Dental Care for Children With Attention Deficit Hyperactivity Disorder

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ABSTRACT

Attention deficit hyperactivity disorder (ADHD) is one of the most common biobehavioral disorders of childhood. ADHD has displayed increasing prevalence worldwide. Often, ADHD is mistaken for other problems, thus it is important that pediatric dentists identify and manage these children appropriately. This manuscript discusses how dental clinicians should treat children with ADHD.
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KEYWORDS: ATTENTION DEFICIT HYPERACTIVITY DISORDER, ORAL MANIFESTATIONS, MANAGEMENT

Attention deficit hyperactivity disorder (**ADHD**) is a chronic biobehavioral disorder of childhood, and can continue into adolescence and adulthood. Hyperactivity, impulsivity, and/or inattention are the distinguishing behavior characteristics of this disorder, although all three characteristics may not be present in a single patient.[1] Diagnosis of ADHD involves careful observation and information gathering about the child by a specialist, according to the criteria described in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V): the child must possess 6 or more of the symptoms in the bracket of inattention or hyperactivity-impulsivity, over a 6 month period to a degree which is maladaptive or inconsistent with the developmental level of the child.[2] The American Academy of Pediatrics has provided clinical practice guidelines on the assessment and diagnosis of schoolaged children with ADHD.[3]

Children diagnosed with ADHD experience adjustment problems in academic, family, and social settings due to increased demands on their executive function skills (supervisory attentional system or cognitive control). These children can be impulsive, fidgety, and distracted, and have difficulty controlling their behavior. They may also present psychiatric co-morbidities that change throughout their lifespan, moving from oppositional defiant disorder (40%), conduct disorder (14%), anxiety disorder (31%), and mood disorder (4%) in children to depression, anxiety, conduct problems, and substance use disorder (**SUD**) in adolescence.[4,5]

PREVALENCE

The worldwide prevalence of ADHD in children is approximately 5%. Overall, the disorder occurs 3 to 6 times more frequently in boys than girls (4:1 ratio for the predominantly hyperactive type and 2:1 ratio for the predominantly inattentive type).[6] The prevalence rates of ADHD diagnosis increased approximately 6% per year from 2003 to 2007.[7]

ETIOLOGY

Multiple factors—including genetics, environmental factors (eg, lead exposure and alcohol consumption during pregnancy), brain injuries, and the social environment—have been suggested as underlying causes of ADHD.[8, 9] Studies of monozygotic twins have concluded that there is a 90% chance that they will both suffer from the disorder.[10]Additionally, a child born to an ADHD parent has a 57% greater probability of having ADHD.[11] Brain imaging studies have shown

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that patients with ADHD have widespread cortical thickness reductions.[12] Some have observed alterations in the sensory neural network, especially regarding dopamine.[13]

TREATMENT MODALITIES

Although many symptomatic treatment modalities have been found to be successful, there is no cure for the disorder. Its management involves a combination of medications, behavior modification, lifestyle changes, and counseling.[14] Stimulant medications (e.g., methylphenidate, amphetamine, and dextroamphetamine) increase the active concentration of dopamine and norepinephrine in the ill-functioning regions of the brain, thereby increasing the child's attention span and concentration, and reducing hyperactivity and impulsivity.[15]

DISCUSSION

MANAGEMENT IN THE DENTAL CLINIC

Like all other social surroundings, the dental environment can be both daunting and challenging for a child with ADHD. In many cases, ADHD is combined with a learning disability, which may lead to impulsivity and attention deficit in situations with intellectual overload (i.e., increased cognitive load due to ill-functioning brain), such as a dental appointment.[16] Motor restlessness, inability to pay attention during the dental appointment, and failure to keep up with home care instructions should not be misconstrued as noncompliance but as a component of the disorder. The dentist is, thus, required to have a lot of patience with the child for a productive dental appointment.

