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Knowledge about Management of Down's Syndrome Children in Dental Clinic

J.Chandrapooja
Graduate student Saveetha Dental College
Saveetha Institute of Medical and Technical Sciences, Saveetha University Chennai, India

Dr.Ganesh Jeevanandan
Reader, Saveetha Dental College
Saveetha Institute of Medical and Technical Sciences, Saveetha University Chennai, India

Abstract

Background: Down syndrome, a chromosomal anomaly in chromosome 21 and was the first chromosomal anomaly detected in the human species. Those affected by the syndrome may present various alterations. Oral health is an important aspect for social inclusion of persons with disabilities. Oral diseases and oral malformations rarely result in risk of death, but they cause conditions of pain, infections, respiratory complications and masticatory problems. It is imperative that the dentists be aware about the diagnosis of signs and symptoms inherent to these patients and the possible complications that may arise. The treatment demands the work of a multi-professional team that must stay in communication in order to provide better treatment, associated with the participation of family members, in order to improve quality of life for these individuals.This research article deals with the knowledge about the management of Down's syndrome children in the de! ntal clinic and updates on the recent articles on down's syndrome.

Materials And Method: A questionnaire based study consisting of 15 questions and was distributed among local population. The sample size was 50. The research was done among the dental undergraduate students in Chennai.

Result: From the survey we come to know that more than 90% dental students were aware of oral galvanism but nearly 70% of the students were not aware of adverse effects and some specific conditions in oral galvanism.

Conclusion: It is necessary for a dental student to be aware of adverse effects of oral galvanism and some specific conditions so that they will be able to diagnose and treat patients with rare and idiopathic condition better.

Keywords: Down's syndrome,multi-professional, mastication ,imperative,malformations

INTRODUCTION

Approximately one out of every 800-1,100 births results in an extra chromosome of the twenty first group called Trisomy 21, or Down syndrome. Affecting over 250,000 people in the U.S. alone, this population has progressed tremendously over recent years to be able to function in the mainstream of society. Inclusive school, work and community settings are now becoming the norm for persons with Down syndrome. This has resulted in a higher level of functioning for most of these individuals with resulting increases in self-esteem and self-image. The demand for dental care in persons with Down syndrome is increasing with this inclusive trend. Most dental treatment for persons with Down syndrome can take place in a general dental office with relatively minor adaptations. In undergraduate dental training there is usually little or no exposure to treating patients with disabilities, and general practitioners may be hesitant to treat these patients with confidenc! e. This paper will attempt to summarise the unique characteristics associated with Down syndrome that influence the dental care and treatment of this population.

Down syndrome is commonly seen in coincidence with other medical problems. There is a higher incidence of epilepsy, diabetes, leukaemia, hypothyroidism, upper respiratory tract and chest infections and other conditions.[1]

Oral disease is a major health problem for individuals with disabilities, who have a higher prevalence and severity of oral disease compared to the general population. High rates of dental caries, missing teeth, periodontal disease, prolonged retention of primary teeth, misaligned or supernumerary teeth and malocclusion are all indicators of poor oral health in adults with disabilities.[2] The precocious nature of the condition is thought to be due to such factors as immunological deficiency, poor oral hygiene, fragile periodontal tissue, early senescence, and poor masticatory function,! while it is also likely that short tooth roots lead to tooth ! mobility and subsequent loss.[3]

ETIOLOGY

Majority of cases the error occurs during maternal oogenesis particularly at meiosis I (MI).[4,5] The process of oogenesis is lengthy and involves meiotic arrest, which makes it more vulnerable to malsegregation of chromosomes than spermatogenesis.[6] Moreover, with increasing age, there is rapid degradation of cellular proteins involved in spindle formation, sister chromatid cohesion or anaphase separation of sister chromatids in oocytes, which imposes the risk of NDJ both at MI and MII.[7,8] Recombination, initiated in the fetal ovary, stabilizes the tetrad and ensures proper segregation of chromatids to opposite poles. But the process is random and may be absent even in euploid samples [9]. These achiasmate meioses are at risk for NDJ, and this risk increases with age due to rapid deterioration of ovarian proteins that make up the surveillance and `back-up' system for resolving and separating these non- exchange chromosomes [10]. It has been shown that no! ndisjoined

chromosomes often show altered patterns of recombination and for trisomy 21, achiasmate meioses contribute about 45% of maternal MI cases [5]. Therefore, the ovarian microenvironment of older women appears to become more error prone due to accumulation of environmental and age related insults [11]. Combining these findings, it has been postulated that chromosomal NDJ is a complex and multi-factorial event for which the underlying mechanisms are related to two different sets of factors; one age dependent and another age independent [6].

