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## A LITERATURE REVIEW ON TECHNIQUES OF TREATING PEOPLE WITH AUTISM SPECTRUM DISORDER DURING DENTAL PROCEDURES

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### SUMMARY

*It was noted that parents frequently avoid taking their child with autism spectrum disorder (ASD) for routine examinations, because of the children's fear of dental procedures, or difficulties in locating a practitioner willing to provide care, or specialized to treat such individuals.*

*The aim of this paper is to recognize obstacles that patients with ASD and their caregivers encounter in getting dental care, as well as to present different techniques that can be used in dental setting in order to help people with ASD overcome those obstacles.*

*The Serbian Library Consortium for Coordinated Acquisition–KoBSON, as well as Google Scholar Advanced Search were used when reviewing the literature.*

*By reviewing the literature, the main obstacles were stated to be individual characteristics of people with ASD and lack of dental staff training in treating people with ASD.*

*Techniques that can be used to improve dental care of patients with ASD are minimized sensory stimulation, short visits to the dental clinic and minimized wait time, several rehearsals in a mock environment, as well as working with the same dentist. Behavioural strategies can also be used, electronic screen, visual supports, or Picture Exchange Communication System. If all of the above does not give results, dental treatment can be provided under general anesthesia or physical restraint.*

*In conclusion, we give recommendations for University school of dentistry to involve treating people with ASD in their practical aspects of studies, as well as educate prospecting students in using some of the stated techniques.*

Key words: autism spectrum disorder, dental care, techniques

### INTRODUCTION

There are so many definitions used to describe autism spectrum disorder (ASD), but the majority of authors agree that autism spectrum disorder is a life-long neurodevelopmental disorder characterized by qualitative abnormalities in reciprocal social interactions and patterns of communication, and by a restricted, stereotyped, repetitive repertoire of interests and activities (Barbaresi, Katusic, & Voigt, 2006; Dover & Lecoteur, 2007; Friedlander, Yagiela, Paterno, & Mahler, 2006). It has been reported in many studies that the male to female ratio is 4:1 with more severe symptoms exhibited in females (Klein, 1998; Medina et al., 2003).

The diagnosis of ASD is based on 4 criteria (Barbaresi et al., 2006; Rapin & Tuchman, 2008; Spence, Sharifi, & Wiznitzer, 2004): serious alterations in social relations; serious

alterations in the development of communication; patterns of behavior, interests and activities that are restricted, repetitive, and stereotyped; and early onset, before 3-5 years of age. Boulet et al., (2009) reported that intellectual disability is frequent in people with ASD, having an estimated prevalence of 75% (Rapin & Tuchman, 2008; Spence et al., 2004). Behavioural disturbances associated with ASD include self-injurious behaviour, aggression, temper tantrums, psychiatric symptoms and pica (Friedlander et al., 2006; McAdam, Sherman, Sheldon, & Napolitano, 2004), as well as uneven intellectual development, peculiar repetitive body movements, hyperactivity, limited attention span and a low frustration tolerance, that may lead to temper tantrums or bizarre vocalization (Kamen & Skier, 1985). Even if small changes in their daily routine are made, temper tantrums may easily be provoked (Burkart, 1984; Wedel, McKown, Sanders, 1994).

ASD may also be associated with unusual responses to sensory stimuli, such as oversensitivity to unfamiliar sounds, touch, and heightened reactions to light (DSM-IV, 2000), but they can also have hyposensitivity to a pain stimuli (Mauk, 1993; Tuchman & Rapin, 1991).

Verbal and non-verbal communication tends to be limited or non-existent and approximately 50% of patients do not acquire spoken language. Their language is often repetitive and does not correspond to context, demonstrating lack of comprehension (Whitehouse, Barry, & Bishop, 2008).

It has been well documented that many children with ASD exhibit fears of unknown origin (Howlin et al., 1973; Jackson & King, 1982; Love, Matson, & West, 1990; Luiselli, 1978) and these fears may be related to the difficulty of dealing with visual and auditory stimuli (Hemsley, 1978). Therefore, patients with ASD are at an increased risk for many systemic conditions (Volkmar, Klin, Schultz, & State, 2005).

