PERIOPERATIVE MANAGEMENT OF THE CHILD WITH BEHAVIORAL DISORDERS

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Abstract

Behavioral disorders can be a normal part of development of a child, or secondary to extraordinary life stresses or associated with a child's inherent disorder. In those children, each hospital visit represents a major challenge for the child, his parents and the hospital staff. Hence, a coordinated approach with a clear plan should be made in advance to minimize child's perioperative stress and to deliver a high quality service.

Introduction

Children with behavioral disorders are likely to require surgery because of coexisting health problems ranging from dental procedures to complex neurosurgery for treatment of epilepsy. In those children, each hospital visit represents a major challenge for the child, his parents and the hospital staff. Hence, a coordinated approach with a clear plan should be made in advance to minimize child's perioperative stress and to deliver a high quality service.

Undesirable behavior can be a normal part of development; a child's ability to understand and interact with the environment is constantly evolving. To learn more about the world, a child experiments with ways of interacting with it. Most often, children test the reactions of the people to whom they are closest, their parents[1]. However, behavioral problems associated with normal childhood development must be distinguished from challenging behavior associated with more complex causes. Challenging behavior is defined as "culturally abnormal behavior of such intensity, frequency or duration that the physical safety of the person or others is placed in serious jeopardy"[2]. Aberrant childhood behaviors can be secondary to extraordinary life stresses. Children living under any condition that seriously threatens healthy and successful transition through a developmental stage are likely to pose serious behavioral problems. This applies to children who witness violence, are members of communities that have experienced a catastrophic event, are exposed to continuous marital discord, have a chronic illness, have a chronically ill sibling or who don't feel wanted[3,4]. The presence of chronic diseases (CD) during childhood such as chronic renal

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disease, diabetes, inflammatory bowel disease, cancer, and sickle cell disease, significantly increases the risk of emotional and behavioral disorders[5,6]. Although many CD are considered rare in childhood, it has been estimated that they affect approximately 15% of the pediatric population. These disorders can be associated with the neurological alterations inherent to the diagnosis itself. However, they can be essentially associated with the innate difficulties of living with a CD. The prevalence of mental disorders in pediatric patients with chronic kidney disease undergoing conservative treatment and hemodialysis is 52.6%[7]. When compared to normal population, children with chronic idiopathic urticaria showed more psychiatric disorders (70.4% vs. 29.6%)[8].

In addition to childhood behavioral problems stemming from normal development and extraordinary life stresses, a third general category involves problems caused by disorders inherent to the child. Attention deficit disorders are the most common and well known, but conduct disorders, depression, pervasive developmental disorders, and other psychiatric diagnoses may manifest during childhood. About 3-5% of children and 10-15% of adolescents will experience psychiatric disorders[9]. Psychiatric disorders have their origins in neurobiologic, genetic, psychological, or environmental sources. Hence, the development of challenging behavior is greatly influenced by person-and environment-oriented factors, which often interact with each other[10]. Examples of these factors are not only the age, gender and level of intellectual disability of persons, but also poor adaptive and social skills, psychological stress, inadequate problem-solving skills, impaired language, socioeconomic deprivation, negative life events, secondary disabilities and psychiatric disorders[11]. Most studies report prevalence rates of challenging behavior among persons with intellectual deficiency between 10 and 20%, while some authors report substantially higher rates[12]. The more severe the disability, the higher the likelihood of the presence of these behaviors. Examples of challenging behavior include verbal and physical aggression, property damage and destructiveness, disruptive and antisocial behavior, overactivity, temper tantrums, screaming, stereotyped and repetitive behavior, general delinquency, and self-injurious behavior, like head punching, self-biting, skin picking and hitting against hard objects or other body-parts[13]. The most prevalent forms of aggression are punching/slapping/pulling (50%), kicking (24%). However only 0.7% of people with learning disability are considered at risk of causing harm to others[14]. Challenging behaviors have a negative impact on persons with intellectual deficiency and their environment, because they increase the risk of reduced quality of life, stressful events, the need for costly residential care and are obstacles to social integration. Moreover, because of their recurrent character, challenging behaviors tend to become a lifelong challenge for the individuals with intellectual deficiency, their family and the involved services[15]. Much research has been conducted on interventions in this area. Treatment strategies that are frequently employed are pharmaceutical and psychotherapeutic interventions, sometimes supplemented with contextual strategies[16].

Preoperative Preparation

Lack of cooperation of a child with behavioral problem can be predictable[17]; therefore

one important principle is that the surgeon notifies in advance the anesthesiologist about the scheduling of such child for a procedure requiring anesthesia. Multidisciplinary discussions about the indications, urgency and timing of interventions requiring anesthesia may be of benefit[18]. Once the anesthesiologist notified, he can contact the parents and the severity of the disability and behavior of the child can be determined. Various strategies may be discussed with them, whilst recruiting their help and support. In children with severe learning disabilities, a multidisciplinary team of support workers trained in communication and interaction with these children is often required to assist them in most aspects of daily living[19]. Eighty percent of children with severe learning disabilities fail to acquire effective speech[20]. Hence, these professional caregivers become an essential interface between the child and the hospital staff. They are able to communicate the child's needs and interpret some of the behavior otherwise dismissed as being part of having a severe learning disability. Professional caregivers usually have a risk profile for each child documenting behavioral patterns, aggression, violence, sources of anxiety, likes and dislikes as well as a history of medical problems and current medications[21]. Management options can be discussed by telephone, at a preoperative assessment clinic or at the routine preoperative visit and should be documented. A clear plan for types and routes of premedication, use of restraint, the choice of induction technique and recovery plans needs to be established. Consent is obtained from the legal guardian, which may be a parent or a representative of the social services.