OROFACIAL FEATURES

The primary skeletal abnormality affecting the orofacial structures in Down syndrome is an underdevelopment or hypoplasia of the midfacial region. The bridge of the nose, bones of the midface and maxilla are relatively smaller in size. In many instances this causes a prognathic Class III occlusal relationship which contributes to an open bite. Absence or reduction in size of the frontal and maxillary sinuses is common.[12]

TOUNGE AND LIP

Common oral soft tissue features of DS individuals include large and fissured tongue and cracked lips. Studies have revealed that the tongue size does not vary significantly from that of the general population. It is the small size of the oral cavity which gives the illusion of macroglossia [13,14]. Due to the poor muscular control, the tongue is often protruded. Generalized hypotonia of the orofacial muscles e.g. orbicularis, zygomatic, masseter and temporalis muscles enhances the improper oral seal, poor suckling, poor tongue control and jaw instability. Tongue presents with bilateral, unilateral or isolated oval depression and with a raised white scalloped border. This usually is caused by frictional movement against teeth, diastema, tongue thrusting, tongue sucking, clenching or enlarged tongue [15]. Though geographic and fissured tongue seen in DS individuals is asymptomatic, it may cause food impaction and subsequently halitosis. [16]

PERIODONTIUM

People with Down syndrome are at an increased risk for gum disease (periodontal disease). Even when individuals with Down syndrome do not have a lot of plaque and tartar (calculus), they get periodontal disease more frequently than others. This is because people with Down syndrome have an impaired immune system and do not have some of the natural protections against the disease that people without Down syndrome have. To prevent gum disease brush twice daily, focusing the bristles along the gum line, floss daily and be sure to visit the dentist regularly to have gum health monitored and to take X-rays to monitor bone levels. If the gums bleed that means that they are inflamed. Brushing and flossing should not be stopped because of this. In fact, brushing and flossing will keep the gums clean and help to minimize the inflammation.[17]

MIDFACIAL COMPLEX AND PALATE

The development of the whole craniofacial complex is retarded and the facial profile is relatively concave. The maxilla is deficient in development while the mandible is of normal size or slightly hypoplastic [18]. The deficiency in the vertical height of the maxilla results in overclosure of the mandible and thus projects the lower arch forward relative to the upper [19]. Such patients show significantly higher frequency of shelf-like or "stair palate" [20]. Westerman et al. [21] compared 40 DS individuals with 44 control subjects and concluded that the palatal dimensions were narrower in width, shorter in depth and lower in height.

TOOTH

DS individuals presented with true generalized microdontia in permanent dentition, but in primary dentition this is not well documented [22,23]. Clinical crowns are frequently conical, short and small [24,25]. Bell et al. examined the lower incisors dimension and found that the reduced permanent crown size was linked with a reduction in both enamel and dentine thickness [26]. All teeth except the upper first molars and lower incisors were reduced in size, with complete root formation. Peg-shaped lateral incisors, shovel incisors and slender canines were frequently seen [27,28]. Another common finding in DS individuals is delayed eruption of primary and permanent teeth.

MANAGEMENT

Treatment objectives for any population with developmental disabilities should be the same as that of normal patients. Treatment plans may need to be adapted as necessary due to each individual's condition, but the overall goal should be to provide as comprehensive treatment as possible. Areas of dental care such as cosmetic dentistry, orthodontics, prosthodontics, and reconstructive oral surgery should not be ruled out simply because the patient has Down syndrome. With the numbers of persons with Down syndrome working and living out in the community, there may be many who desire and can handle some of the more extensive dental treatment options available today.

BEHAVIOURAL MANAGEMENT

Good behavior in the dental office is learned. In a population with delayed learning, this can be a challenge for the dentist and staff. Dental treatment for children with Down syndrome may not be sought out at an early age. There may be more pressing medical problems, financial considerations or parents may want to wait until the child seems mature enough to handle a visit to the dentist. Unfortunately this makes it more difficult to teach proper home care and to develop a relationship with the child that will result in co-operative behavior during dental treatment.[29]

Determining the level of communication is very important in developing a co-operative relationship with your patient with Down syndrome. The level of receptive vs. expressive language may not be the same. The patient's

family or caregiver will be able to guide the dental staff as to what level of communication is appropriate.[30]It is important that the dentist communicate directly with the patient whenever possible in order to build a level of trust. It may be advantageous to have a parent in the operatory during some early childhood visits. Finding out what motivates the child with Down syndrome is also important. Something as simple as receiving a pair of gloves and a mask at the end of the appointment may be all it takes to ensure co-operation. With more difficult patients requiring more extensive treatment, premedication and/or restraints may be necessary. However, most patients with Down syndrome can handle routine dental care with just a little more time and attention given during the appointment.[31]