Nowak, Casamassimo and Slayton (2010) stated that locating practitioners who are capable of providing care for patients with ASD is especially difficult, and Kopel (1977) indicates that this problem occurs because practitioners find it time-consuming. However, approximately 60% of dentists said they offer special arrangements for children with ASD, but only 8% said they have a special office setup for these patients (Weil & Inglehart, 2010).

The aim of this paper is to recognize obstacles that patients with ASD and their caregivers encounter in getting dental care, as well as to present different techniques that can be used in dental setting in order to help people with ASD overcome those obstacles.

## **METHOD**

The Serbian Library Consortium for Coordinated Acquisition–KoBSON, as well as Google Scholar Advanced Search were used when reviewing the literature. The literature was searched using the keywords: autism spectrum disorder, dental care for patients with ASD, techniques used in dental care of patients with ASD, obstacles in dental care for patients with ASD.

### **Difficulties in dental setting for people with autism spectrum disorder**

Children with ASD are more likely to have a variety of medical and psychiatric conditions requiring frequent physician visits for preventive, non-emergency and emergency care and are on high medication usage (Gurney et al., 2006). Studies show that dental care remained the most prevalent unmet healthcare need for this population (Iida & Lewis, 2012; Lewis, 2009; Lewis et al., 2005) and as far as 25 % of parents experienced difficulty in accessing dental care for their child with ASD (Marshall et al., 2010). Estrella (2013) emphasises that some parents may be reluctant to communicate their concerns in view of difficult experiences they have encountered accessing other services.

Many children with ASD have poorer oral health than neurotypical children (Brickhouse et al., 2009; Kopycka-Kedzierawski & Auinger 2008; Nelson et al., 2011) and high prevalence of dental trauma (Du et al., 2015), therefore they have a lower hygiene level (Lowe & Lindemann, 1985) and greater prevalence of dental disease (Bloom, Cohen & Freeman, 2011; Surgeon General, 2000; Committee of Oral Health, 2011).

Some authors claim they do not possess the manual dexterity to perform effective tooth-brushing (Lowe & Lindemann, 1985), others claim that dislike of the toothpaste taste, as well as the feeling of the toothbrush may compromise the effectiveness in removing the dental plaque (Stein, Polido, Mailloux, Coleman, & Cermak, 2011). Also, young and non-institutionalized patients with ASD are said to have better oral hygiene than those who are institutionalized, because home-stay patients have their parents to brush their teeth and young children were easier to manage, because of their smaller body size (Lowe & Lindemann, 1985). Also, there is a significant role between the parents' dental hygiene and childrens' oral health (Barker & Horton, 2008).

It was noted that parents frequently avoid taking their child with ASD for routine examinations because of the children's fear of dental procedures (Howlin & Rutter, 1987; LaCamara & LaCamara, 1987; Luscre & Center, 1996), or difficulties in locating a practitioner willing to provide care (Nelson et al., 2011), or due to the difficulty to locate a dentist specialized to treat such individuals (DeMattei, Cuvo, & Maurizio, 2007; Glassman et al., 2005; National Institute of Dental and Craniofacial Research, 2009). On the other hand, pediatric and general dentists reported that they received little or no training in their predoctoral dental education in treating patients with ASD (Weil & Inglehart 2010), which explains their unwillingness to provide this kind of necessary care to persons with ASD (Siegal, 1985). Wolff et al., (2004) reported similar findings: 50,8% of dental students had no clinical experience in caring for patient with ASD or related intellectual/developmental disabilities, and 60% reported having little or no confidence in providing care to this population. The main challenge to the dental team may be the reduced ability of these patients to communicate and relate to others (Kamen & Skier, 1985; Kasahara, 1985). Therefore, it has been reported that as low as 10% of practitioners treated children with disabilities on a regular basis (Casamassimo et al., 2004), and they also do not have necessary skills to discuss family members' concerns (Friedlander et al., 2006; Green & Flanagan, 2008; Waldman, Perlman, & Wong, 2008).

The problem is therefore dual, so the caregivers of persons with ASD avoid taking them to the dentist, as well as dentists who are rarely willing to provide care for persons

with ASD. The ultimate result is the finding of Marshall et al., (2010), where he reported that ASD may be considered an indicator for high caries risk, with oral hygiene being the most influential risk indicator associated with new caries in children with ASD.

