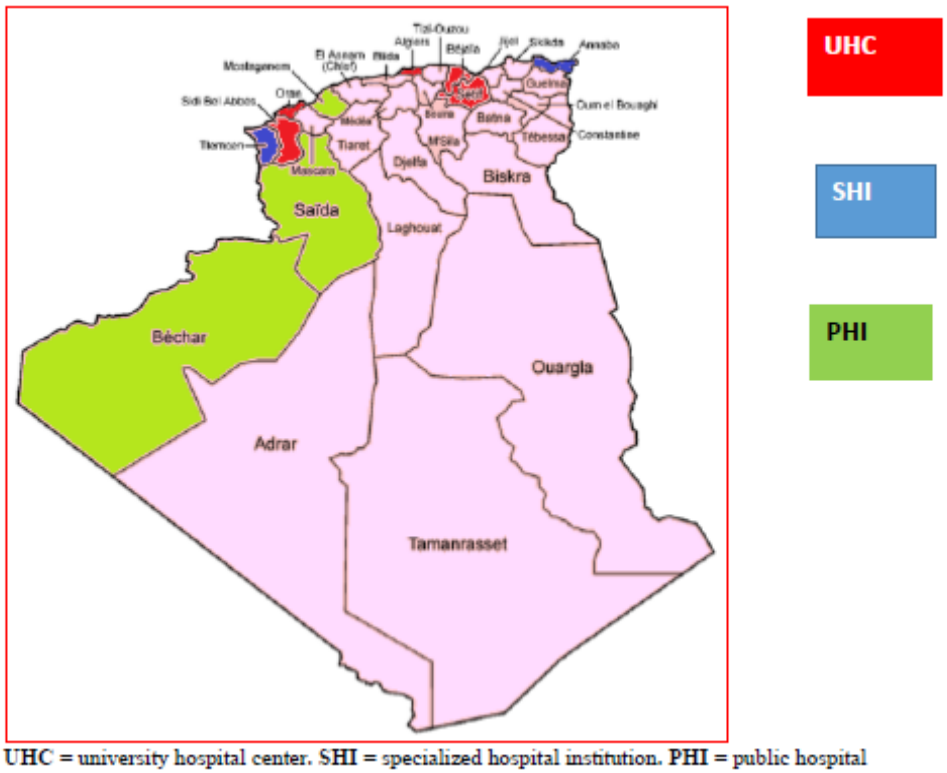
The age of the intensive care anesthetists who participated in the survey ranged from 35 to 45 years, with a 68% male population. The entire investigation took place in the public sector. The institutional distribution was as follows: UHC (University Hospital Center) (8/17-47%), HPI (Hospital Public Institution) (6-35%) and SHI (Specialised Hospital Institution) (3-18%). The 17 questionnaires were complete. All the practitioners who responded had ambulatory anesthesia activity. The part of the ambulatory in the surgical activity is practically identical in the different regions of the country including the capital 'Algiers'.

Overall Rate of Outpatient Activity

The national rate of outpatient practice in children was 48%. The ambulatory rate varied by facility from 20 to 70% (Table 1).

Organization in the Operating Room

Interventions were performed in an operating theater reserved to outpatient surgery in 6% (1/17) of the cases



UHC = university hospital center. **SHI** = specialized hospital institution. **PHI** = public hospital institution

Figure 1. *Geographical distribution of participating institutions*

at the Pediatric Surgery Department of Oran UHC in the west of the country. While in the majority of cases 94% (16/17), interventions were performed in a traditional operating theater. We noted that pediatric activity in the operating room was shared with the adult in a central block in 53% (9/17) of the cases especially at the level of mother-child PHI and SHI.

Hospitalization

Patients who underwent ambulatory surgery were hospitalized in a conventional hospital ward in all cases. There is no secretariat in place dedicated to the ambulatory.

Selection Criteria

Criteria related to the patient

The lower age limit: 11.8% (2/17) of Anesthesiologists managed outpatients aged less than 6 months, in 58.8% (10/17) of Anesthesiologists, the age limit inferior to outpatient management was more than 6 months, and in 29.4% (5/17) cases, the limit age plus 3 years was especially in the PHI (Figure 2).

The ASA class: 53% (9/17) of the anesthesiologists interviewed performed outpatient anesthesia in patients classified ASA 1, 35.3% (6/17) performed it in children classified ASA (American Society of Anesthesiologie) 1 and 2 and only 11, 7% (2/17) did so even in children classified as ASA 3 (Figure 3).