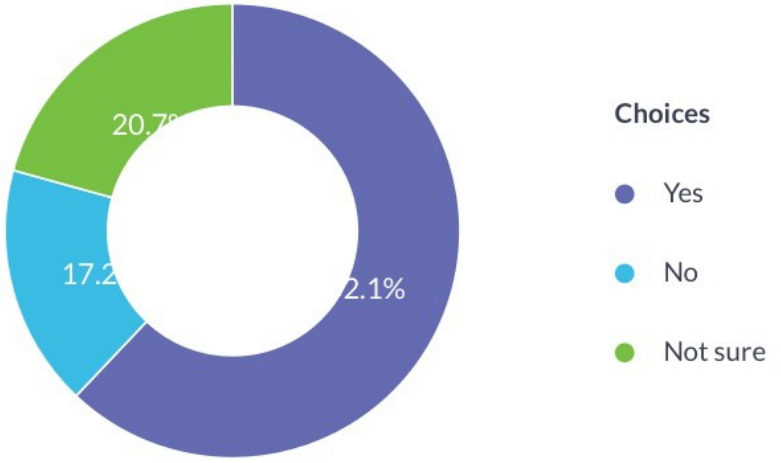
Scheduling appointments early in the day is beneficial as both patient and operator are more rested. First appointments should be for orientation only, and subsequent appointments may require a little more time than what is usually allowed. The patient's medical history should be obtained prior to the first appointment. This allows for medical consultation if necessary before any treatment begins.[32]

MATERIALS AND METHODS

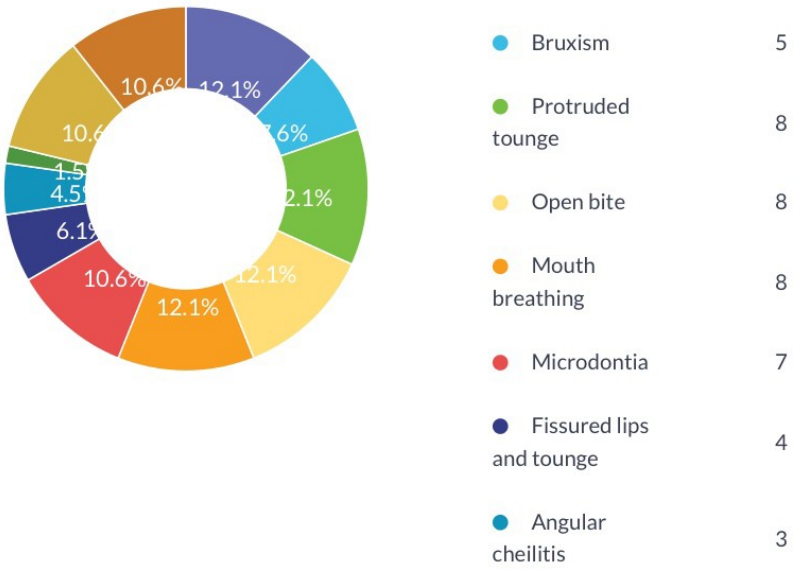
A questionnaire based study consisting of 15 questions and was distributed among local population. The sample size was 50. The research was done among the dental final year students in chennai.In this survey there were no right or wrong answers and no time limit was given to them. The people were asked to answer only the questions which they know or only the questions which they can understand and the remaining questions were asked to skip. After the completion of questions by the people the responses were interpreted in accordance with the norms.

RESULT

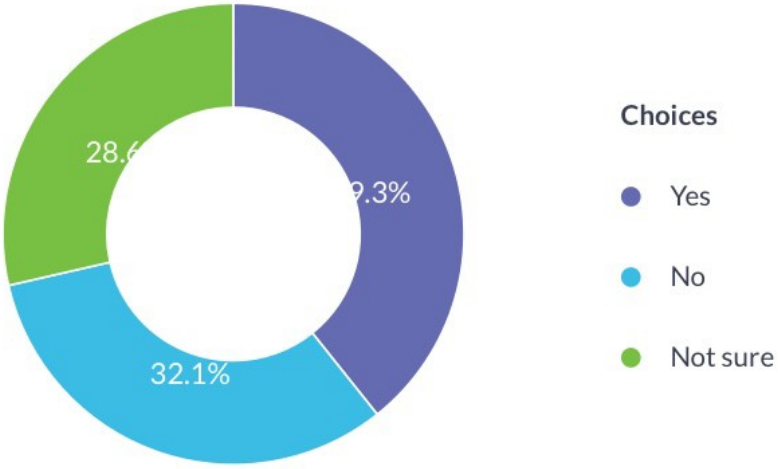
Do you know the causes of Down's syndrome?



