

Primljen/ Received on:24.09.2017.  
Revidiran/ Revised on :20.10.2017.  
Prihvaćen/ Accepted on:28.10.2017.

INFORMATIVNI RAD  
INFORMATIVE  
ARTICLE  
doi:10.5937/asn17767861

## STOMATOLOŠKA ZAŠTITA DECE SA POREMEĆAJIMA AUTISTIČNOG SPEKTRA

## DENTAL HEALTH CARE FOR CHILDREN WITH AUTISM SPECTRUM DISORDERS

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### Sažetak

**Uvod:** Poremećaji autističnog spektra (ASD) su pervazivni poremećaji koji počinju u ranom detinjstvu. Prevalencija ovih poremećaja se u poslednjih nekoliko decenija povećala. Sam poremećaj nema direktni uticaj na oralno zdravlje, ali ponašanje dece može bitno da ga ugrozi. Zbog neprihvatanja održavanja oralne higijene, u usnoj duplji se nagomilava dentalni biofilm koji dovodi kako do karijesa i kasnije njegovih komplikacija tako i do nastanka gingivoparodontalnih oboljenja. Veliki procenat dece sa ASD tokom stomatološke intervencije ne saraduje, hiperaktivno je, napeto i uznemireno. Sve to komplikuje stomatološku intervenciju i onemogućava njeno izvođenje, zbog čega su i indikacije za ekstrakcije zuba proširene. Kako bi se sačuvalo oralno zdravlje dece sa ASD potreban je individualni pristup svakom pacijentu.

**Zaključak:** Put do zdravih usta i zuba kod dece sa ASD je dug i mukotrpan, nije neostvariv i nemoguć, ali od roditelja i dečjeg stomatologa zahteva veliko strpljenje i upornost.

**Ključne reči:** autizam, stomatološka zaštita

### Abstract

**Introduction:** Autism spectrum disorders (ASD) are pervasive disorders beginning in early childhood. The prevalence of these disorders has been on the rise over the last few decades. A disorder of this kind does not have any direct impact on the oral health, but the behavior of the affected children can markedly deteriorate it. Due to a poor compliance to oral hygiene and maintenance of oral health, dental film accumulates in the oral cavity, leading to both caries and its complications, and gingival-periodontal diseases. A high percentage of children with ASD are not sufficiently compliant during dental interventions, being hyperactive, tense, and often highly agitated. Any dental intervention in such children is therefore very complicated or it cannot be performed at all, consequentially broadening the spectrum of indications for dental extractions. In order to preserve the oral health in children with ASD, an individualized approach to each patient is thus necessary.

**Conclusion:** The journey to a healthy oral cavity and teeth in children with ASD is full of twists and turns, but the desired goals can be realized, although requiring considerable patience and perseverance from both the parents and pediatric dentists.

**Key words:** autism, dental health care

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## Uvod

Poremećaji autističnog spektra (ASD) su biološki razvojni poremećaji ljudskog mozga, koji su zbog svoje prirode nastanka i široke manifestacije vrlo složeni. Autistični poremećaj je pervazivni poremećaj koji počinje u ranom detinjstvu. Osnovni simptomi bolesti su nedostatak emocionalnih odgovora prema okolini, odnosno ljudima, stvarima i događajima koji ih okružuju, nedostatak verbalne i neverbalne komunikacije, naročito poremećaj u razvoju govora, bizarnosti u ponašanju i stereotipije.

Poremećaji autističnog spektra su etiološki različita grupa poremećaja koju povezuje slična klinička slika. Obuhvata nekoliko neurorazvojnih poremećaja u okviru kojih postoje značajna odstupanja:

- u socijalnom razvoju,
- razvoju socijalnih veština i
- neobična ponašanja i interesovanja.

U ovu grupu poremećaja ubrajaju se:

1. Autistični poremećaj, F84.0,
2. Rettov poremećaj, F84.2,
3. Dezintegrativni poremećaj, F84.3,
4. Aspergerov poremećaj, F84.5,
5. Pervazivni razvojni poremećaj neodređen, uključujući i atipični autizam, F84.9.