To many children with behavioral problems, the disruption to their normal routine will be a source of great anxiety and may precipitate panic attacks or temper tantrums; therefore every effort should be made to explain as much as possible to the child in an appropriate way of communication. Interventions may include basic explanation or teaching, as well as behavioral management in more severe cases[22]. A preoperative theater visit, mock inductions, rewards, and family counseling can be of great value. Postponement of the procedure may be appropriate to institute these measures. Children may benefit from behavioral management strategies with play therapists or clinical psychologists[23]. Professional caregivers often have training in behavioral treatments and functional communication which are invaluable in the preparation of the child at hospital. Positive reinforcement techniques target a positive outcome if the desired behavior is obtained e.g. the reward is a drink after the operation. Negative reinforcement focuses on the removal of an undesirable outcome e.g. the pain will be gone. Extensive repetition of these outcomes is used prior to arriving at the hospital and has been shown to reduce challenging behavior. Functional communication allows the child to communicate without resorting to challenging behavior to express themselves[24].

Placing children with behavioral problems first on the operative list is important to minimize waiting or starvation periods and list delays. An early start also allows an early recovery and return home, if suitable. A room on the ward or day care unit should be identified where the child can wait and be assessed minimizing exposure to any stresses but also enabling the caregivers to maintain control easily. Autistic children respond very well to reducing amount of distressing sensory input such as noise, movement and light particularly in unfamiliar surroundings[25]. Outpatients may be allowed to retain their normal clothing and all children are encouraged to bring personal comfort objects to the hospital. A child/family friendly ward, holding area, anesthetic room, operating theater and recovery area, with toys,

games and reading material for a range of ages can be of great help[26]. Staff behavior can greatly affect the frequency and severity of challenging behavior[27]. Hospital staff is usually not trained in communication skills and have been identified as lacking knowledge, training and confidence in managing challenging behavior. However, adequate communication may be easier to achieve in a dedicated pediatric unit.

Premedication

Nonpharmacological approaches applied to relieve child anxiety rarely work alone in children with maladaptive behavioral disorders and hence pharmacological approach is often required[28]. In children with anticipated difficult behavior such as autistic children, noncompliance at induction increased from 22% to 50% when a premedicant was not given[29]. There is a wide variation in premedication requirements depending on the severity of the child's behavior. Careful assessment, based on the individual anesthetist's assessment is therefore needed to judge about the drug and its route of administration.

Premedication modifies behavior by providing amnesia, anxiolysis and sedation. However, there are advantages and disadvantages to amnesia. Any beneficial adaptive behavioral changes gained are not recalled but it may also prevent increasingly maladaptive behavior developing. Sedation may be the most likely behavior change to improve compliance at induction[30]. Premedication should be both acceptable and effective. The oral route is the route of choice. However, not all current formulations are pleasant to taste. Acceptance may require coercion by a trusted companion, disguise in a drink and ingestion in an unthreatening environment, perhaps even offsite. Occasionally, where 'more demanding' challenging behavior has been identified, premedication is required at home prior to arrival at the hospital in order to minimize violent or self-injuring behavior. Benzodiazepines are clearly established as effective premedicant. Midazolam is the most commonly used benzodiazepine for premedication[31]. The recommended optimal oral dosage for midazolam is 0.25-1 mg/kg. The most common used dose is 0.5 mg/kg. Clinical sedative effects of oral midazolam are seen within 10 min and the peak effect is achieved in 20-30 min. Finley et al. showed that midazolam-induced decrease in anxiety was more pronounced for children with higher baseline levels of anxiety. They concluded that midazolam was contraindicated in children with high trait impulsivity and beneficial only if the child has a high state anxiety level at baseline[32]. Oral ketamine is a popular alternative to oral benzodiazepines. Ketamine is not associated with respiratory depression, tachycardia or emergence agitation. A large dose of oral ketamine (3-8 mg/kg) can be well tolerated. In autistic children with behavior disorders, compliance at induction was improved by adding ketamine compared with midazolam alone without any increase in unwanted side-effects[29]. The combination of midazolam and ketamine at lower doses may be used in the extremely uncooperative child[33]. Clonidine is an α_2-adrenergic agonist that has been used as an oral sedative premedication in children. In doses of 2-4 μg/kg, oral clonidine will produce adequate sedation and anxiolysis. Mehta et al. reported successful use of oral clonidine for sedation of autism and pervasive developmental disorders[34]. Dexmedetomidine is a more selective α_2-adrenergic agonist and is