Distance between home and hospital: 58.8% (10/17) of institutions limit distance for outpatient care within 20 km from home to hospital, 23.5% (4/17) of them limit it between 20 and 50 Km and 17.6% (3/17) limit it to more than 50 Km.

List of Surgical Procedures

The list of surgical interventions studied is as follows:

Urogenital: phimosis cure, circumcision, testicular ectopia cure, inguinal hernia repair, hydrocele cure.

Visceral: cure of herniation of the white line.

Orthopedics: spindle removal, foreign body ablation, biopsy, plasters.

The quasi-performed outpatient gestures were dressing changes, plasters, circumcisions, and hydrocele treatment.

Table 1. *Outpatient rate reported by some Algerian institutions*

Institution	Number	Percentage
UHC Mustapha Bacha Algiers	450	
UHC Beni-Messous Algiers	>800	50
UHC Oran	500	52
MH Algiers		20
PHI El Biar Algiers		70
SHI mother-childrenTlemcen	300	
SHI mother-children Annaba	>1000	
MH: Military Hospital		

Anesthetic Techniques

All types of anesthesia were used, 11 (68.7%) of MAR, performed pediatric surgery under regional anesthesia (RA) and 5 (32.3%) performed under general anesthesia (GA).

Organization of the Outpatient Activity

The organization of the outpatient activity at the level of the pediatric surgery series was done according to two methods:

By vacation

The majority of hospitals 64.7% (11/17) opted to take fixed days for ambulatory activity. Of which 4/11 preferred to take a day at the end of the week (Thursday) to avoid leaving patients hospitalized for the weekend. This programming mode is chosen according to the operating days of the surgeons.

Every day

35.3% (6/17) of the establishments have an outpatient activity every day of the week.

Exit Protocol

There was a written discharge protocol in only 11.8% of cases (2 institutions), this protocol had been performed by the anesthesiologists. This protocol was delivered during the preoperative anesthesia consultation in 100% of cases.

Follow-Up Organisation

The postoperative follow-up protocol was implemented in

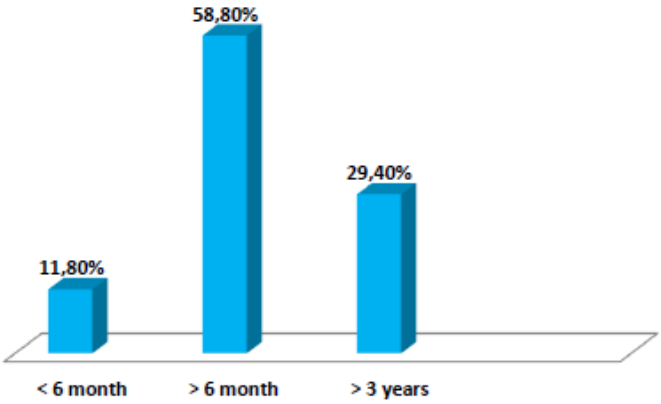


Figure 2. *Patient age limits*

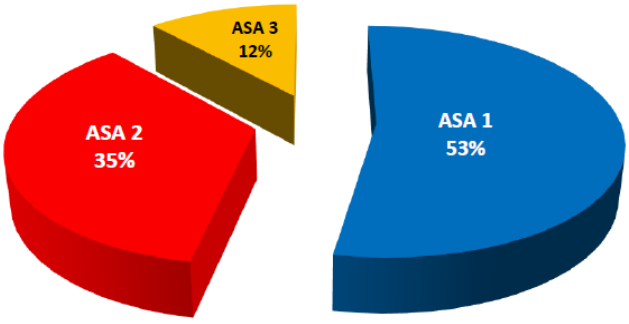


Figure 3. *Patient ASA class*

13% of cases, and was performed by the anesthesiologist in 50% of the cases.

Discussion

For a decade now, the interest in outpatient anesthesia in children has grown. Nevertheless, the number of studies interested in it remains relatively modest and most often concerns the medical aspect of this practice. We wish through this survey to make the current point of the development of the practice outpatient pediatric surgery in Algeria.

We count the response rate at 42.5%. We relate the causes of non-response to the period of the survey which was limited (2 months) and the non-availability of anesthesiologists.

The first striking observation, concerning the share of ambulatory activity in the global anesthetic activity, was 48% higher than any type of public establishment combined. The survey was not conducted at the level of private institutions, knowing that in Algeria, the majority of activities in the liberal sector are in the outpatient setting. The ambulatory rate did not correlate with the type of facility (UHC, PHI or SHI). Most of the acts performed were performed in non-dedicated operating theaters [3].