Brojni faktori se dovode u vezu sa nastankom ASD, za mnoge je utvrđena i korelacija, ali nema dokazane uzročno-posledične veze koja bi jedan ili nekoliko faktora izdvojila kao osnovne etiološke faktore.

Autistični poremećaj je globalni razvojni poremećaj koji počinje u ranom detinjstvu i najčešće traje tokom celog života. U proteklih 50 godina, učestalost autizma se povećala čak 15 puta. U svetskoj populaciji pojavljuje se u 0,2%. Incidencija autizma se kreće od 2-5:10000, i mnogo je češća kod dečaka (4:1)<sup>1,2,3,4</sup>. S obzirom na sve veću prevalenciju ASD, dečji stomatolozi su u prilici da se sve češće susreću sa ovim pacijentima u stomatološkim ordinacijama. Sama stomatološka intervencija, koju je neophodno sprovesti kod dece sa ASD, može biti jako komplikovana zbog nesaradnje pacijenata. Osim toga, roditelji ove dece su jako obazrivi i zahtevaju dodatna objašnjenja od stomatologa vezana za materijal koji će se koristiti u restaurativnim procedurama, zbog sumnje u toksičnost amalgama i fluorida<sup>5</sup>.

## Introduction

Autism spectrum disorders (ASD) are biological developmental disorders of the human brain, very complex due to their origin and diverse manifestations. An autistic disorder is a pervasive disorder beginning in early childhood. The most obvious symptoms of the condition are the lack of emotional response to environmental stimuli – people, material world and events around them, absence of both verbal and non-verbal communication, speech development disorders, bizarre behaviors and stereotypes of autism.

Autism spectrum disorders include a number of etiologically diverse disorders sharing a similar clinical picture. These involve several neurodevelopmental disorders characterized by marked deviations in the following elements:

- social development
- development of social skills and
- behavior and interests

The following disorders are classified as ASDs:

1. autistic disorder, F84.0
2. rett syndrome, F84.2
3. childhood disintegrative disorder, F84.3
4. asperger syndrome, F84.5
5. pervasive developmental disorder not otherwise specified, including atypical autism as well, F84.9.

A multitude of factors have been associated with the development of ASD, a number of them even correlated, but the cause-and-effect relationship (that would single out one or several factors as the principal etiological factors) could not be established.

Autistic disorder is a global developmental disorder with the onset in early childhood that usually lasts a lifetime. Over the last 50 years, the prevalence of autism has increased as much as 15 times. It occurs in 0.2% of the world population. The incidence of autism ranges from 2-5:10,000 (with a male-to-female ratio of 4:1)<sup>1,2,3,4</sup>. In view of the rising prevalence of ASD, pediatric dentists more often treat such children in their clinics. The dental intervention itself, when required in children with ASD, can be very complicated due to a lack of compliance by such patients. Moreover, the parents of children with ASD are very cautious and often ask for additional explanations from the dentists related to the materials to be used in restorative procedures, expressing their doubts and uncertainties regarding the toxicity of amalgams and fluorides<sup>5</sup>.

Zbog toga je neophodno da se razvije dobar, iskren odnos sa roditeljima, kako bi prihvatili preporučene stomatološke intervencije. Osim toga, pojedina deca sa ASD prenaplašeno reaguju na specifične zvuke, svetlost, miris, dodir, a sve to je neizostavni deo stomatološke intervencije. Zbog toga je i prva poseta stomatološkoj ambulanti veoma važna, jer od prvog kontakta može umnogome zavistiti da li će se buduća saradnja sa stomatologom odvijati u pozitivnom ili negativnom pravcu. Prvim stomatološkim pregledom se često može ustanoviti da li će se potrebni stomatološki tretman moći da obaviti u ordinaciji, ili će biti potrebna primena sedacije ili opšte anestezije.