### **Obstacles in getting proper dental care**

By reviewing the literature, the main obstacles in getting proper dental care for persons with ASD and their caregivers were stated to be individual characteristics of people with ASD, sensory difficulties, unfamiliar environment and lack of dental staff training in treating people with ASD.

For many children with ASD, going to the dentist is a stressful event (Cohen & Donnellan, 1987; Howlin & Rutter, 1987; ) and it is well known that for persons with ASD, medical and dental treatments are often extremely difficult to tolerate (Luscre & Center, 1996), therefore they can offer a limited collaboration to any procedures (Davitt et al., 2011) and show avoidance behaviour during the oral assessment (DeMattei et al., 2007).

The results of a survey done on parents of children with ASD showed that 77 % of their children were frightened and uncooperative at their initial visit to the dentist (Swallow, 1969). Some authors claim that impaired social interaction, communication, cognitive dysfunction and other associated psychiatric symptoms may impede dental care (Barbaressi et al., 2006; Friedlander et al., 2006; Klein & Nowak, 1998; Pilebro & Backman, 2005), but others (Brickhouse et al., 2009; Lewis, 2009) claim that the child's behavior was found to be a major barrier. Therefore, Marshall et al., (2010) concluded that behaviour and life factors are associated with increased dental risks.

These persons can be challenging to treat in a typical dental setting due to their often inappropriate behavioral patterns (Davila & Jensen, 1988) and Brickhouse et al., (2009) showed that children with ASD who exhibit problematic behaviour are less likely to have regular dental care. Moreover, cognitive dysfunction, the presence of aggressiveness, convulsions and other associated symptoms, reduce the possibility of being treated (Friedlander et al., 2006).

Going to the dentist is among the most challenging types of health care for persons with ASD, because of sensory inputs, such as loud or unusual sounds, strange smells, bright lights and having instruments in the mouth (Stein, Polido, & Cermak, 2013) and Baranek et al., (2006) found that 69% of people with ASD can have problems in processing sensory stimuli. Their lack of social and emotional capacity makes it difficult for dentists to explain dental procedures (Addelston, 1959; Swallow, 1969), as well as difficulties in comprehension, and general language impairment (Rapin & Tuchman, 2008). In addition, unfamiliar environment, as the dental environment and modifications in standard daily routines, often lead individuals with ASD to negative behaviours and may generate rage episodes (Howlin, 1998).

Therefore, these special characteristics often impede the children's ability to cooperate in dental settings (Brickhouse et al., 2009), but also some authors (Casamassimo et al., 2004; Dao et al., 2005; Nelson et al., 2011; Weil & Inglehart, 2010) claim that this is because of the reported inadequate training received by dentists to address such challenges, leading to many dental practitioners being unwilling to treat children with ASD.

### **Techniques of managing those obstacles**

Different authors suggest several techniques that can be used to minimize stated obstacles. Those techniques include sensory adaptations, dental staff trainings, familiarizing with dental setting, Applied behavioral analysis, use of electronic screens, visual supports, auxiliary communication aids and in some cases general anesthesia or physical restraint.

Delli, Reichart, Bornstein, & Livas (2013) claim that sensory stimulation should be minimized, because the dental examination light and the noise of a dental engine may be stressful for people with ASD who have visual and auditory hypersensitivity (Boddaert, Chabane, & Belin, 2004; Rogers, Hepburn, & Wehner, 2003). Also, visits to the dental clinic should be short and wait time minimized (Loo, Graham, & Hughes, 2009; Raposa, 2009), because Lai et al., (2012) reported that 13.8% of patients with ASD experienced difficulties while waiting for dental treatment. The presence of few other patients in the reception area can help to lessen fear and stress. The procedure itself must be well-organized and kept short. Lavish praise at the end help motivate the patient and establish the desired behavior (Burkart, 1984).

Before the actual appointment, some patients should undergo a conditioning process, including several rehearsals in a mock environment to familiarize them with the upcoming event (Kopel, 1977; Luscre & Center, 1996), also they should make their first visit to the dentist around the age of one (Aličić, 2016). Hernandez and Ikkanda (2011) suggest that it is important for dentists to organize home-centered preparation before the actual appointment, where a person with ASD would get familiarized with dental instruments and taught the required skills for the dental examination, as well as developing custom-made photo books to assist the person with ASD to get acquainted with the dental operatory room.