Macq et al. [4] show in results of a national series on pediatric anesthesia in France in 2010, that the overall rate of outpatient anesthesia is 60.4% of the 921,000 pediatric anesthetic acts in France, all anesthesia and all institution combined, however, the rate of ambulatory anesthesia in hospitals in France is 32.2%. Rabitts et al. [5] shows that in the United States, the overall rate nationally in 2006 is 82%, all acts combined and all types of public and private institutions.

Our survey shows that outpatient practice is performed in all hospitals. The outpatient rate was close to that of the United Kingdom and Sweden (Figure 4). It appeared that the results concerning gestures performed on an outpatient basis, particularly urogenital, were broadly consistent with the practice of other outpatient units. Indeed, in Turkey, Beyaz et al. [6] found a rate of 81.8%, because the surgical procedures included in the study were exclusively mesocolic for the realization and evaluation of the caudal block. In the West Indies, at the University Hospital of the West Indies, ambulatory anesthesia has been practised for 40 years.

What Eligibility Criteria for Ambulatory Anesthesia?

Surgical indications

Among the acts performed on an outpatient basis in children, the three main surgeries involved in absolute numbers are urogenital surgery, visceral surgery and orthopedic surgery. Meanwhile, the 5 most performed acts were: testicular ectopia cure, circumcisions, hydrocele cure, dressing changes and plasters. On the other hand, analysis of the proportion of outpatient procedures for each type of surgery shows that urological and visceral surgeries are mainly performed in outpatient hospitalization. Orthopedic surgery and plastic surgery have a lower percentage of ambulatory procedures.

Of the 975 surgical procedures, Scarlett et al. [7] performed 62.4% urogenital surgery (inguinal hernia: 43.2%, circumcision: 13.3% and orchidopexy: 5.9%). In Tunisia, Khalifa [8] found a rate of 76.8% of urogenital surgery. In the United Kingdom, in the Calder [9] study, urogenital surgery accounted for 69.9% of all procedures. In France, Donzeau et al. [10] describe a 31.3% rate of urogenital surgery combined with visceral surgery. Regarding the organization, while we observed that the majority 93.3% of the establishments practised the ambulatory in a non-dedicated block and niche slots non-commercial.

We note a strong agreement between the anesthesiologists regarding the type of outpatient surgical procedures except for a few acts related to the UHC. In Turkey, Beyaz et al.

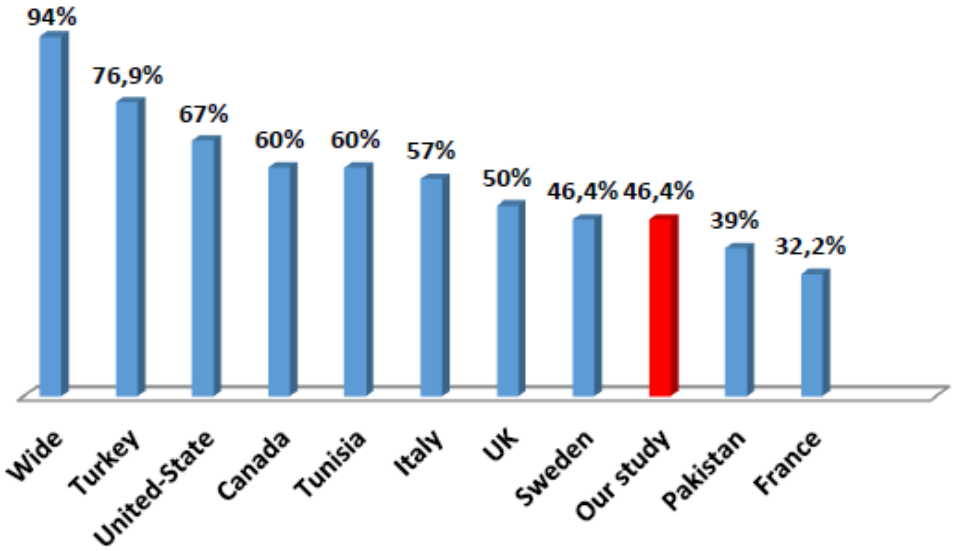


Figure 4. *Percentage of ambulatory care: International comparison*

[6] found a rate of 81.8%, because the surgical procedures included in the study, the acts were exclusively mesocolic for the realization and evaluation of the caudal block. In the West Indies, at the University Hospital of the West Indies, ambulatory anesthesia has been practised for 40 years. Of the 975 surgical procedures, Scarlett et al. [7] performed 62.4% urogenital surgery (inguinal hernia: 43.2%, circumcision: 13.3% and orchidopexy: 5.9%). In Tunisia, Khalifa [8] found a rate of 76.8% of urogenital surgery. In the United Kingdom, in the Calder study [9], urogenital surgery accounts for 69.9% of all acts in France, Donzeau et al. [10] describe a 31.3% rate of urogenital surgery combined with visceral surgery.