#### *Ponašanje dece sa ASD u stomatološkoj ordinaciji*

Dolazak deteta sa ASD u stomatološku ordinaciju može biti jako traumatičan za samog pacijenta i roditelja, ali isto tako i naporan za stomatologa. Baš iz tog razloga, kao i zbog neblagovremenog dolaska, ekstrakcije zuba su najčešće intervencije kod ove dece. Deca sa ASD su u velikom procentu nesaradljiva, često pokazuju hiperaktivnost, napetost, kratko vreme pažnje i uznemirenost. Repetitivno ponašanje, nepredvidivo i nekontrolisano pomeranje tela takođe mogu da komplikuju samu intervenciju, ali i da ugroze sigurnost, kako pacijenta tako i stomatologa i stomatološkog osoblja. Svaka promena u njihovoj rutini može da predstavlja veliki problem i da dovede do paničnih napada. U takvom stanju, oštro zabranjuju pristup usnoj duplji, odupiru se fizičkom savlađivanju i destruktivno se ponašaju prema okolini. Ovakvo ponašanje predstavlja najveću prepreku dečjem stomatologu u pružanju intervencije.

#### *Oralno zdravlje dece sa ASD*

Poremećaj autističnog spektra sam po sebi nema nikakav uticaj na oralno zdravlje obolele dece. Prevalencija karijesa kod dece sa ASD je predmet brojnih istraživanja. Podaci iz literature su dosta kontradiktorni. Dok neki autori ukazuju da je prevalencija karijesa kod dece sa ASD veća nego kod zdrave dece, drugi, pak, svojim istraživanjem potvrđuju da nema bitne razlike u prevalenciji karijesa<sup>6,7,8,9</sup>. Takođe, utvrđena je visoka korelacija između brige o obolelom detetu i oralnog zdravlja. To znači da oboleli čiji su roditelji upoznati sa prirodom bolesti njihovog deteta i samim tim pronašli odgovarajući način za kvalitetno i redovno održavanje oralne higijene, imaju manju prevalenciju karijesa i bolje oralno zdravlje<sup>10</sup>.

It is therefore of paramount importance to develop an adequate, open and sincere relationship with the parents, so that they can consent to the suggested dental procedure. In addition, some children with ASD tend to react excessively to specific sounds, lighting, smell, touch, and these are all integral parts of a dental intervention. The first visit to a pediatric dentist is therefore very important – the first contact can largely influence further cooperation and determine its development in both a negative and positive direction. The first dental examination will often determine whether the required treatment can be done in the dental clinic, or a sedation or general anesthesia will be necessary.

#### *Behavior of children with ASD in a dental office*

Any visit of a child with ASD to a dental office can be very traumatic for both the patient and his parent, but sometimes equally arduous for the dentist. For exactly these reasons and too late visit to a dentist, dental extractions are the most common interventions in these children. Children with ASD are mostly non-compliant, often hyperactive, tense, unattentive, and highly agitated. Repetitive behaviors, unpredictable and uncontrolled movements of the body, additionally complicate the required intervention, but can also affect the safety of both the patient himself and dentist or those who assist in the procedure. Any change in the routine of such children can pose a huge problem and cause panic attacks. In such a state, the children refuse to allow any access to their oral cavity, they fiercely resist any physical restraint attempt and are often destructive to the immediate environment. Such a behavior is the greatest obstacle to a pediatric dentist trying to treat these patients.

#### *Oral health in children with ASD*

Autism spectrum disorders by itself do not have any impact on the oral health of affected children. The prevalence of caries among the children with ASD has been extensively studied. The literature data are rather inconsistent. While some authors report a higher prevalence of caries in ASD children compared to their healthy peers, others state that there is not any significant difference in the prevalence of caries between these groups<sup>6,7,8,9</sup>. In addition, a strong correlation has been established between the general care for the affected child and its oral health.

Samo ponašanje dece sa ASD može bitno uticati na zdravlje njihovih usta i zuba. Zbog neprihvatanja održavanja oralne higijene, u usnoj duplji se nagomilava dentalni biofilm, koji dovodi do karijesa, njegovih komplikacija i do nastanka gingivoparodontalnih oboljenja. Ortodontske nepravilnosti su takođe prisutne kod dece sa ASD, a najčešće su obrnuti preklap, ukršteni zagrižaj i II klasa po Angleu<sup>11</sup>.

Kao posledica smanjene salivacije, do koje dolazi usled primene pojedinih medikamenata koji se koriste u terapiji ASD (antipsihotici i anksiolitici), i nagomilavanja dentalnog biofilma, prevalencija heilitisa i gingivoparodontalnih oboljenja je velika<sup>12</sup>.