PREAPPOINTMENT PREPARATION

Parents should be guided by the dentist on how to acquaint the child with the proceedings of a dental visit. A tour of the office will benefit the child by familiarizing him/her with the dental environment and, thus, lowering anxiety levels.

APPOINTMENT SCHEDULE

The dental appointment should be scheduled early in the morning when both the child and the dentist are less fatigued. Another factor favoring this arrangement is that the medication regimens are designed such that their peak effect is during the earlier part of the day. Children taking short-acting stimulant medications may be highly symptomatic for ADHD in periods when the drug is not acting. These medications tend to have a "rebound effect" between doses, and care should be taken not to schedule a dental appointment during these periods of drug remission.

INTERACTIONS IN THE DENTAL OPERATORY

Children with ADHD may have major sensory processing problems, which may result in both over- and under-responsivness.[17] Hypersensitivity to auditory sounds may make an affected child uncomfortable in the dental clinic due to the plethora of sounds that he or she is exposed to. Thus it is important to minimize auditory stimulation during the dental visit. Conversely, the child may completely disregard any guidance given by the pediatric dentist. Therefore, it becomes important to give deliberate, short and clear instructions to the child and use interactive behavior management strategies like tell-show-do and positive reinforcement. "Time outs" or breaks, which can be given to the child during the dental procedure, involve allowing him/her to get out of the dental chair and indulge in a favorite activity.

Children who fail to respond to nonpharmacologic behavior management may need mild or moderate sedation. When prescribing a sedative drug, the dentist must consider that children with ADHD are generally on stimulant medication, which may antagonize the sedative effect.[18] Although some practitioners have documented failed sedations or the requirement of higher drug concentrations,[19] others have successfully sedated children with this disorder. The dental professional must consult with the child's physician before prescribing any sedative medication. A study found demerol/promethazine/nitrous oxide sedation to be effective in managing children with ADHD.[20] The use of general anesthesia (**GA**) for these children has not been extensively documented. A prospective study comparing the use of GA for children with and without ADHD undergoing elective surgery showed that induction procedures can be extremely challenging in those with ADHD, and that there was an increase in maladaptive behavior postoperatively.[21]

Affected patients have higher plaque indices and lower unstimulated salivary flow, thus making preventive programs and continuous reinforcement a continuous requirement.[22] Home care instructions should preferably be in written form, as these children are extremely forgetful and disorganized. Parental supervision is a must. Balance and stability tend to be impaired in children with ADHD, making them susceptible to traumatic dental injuries.[23,24] Anticipatory guidance should be provided to parents on how to prevent and manage such injuries. There is also a high prevalence of dyskinesia and bruxism in these children.[25] Custom-fabricated occlusal splints may help children deal with the latter. In addition to that, central nervous system stimulants have been found to be helpful in reducing oral parafuntion in children with ADHD.[26] These medications must be prescribed in consultation with the attending physician.

Stimulant medications may produce side effects such as dry mouth, altered taste sensation, and bruxism.[27,28] Additionally, these children may be taking medications in syrup form, which may contain high concentrations of sugar, making them susceptible to dental caries. The pediatric dentist must make parents and other healthcare providers aware of this important fact. Medications should be changed to pills or caps as soon as the child is able to swallow them.

Another area of concern associated with ADHD is SUD.[29] The etiology of SUD has also been linked to dopamine; thus, common factors in the development of ADHD and SUD may exist.[30] Pharmacotherapy for ADHD may reduce the risk for development of SUD. Although psychostimulant drugs can potentially be abused, newer formulations and delivery systems have been developed to lower this liability. Pediatric dentists are in an advantageous position to identify and screen adolescents with or at risk of SUD.[31] Identification of SUD is important to prevent complications from conscious sedation, local anesthesia, and other drug interactions. Pediatric dentists can also provide the patient with preventive messages and make an important contribution toward mitigating this problem.

Treating a child with ADHD in the dental operatory can be both formidable and frustrating. Parents and dentists should be aware of the various dental problems that these children are susceptible to and take necessary precautions to prevent them.

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