Our result concerning visceral surgery is similar to that of the Pakistan study. Mandhan et al. [11] conducted a prospective study in Karachi, over a three-year period (1994-1996), 368 surgical procedures were performed, of which 17 (4.7%) were visceral surgery. represented mainly by the umbilical hernia cure. On the other hand, our result is different from that found in other studies ranging from 1% to 45.6% [7,9,12-14].

The consultation between the anesthetist and the surgeon is an extremely important point. It should be noted that the choice of interventions that can be performed on an outpatient basis was the result of consultation in the majority of cases.

From these comparisons, we note a heterogeneous practice with large variations between different surgical centers. The list of outpatient surgical procedures is non-exhaustive and non-exhaustive, allowing for a change in the nature of the acts practised in the setting of a context and a well-defined organization at the level of each team.

Criteria for Selecting Children

The age

Ambulatory anesthesia is usually reserved for children older than 6 months due to the risk of sudden infant death advanced by some. But in the absence of a proven link between anesthesia and sudden infant death, the age of children selected for outpatient anesthesia was reduced by some teams (13.3%) to less than six months. What is comparable to the practices? However, our survey shows that the lower age limit is related to the type of hospital. The pediatric outpatient activity mainly concerns children over 3 years old in hospitals far from the hospital. This is comparable to the French survey [4].

However, Macq et al. [4] have recently shown that pediatric outpatient activity mainly concerns children over 1 year of age (98% among those over 1 year of age and 64% among those over 3 years of age). In France, the same age limit of more than six months was used by 49% of French anesthesia doctors during a survey conducted by ADARPEF in November 2009 [15]. This survey reveals a real consensus that a child less than six months old should be excluded from outpatient anesthesia. Also in France, Rod et al. [16] in its survey of the urological surgery activity conducted during the years 2011 and 2012, show that the majority of centers (55%) set their limit at six months. But 30% of them express the desire to go down to three months. One-third of study centers lowered their age limit to less than six months. In a national survey in the United States, Castro shows that ambulatory anesthesia is used in children aged from 3 months in the majority of cases [17].

ASA class

The benefit/risk ratio of outpatient hospitalization was assessed for patients with specific conditions.

In our survey, the anesthesiologists interviewed performed outpatient anesthesia in ASA 1, ASA 2 and ASA 3 stabilized patients. These results were comparable to those of Grenier et al. [18]. Similar results were reported in the Canadian study at the Ontario Children's Hospital (CHEO), over a five year period from 1992 to 1997, an average of 4899 patients per year were ranked ASA 1, ASA 2 and ASA 3 balanced [19]. In a French study, on a series of 935 patients hospitalized in the Montpelier University Hospital for performing surgical or endoscopic surgery, Kalfa et al. [13] excluded children classified as ASA 3 or 4. In the West Indies, children classified as ASA 1 were excluded from ambulatory care [20].

The distance from home to the hospital

The selection of children is also done by the selection of parents and their environment. The majority of anesthesiologists surveyed agree to perform ambulatory anesthesia in children living within a radius of less than 20 km from the hospital. Most authors prefer to limit the distance between the patient's residential home and the post-operative care structure. In Niger, Abdu-Rahmane et al. [21] excluded all children residing within a radius of more than 20 km; this is probably due to geographical difficulties to access the hospital in case of complications. In Malaysia, Lim et al. [14] excluded from his study any patient residing more than 20 km from Kuala Lumpur. This is due to the increased number of hospitals. Other authors have increased the distance, particularly in France, Kalfa et al. [13] it was 50 km from the hospital, because they wanted to evaluate the feasibility of ambulatory anesthesia in infants. Still in France, Moncel et al. [22] had increased the distance to 150 km.

Through our study, we have been able to show that the distance of removal is not a most important criterion to consider when assessing the eligibility of the patient. In accordance with the recommendations of the SFAR (2009), this considers that the duration and the distance of distance of the structure are not factors of exclusion [23].