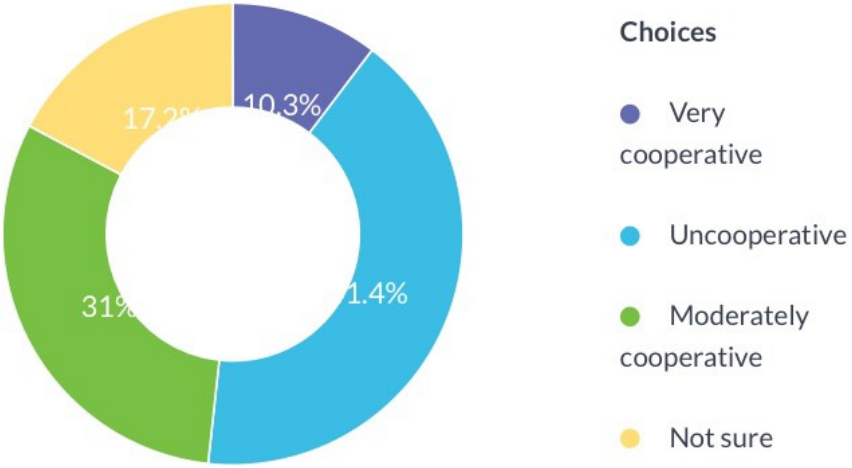
what are the oral manifestations of Down's syndrome?



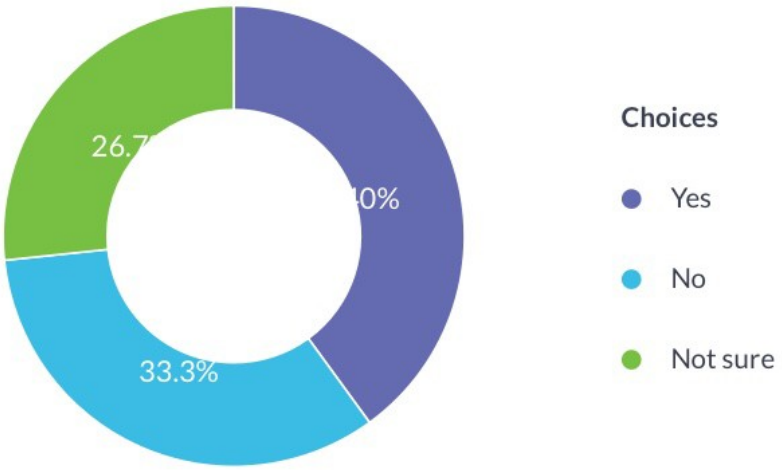
Are you aware of the methods of clinical management of Down's syndrome children?



what do you think is the metal attitude of Down's syndrome children towards the dental treatment?



Do you know the eruption and shedding pattern in Down's syndrome children?



DISCUSSION

There are certain ways to effectively manage down's syndrome children in the dental clinic

•Plan a pre-appointment (in person/ phone) to discuss patient special needs prior to the first visit. Discuss this with the parent or care provider-they know the child best.

- Schedule appointments early in the morning or best time of day for patient.
- Talk with the parent or caregiver to determine the patient's level of intellectual and functional abilities and explain each procedure at a level the patient can understand.
- Use short, clear instructions and speak directly to the patient.
- Minimize distractions, such as sights and sounds, which may make it difficult for the patient to cooperate.
- Start the oral examination slowly, using only fingers at first. If this is successful, beginusing dental instruments.
- Use the Tell-Show-Do approach when introducing new instruments or procedures.
- Reward cooperative behavior with positive verbal reinforcement.
- Develop trust and consistency between the dental staff and the patient.

Dental Treatment And Prevention:

- Consider patient's cardiac status and need for premedication-medical consult may be indicated
- It is not uncommon to encounter patients who are tube-fed among the population of Children with Special Healthcare Needs. Patients fed by tube typically have low caries, rapid accumulation of calculus, GERD (Gastro-esophageal Reflux Disease), oral hypersensitivity, and are at high risk for aspiration in the dental chair. No antibiotic premedication is needed for Gastric or Nasogastric tubes. Position the patient in as upright a position as possible and utilize low amounts of water and high volume suction to minimize aspiration.
- Examine patients by the first birthday; monitor tooth eruption patterns and malformations.
- Monitor periodontal disease. Treat as needed and consider specialty referral if indicated.
- Powered toothbrushes may be too stimulating for some children and should be recommended only after determining if the child will tolerate one.
- Consider prescribing Chlorhexidine or other antimicrobial agents for daily use.

CONCLUSION

This experiment was conducted to know the percentage of awareness on management of Down's syndrome children among dental students. In this questionnaire questions about behaviour of the children,caries prevalence,preventive methods fluoride and CHX mouth were also included. From this study we come to a conclusion that more than 90% of dental students were aware clinical and dental manifestations of the condition and the diagnosis but were not aware of the behavioural management and the treatment options.To summarize, the dental students are should gain more knowledge specific conditions, preventing methods for treatment of caries and the dental and medical complications the condition can be treated efficiently.

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