Zbog smanjenog osećaja na bolni nadražaj, naspecifičnog odgovora i poremećaja u registrovanju osećaja u usnoj duplji, kod dece sa ASD često dolazi i do oralnog samopovređivanja. Oralno samopovređivanje uključuje autoekstrakciju zuba (najčešće mlečnih), ugrize jezika, usana, obraza, a takođe i mehaničko povređivanje čitave oralne sluzokože<sup>12,13,14</sup>. Izazivanjem takvih povreda, autistično dete skreće pažnju na sebe i izaziva neku svoju želju ili potrebu. Oralno samopovređivanje je kompleksan problem, u čijem lečenju, pored dečjeg stomatologa, treba uključiti psihologa i psihijatra. Za rešavanje takvih situacija ne postoje univerzalna rešenja, već se svaki slučaj treba posmatrati izolovano, uz što bolje razumevanje odnosa unutar porodice, kao i uz obavezno uspostavljanje poverenja i među terapeuta i pacijenta.

#### *Preventiva, profilaksa i terapija oboljenja usta i zuba kod dece sa ASD*

Preventivne, profilaktičke i terapijske mere za očuvanje oralnog zdravlja koje se primenjuju kod dece sa autizmom ne razlikuju se bitno od preventivnih i profilaktičkih mera koje se preporučuju zdravoj deci. To su, pre svega, pravilno i redovno održavanje oralne higijene, saveti o ishrani, primena preparata sa fluoridima i zalivanje fisura, kao i redovni pregledi kod stomatologa. Razlika je u tome što je za sprovođenje ovih mera kod dece sa autizmom potrebno mnogo više vremena, strpljenja i pažnje.

S obzirom da autistična deca teško prihvataju promene, edukacija o održavanju oralne higijene je često mukotrpana i dugotrajna. Svaku promenu treba postepeno uvoditi, kako bi pojedine radnje dete uvrstilo u svoju rutinu.

This means that the children, whose parents are well informed about the nature of their disease and have found an appropriate way to assure a high level of quality and regular oral hygiene of their children, have lower caries prevalence rates and better overall oral health<sup>10</sup>.

The behavior of children with ASD can have a marked impact on the health of their mouth and teeth. Poor compliance in the maintenance of oral hygiene leads to the accumulation or dental biofilm, with subsequent development of caries and its complications, as well as gingival-periodontal diseases. Orthodontic irregularities are also present in children with ASD, with reverse overlaps, crossbites, and Angle Class II malocclusions being the most common<sup>11</sup>.

As the consequence of reduced salivation (caused by some of the medicaments used to treat ASD – antipsychotic and anxiolytic drugs), and dental biofilm accumulation, the prevalence of cheilitis and gingival-periodontal diseases is rather high<sup>12</sup>.

Self-inflicted oral injuries are common in children with ASD due to their reduced pain sensation, non-specific responses, and oral cavity perceptual disorders. Self-inflicted oral injuries involve autoextraction of teeth (most commonly primary teeth), tongue bites, lip and cheek bites, and mechanical injuries of the oral mucosa as a whole<sup>12,13,14</sup>. By the infliction of such injuries, a child with ASD commonly draws attention, and expresses a need or a wish. Self-inflicted oral injuries are a complex problem, the management of which should generally involve, in addition to a pediatric dentist, a psychologist or a psychiatrist. There is not any universally recognized therapy for the situations such as these – each case should be considered individually, with an adequate understanding of the interfamily relationships and trust-building between the child and its therapist.

#### *Prevention, prophylaxis, and therapy of dental and oral cavity diseases in children with ASD*

Preventive and prophylactic and therapeutic measures in the maintenance of oral health in autistic children are not very much different from those recommended for their healthy peers. They consist of proper and regular maintenance of oral hygiene, nutrition advice, use of fluoride preparation and fissure sealing, as well as regular dental appointments.