Anesthetic management

The development of RA in pediatrics, as well as its recognized effectiveness, makes this analgesia technique a fundamental tool in the analgesic management. The

RA was performed by 68.7% of the anesthesiologists interviewed and 32.3% of the anesthesiologists perform a general anesthesia for outpatient surgery.

In the United States, Rabbitts et al. [5] described a national survey of outpatient surgery in children conducted by the National Center for Health Statistics in 1994 to 1996 and again in 2006. This survey identified in 2006, 2,300,651 outpatient anesthesia in children, whose GA rate is 97.45% and the rate of RA still in 2006 is 1.15%.

In France, in a multi-center study of 47 French institutions conducted by ADARPEF (French-speaking Pediatric Anesthesiologists Association) for a period of one year stretching from November 2005 to October 2006. Out of a total of 135,744 anesthetic acts performed in children during this period. Ecoffey et al. [24] show that locoregional anesthesia is 22.9% and general anesthesia is 77%. The rate of RA decreased in France in comparison with that published by Giaufré et al. [25] in 1996, where it was 28.6%.

The results of our survey are not similar to those of the African and Moroccan practice. In Morocco, out of a total of 1600 anesthesia in children aged 0 to 15 years, Hmamouchi et al. [26] over a period of one year (2005), showed that only 304 acts were performed under ALR is 19%. In French-speaking sub-Saharan Africa, Zoumenou et al. [27] show that ALR is carried out in 17% of cases. So in comparison with the LRA practice of the Maghreb countries, Africa and Turkey where the realization of ALR techniques is much slower progress and development compared to other developed countries [28]. Our result is considered relatively better and even in comparison with that of the French practice.

Organizational plan

Ambulatory anesthesia is not governed by precise regulations in Algeria. While the regulations currently require a specific multidisciplinary structure with premises, installation and dedicated staff as is the case in the United States and France [29]. The care of children and adolescents in spaces and the organization of outpatient surgery must be adapted to these patients: the premises have the specificities of pediatric activity in terms of hotel environment (beds cradles, etc.) and technical equipment, and caregivers are trained in pediatrics.

The majority of outpatient anesthesia activity is performed in an unspecified operating theater and non-ambulatory surgical niches and all anesthesiologists hospitalized their patients in a conventional surgical ward. It should be noted that the information system was not protocolised and monitoring was not organized in all hospitals. These organizational and architectural elements were considered by the anesthesiologists as the main factors limiting the development of this type of activity. All anesthesiologists report being dissatisfied with their activity and want to regulate and organize it.

Limitations of the Study

Although the rate of questionnaire respondents is exceptionally modest. We counted the number of institutions that responded, knowing that the number of ambulatory intensive care anesthetist physicians far exceeds 85 physicians. This work reflects in an approximate way the development of the outpatient practice in Algeria. It would be interesting in the near future to expand this survey to all Algerian establishments. This survey was just a draft of a long-term work on pediatric outpatient practice in Algeria. The vast majority of ambulatory surgery is handled by the liberal sector.

Prospects

We note a delay in the development of outpatient anesthesia in children in Algeria. Its development is one of the concerns of child health professionals including pediatric surgeons and paediatricians. To promote it at the level of different institutions, a number of measures must be taken:

- Establishment of a structure dedicated to ambulatory care at each hospital facility.
- Legal and regulatory recognition of pediatric outpatient care.
- Establishment of incentives for the development of outpatient anesthesia in children (outpatient procedure fees).
- Development of institutional recommendations by our Algerian Societies of Anesthesia and Emergency (SAARSIU) and surgical (Algerian pediatric surgery society), established with experts to help reduce disparities between health facilities. These two learned societies must work together to promote ambulatory activity in children.
- Clinical research work and related teaching programs must be initiated and promoted.
- Primary and secondary training of practitioners and hospital staff in ambulatory care.

In a broader context, taking into account the comfort of the patient, the reduction of the length of stay, the reduction of the hospital costs must allow an improvement of pediatric ambulatory anesthesia in our country.

Conclusion

Anesthesia for ambulatory surgery in children is an important part of overall pediatric anesthetic practice, despite all architectural constraints. The main gaps were the lack of information of children and their parents; the structure dedicated to the outpatient, these organizational constraints represented obstacles to the pediatric outpatient practice of which the majority of resuscitative anesthetists expressed their wishes to increase the share of the pediatric outpatients, ambulatory activity in children. This practice survey will provide a reliable working tool for the development of anesthesia and outpatient surgery

in the years to come. This survey on the current state of ambulatory practice in pediatric surgery in Algeria shows that this mode of care is commonly carried out but its practice remains much disorganized in all hospitals.

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