also being used as premedicant in children in oral and intranasal routes. Zub used oral dexmedetomidine at the dose of 1-4 μg/kg and found it effective even in patients with neurobehavioral disorders in whom previous attempts at sedation had failed[35]. When compared to oral midazolam, intranasal dexmedetomidine at a dose of 2.5 μg/kg produces more sedation, but with similar and acceptable cooperation[36]. However, α_2-adrenergic agonists do not have an amnestic effect. The decision about the use of midazolam or α_2-adrenergic agonist will depend on the long-term effects on the implicit and explicit memory of children. Occasionally the oral route may not be possible and alternatives routes should be considered such as intranasal, intramuscular, subcutaneous, rectal and transmucosal (lollipop) routes. However, none of these appear very suitable for a child with severe behavioral problems. Although the aim is to avoid the intramuscular route as much as possible in children, instead of struggling with a combative child for a long time, performing a very brief intramuscular injection may be advised. An intramuscular dose of Ketamine 4-5 mg/kg provides effective sedation in 93-100% of children in 5 min and the duration of action is approximately 45 min[37].

Premedication must be given in a quiet area with minimal distractions. Following premedication, the child should be observed. Before separation from the parent or intravenous access, enough time should be allowed to achieve onset time of premedicant. Once the onset of sedation has occurred, this may allow the application of local anesthetic cream to the hands of the child. Assessment by the anesthetist at regular intervals allows the child to be introduced onto the list at an appropriate time to coincide with the optimal depth of sedation. In such children, there should be no excuse for delays or rush.

The Anesthetic Room

The anesthetic room is used to reinforce calming strategies used so far. Parental presence during induction has been shown to effectively reduce preoperative anxiety in children in certain contexts; when the parent is calm and the child is anxious[38]. However, it's advisable that children with learning disability be accompanied by the primary caregiver who can provide reassurance and interpret any communication or behavioral changes. Low sensory environments such as low lighting and soft music have been shown to reduce anxiety scores on entering the anesthetic room and on induction of anesthesia in children. Various techniques of distraction appropriate for the level of development of the child may be used including music, television, toys or hypnotherapy[39]. Some children violently resist interventions or procedures after careful preparation. These are a challenging group of patients, who risk damage to themselves, and stress to their families and staff. The anesthetist must rapidly decide between postponement or physical restraint. Numerous guidelines exist detailing the correct approaches, techniques and legal aspects of restraint in children[40]. All of these guidelines emphasize that whilst an appropriate level of restraint may be necessary in some situations, the potential hazards such as physical or psychological harm, loss of dignity, and violation of human rights must be recognized and alternative strategies sought wherever possible. In spite of the documented disadvantages, the use of restraint during induction of

anesthesia can be justified as a last resort with parental and staff consent, provided the conditions are appropriate and the indications sufficient. Restraint, once started, must be decisively, speedily and effectively applied by a sufficient number of staff and continued until induction is completed. Restraint techniques should be performed by staff after individualized instructions and not left to a terrified parent. Skilled technique minimizes the risk of harm to child and staff[41]. Both types of induction of anesthesia, inhalation or intravenous can be safe, and their success depends upon the regular practice of appropriate methods and protocols.

Emergence agitation may be more common during recovery in children with prior behavioral problems. Tait demonstrated that, compared to children without attention deficit, hyperactivity disorder (ADHD), children with ADHD exhibited an increase in maladaptive behaviors postoperatively[42]. To decrease the incidence of emergence agitation, a number of pharmacologic and non-pharmacologic approaches have been recommended. Some authors recommended the avoidance of low solubility inhalational anesthetic, the preoperative and intraoperative administration of clonidine or dexmedetomidine[43], as well as the use of propofol as total intravenous anesthesia or as single injection before the end of surgery[44,45]. Involving the parents early in the recovery phase and removal of i.v. drips and cannulae is important. The administration of i.v. fluids and antiemetics to allow early removal of the i.v. cannula before the child becomes distressed by its presence should be routinely done. Analgesia must be carefully managed as children with learning difficulties may have difficulty in expressing the location and intensity of pain postoperatively. Simple analgesics should be used routinely and supplemented by a local anesthetic technique if appropriate.

Consideration must also be given to the place of recovery. It is important to realize that children with behavioral problems react badly to any change in their routine and therefore waking up in strange surroundings can be very alarming for them. Management as ambulatory cases with early discharge is also aimed for in order to return patients to their normal environment at the earliest opportunity. If they need overnight admission, the provision of a side room in the ward to minimize exposure to other people might be beneficial.

Children with behavioral disorders are a varied group ranging from normal to children with severe intellectual deficiency. Children with disability and their parents often feel undervalued and stigmatized. Health care professionals need to reflect on their own attitudes and values to ensure that the care delivered is of an equally high standard to that normally provided to children without disability. Awareness and understanding of their special requirements is essential when devising a management plan. Advanced planning, flexible admission system, communication between surgeons, anesthetists, nurses, parents, caregivers and most importantly the child is vital to ensure that the visit to the operating room is as smooth and stress-free as possible.

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