Ovo podrazumeva savete roditeljima koji moraju saradivati sa stomatologom, jer bez te saradnje neće biti ni uspeha. Četkanje zuba treba započeti igrom. Detetu se daje četkica koju će koristiti van kupatila. Kada prihvati ovo, dete se uvodi u kupatilo, zatim se postepeno dodaje i pasta za zube, pa četkanje zuba uz pomoć roditelja. Ovaj postupak može trajati nedeljama, ali će na kraju dovesti do značajnih rezultata kada dete samo pere zube. Naravno, nikako se ne smeju izostaviti pohvale i odobravanja za svaki korak i dobro ponašanje<sup>15,16</sup>.

U prevenciji karijesa ishrana ima značajno mesto. Primećeno je da je ishrana bogata ugljenim hidratima sastavni deo svakodnevne ishrane, a često predstavlja i vrstu nagrade detetu sa ASD koje je uspešno obavilo neki postavljeni zadatak. Ovaj sistem nagrađivanja, pogotovo ako se daje između obroka, može značajno uticati na povećanje prevalencije karijesa. Zbog toga, pravilna (nekariogena) ishrana mora biti važan faktor u edukaciji i obuci roditelja dece sa ASD. Roditelje treba upozoriti na štetnost zaslađene hrane i sugerisati im da slatkiše deci daju uz glavni obrok. Osim toga, usmene savete o ishrani treba obavezno završiti davanjem pisanih beležaka, koje će poslužiti kao podsetnik kod kuće.

Princip stomatološkog zbrinjavanja u prvi plan stavlja eliminaciju bola i sprečavanje uticaja oralnih oboljenja na opšte zdravlje. Ovaj nivo stomatološke zaštite je standardan (uobičajen), jer priroda samog oboljenja i socijalno okruženje onemogućavaju složenije stomatološke intervencije, zbog čega su i indikacije za ekstrakcije zuba proširene.

Kako bi se izbegla traumatična i kontraproaktivna iskustva, posete stomatologu treba uvrstiti u navike autistične dece. Naime, preporučuje se dovođenje deteta u stomatološku ordinaciju jednom nedeljno, kako bi se postepeno naviklo na ambijent, stomatološko osoblje, zvukove i mirise. Što se ranije krene sa procesom navikavanja, efekat je brži i bolji<sup>17,18</sup>. Deca sa ASD imaju izražene vizuelne sposobnosti i mnoga od njih bolje razumeju pisanu poruku ili poruku putem slike. U poslednje vreme prisutni su brojni projekti koji pokušavaju da pripreme dete na vizuelnu komunikaciju putem slika umesto reči. U te svrhe koriste se knjige sa različitim slikama na kojima je prikazano šta od autističnog deteta stomatolog očekuje. Nakon 18 meseci od započinjanja projekta deca

The principal difference is contained in the fact that these measures in autistic children require much more time, patience, and attention.

In view of the fact that autistic children do not accept changes easily, education about their oral hygiene is not easy to perform and requires considerable time and efforts. Each change should be introduced step-by-step, so that the child should gradually accept it and integrate it into its own routine. This involves parent counseling as well, who have to collaborate closely with the dentist, since success cannot be guaranteed otherwise. Tooth brushing, for instance, should be introduced in the form of a game. A child is given a toothbrush to use it outside the bathroom. When the child accepts it as an object, the game is repeated in the bathroom; a toothpaste is then introduced, and after that the proper tooth brushing with parental assistance. The procedure may last for weeks, but will eventually produce a significant result – the child will brush its teeth all by itself. Expressions of approval and awards must not be forgotten in the process for each successful step and desirable behaviors<sup>15,16</sup>.

In the prevention of caries, nutrition has a marked place. It has been noted that carbohydrate-rich foods constitute a significant portion of everyday nutrition, being even a kind of reward for a child with ASD for a successfully accomplished task. Such a reward system, especially between the meals, can have a significant impact on the higher prevalence of caries. Proper (non-cariogenic) nutrition should become an important element in the education and training of parents with ASD children. Parents should be warned of the adverse effects of sugar foods and advised to give sweets to their children with one of the main meals. Furthermore, oral advice should always be supported with written information to the parents (to serve as a reminder at home).

The principle of dental care primarily focuses on the elimination of pain and aims to prevent the impact of oral diseases on general health. This level of dental care is a standard one (usual), since the nature of the disease and aspects of social environment make more complex interventions unfeasible, broadening therefore the field of indications for tooth extraction.