Delli et al., (2013) recommends that dentists must have a deep understanding of ASD and the flexibility to modify their approach to meet the needs of the patient. Also, working with the same dentist and staff and having the parent accompany the person with ASD are also helpful practices (Marshall, Sheller, Mancl, & Williams, 2008), because generally, patients with ASD are more capable of tolerating procedures that are expected and predictable (Kuhaneck & Chisholm, 2012).

Applied Behaviour Analysis is the branch of psychology that through the analysis of the relationship of behaviour and the environment intends to modify behaviours to achieve desired effects (Hernandez & Ikkanda, 2011). Behavioural strategies have been used to teach children with ASD to be compliant with medical and dental procedures (Ghuman, Cataldo, Beck, & Slifer, 2004; Shabani & Fisher, 2006), as well as increases tolerance to them (Delli, Reichart, Bornstein, & Livas, 2013; Hernandez & Ikkanda, 2011).

In order to treat the patient, some dentists are providing dental treatment under general anaesthesia (Escribano-Hernandez et al., 2007; Loo, Graham, & Hughes, 2009), but many of the drugs have systemic side effects (Friedlander, Yagiela, Paterno, & Mahler, 2003; Ganzberg, 2003; Haas, 1999; Hersh, 1999; McEvoy, 2005; Physicians desk reference, 2005; Wynn, Meiller, & Crossley, 2003). It is also noted that caregivers of persons with ASD have greater acceptance of general anesthesia for their child's dental



treatment (Borges, Martins, & Almeida, 2007). Several authors (Lowe & Iedrychowski, 1987; McDonald & Avery, 1994) also suggest physical restraint for patients with ASD.

Some authors claim that other methods that can be used in dental settings are the use of electronic screen (Luscre & Center, 1996), because the preference for electronic often motivates children with ASD (Bernard-Opitz, Sriram, & Nakhoda-Sapuan, 2001; Charlop-Christy, Freeman, 2000; LeBlanc et al., 2003). Also, mobile devices can help people with ASD in their daily life activities (Santarosa & Conforto, 2015), as well as motivate compliance with an oral hygiene routine (Underwood, Birdsall, & Kay, 2015).

In 1999 a study was performed to evaluate the use of visual supports to introduce dentistry to children with ASD (Backman & Pilebro, 1999). After 18 months, most of the parents found maintaining good oral hygiene easier than they had found it before the study, because it takes advantage of the ability of persons with ASD to make better contact to pictures instead of words (Backman & Pilebro, 1999). Auxiliary communication aids such as the Picture Exchange Communication System (PECS), can also be useful and can be brought to the dental visit (Bondy & Frost, 1994; Isong et al., 2014; Raposa, 2009).

## CONCLUSION

Caregivers of persons with ASD have difficulties in locating a practitioner willing to provide care, because they received little or no training in their predoctoral dental education in treating these patients.

Some authors claim that impaired social interaction, communication, cognitive dysfunction and other associated psychiatric symptoms may impede dental care and also these patients can be challenging to treat in a typical dental setting due to their often inappropriate behavioral patterns.

Techniques that can be used to improve dental care of patients with ASD are minimized sensory stimulation, short visits to the dental clinic and minimized wait time. Some advise several rehearsals in a mock environment to familiarize them with the upcoming event, as well as working with the same dentist and staff. Also, the presence of few other patients in the reception area can help to lessen fear and stress.

Behavioural strategies can also be used, electronic screen, visual supports, Picture Exchange Communication System. If all of the above does not give results, dental treatment can be provided under general anaesthesia, or physical restraint.

It is important for dental technicians to have proper training in providing dental care for these patients during their University studies, as well as to adjust used techniques, because of individual differences of the patients with ASD.

In conclusion, we give recommendations for University school of dentistry to involve treating people with ASD in their practical aspects of studies, as well as educate prospecting students in using some of the stated techniques. Also, we believe it is necessary to conduct further research on obstacles people with ASD and their caregivers face while going to the dental office in our region.

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