In order to avoid traumatic and counterproductive experiences, dental appointments should become an integral part of the routine of an autistic child. Dental appointments once a week are thus recommended, so that the child gets used to the den-

su u stomatološkoj ordinaciji saradivala, odnosno sedela u stomatološkoj stolici i široko otvarala usta. Najveći broj dece je čak i dozvoljavao pregled ogledalcem, lokalnu aplikaciju fluorida i mašinsko uklanjanje naslaga sa zuba. Prosečan broj poseta da bi se ovo postiglo je bio oko četiri. Za decu sa ASD, vizuelna pedagogija je jedan od načina da se sprovede stomatološka nega i postigne bolje oralno zdravlje i kvalitetnije življenje<sup>19</sup>.

Ponašanje i nesaradnja deteta sa ASD u stomatološkoj ordinaciji je glavna prepreka u pružanju stomatoloških intervencija. Kod nekih se metoda „kaži-pokaži-uradi“ pokazala kao veoma uspešna, dok je kod drugih (naročito kada je verbalna komunikacija otežana) uspeh izostao<sup>20,21</sup>. Zato je u slučajevima kada je nemoguće uspostaviti saradnju indikovano da se stomatološke terapijske procedure obave u opštoj anesteziji<sup>22,23</sup>. Tada se u jednoj seansi uklanjaju meke i čvrste naslage sa zuba, sanira karijes, zalivaju fisure i na kraju ekstrahiraju zubi koje nije moguće sanirati.

### **Zaključak**

Deca sa ASD zaslužuju i trebalo bi da imaju dobro oralno zdravlje. Put do zdravih usta i zuba je dug i mukotrpan, ali uz veliku upornost i strpljenje roditelja i dečjeg stomatologa nije neostvariv i nemoguć. Važan zadatak dečjeg stomatologa je da se zdravlje dece sa ASD što više približi onome kod zdrave dece, pri čemu treba voditi računa da bazu prevencije predstavlja zdravstveno – vaspitni rad, koji treba da bude tako koncipiran da maksimalno motiviše i uključi roditelje i decu u borbu za zdrava usta i zube.

### **Zahvalnost**

Autori nemaju nikakvu finansijsku korist ili sukob interesa.

tal clinic environment, personnel, sounds, and smells. The effect is even better if the process of accommodation is started early during the life of an autistic child<sup>17, 18</sup>. Children with ASD often have excellent visual abilities and many of them understand better written or pictorial than verbal information. Recently, numerous projects have been initiated trying to prepare autistic children for visual (pictorial) instead of verbal communication. Various books have been used with pictures, trying to explain what is the expectation of a dentist from an autistic child. After 18 months of the project, children were able to cooperate to a certain degree, i.e. to sit in the dental chair and open their mouth widely. Most of the children even consented to dental mirror visual examination, local fluoride application, and ultrasound dental plaque removal. The average number of appointments to achieve this was around four. For children with ASD, visual pedagogy is one of the ways to administer dental care and achieve better oral health and quality of life<sup>19</sup>.

Behavior and non-compliance of children with ASD in dental clinics is the main obstacle in their adequate dental care. In some of them, the method „tell-show-do“ has been very successful, while in others (especially in the cases with difficult verbal communication) it has not<sup>20,21</sup>. In the cases in which cooperation cannot be established, therapeutic dental procedures should be done under the general anesthesia<sup>22,23</sup>. In a single instance, soft and hard dental accumulations can thus be removed, caries can be treated, fissures can be sealed, and dental extractions, if needed, can be accomplished.

### **Conclusion**

Children with ASD certainly deserve and should good oral health. The road to success is a long and rocky one, but with patience and perseverance of both the parents and pediatric dentist, the success is at hand. Pediatric dentists should strive to improve the oral health of children with ASD and bring it as close as possible to the level reached in healthy children, taking care that the basis of prevention is in fact health education targeted to adequately motivate and involve both the parents and their children in the fight for healthy oral cavity and teeth.

### **Acknowledgement**

The authors have no any financial benefit or conflict of interests.

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