INTRODUCTION

Epilepsy is defined as a brain disorder characterized by an enduring predisposition to generate epileptic seizures ***(Blume et al., 2005)***.

There are different types of epilepsy and seizures. Epilepsy drugs are prescribed to control seizures, and rarely surgery is necessary if medications are ineffective ***(Fisher et al., 2005)***.

The diagnosis of epileptic seizures is made by analyzing the patient's detailed clinical history and by performing auxillary tests for confirmation. Physical examination helps in the diagnosis of specific epileptic syndromes that cause abnormal findings ***(Goodkin et al., 2007)***.

Epileptic children are at an increased risk of developing caries and gingivitis compared with healthy subjects ***(Gurbuz et al., 2010)***.

Xerostomia, gingivitis and gingival over growth was seen as common side effect of the antiepileptic drugs. Few children even had glossitis ***(Robbins et al., 2009)***.

Gingival over growth was seen as a common side effect of the Antiepiletic drugs in 46% of patients. Presently, the etiology of drug-induced gingival overgrowth is not clear but it is multifactorial. Also, the effect of age, sex, duration and

dosage of the drug in the pathogenesis of gingival overgrowth is not clearly understood ***(Miranda et al., 2001)***.

Levetiracetam is an anticonvulsant used in combination with other medications to treat seizure disorders (epilepsy). Levetiracetam has been shown to decrease the number of seizures in adults and children ***(*Cereghino *et al., 2000)***. Levetiracetam has been approved in the European Union as a monotherapy treatment for epilepsy in the case of partial seizures, or as an adjunctive therapy for partial, myoclonic and tonic-clonic seizures ***(Noachtar et al., 2011)***. Common oral side effects associated with Levetiracetam include headache, dry mouth, glossitis, gingival inflammation ***(Andermann et al., 2008)***.

Topiramate is used alone or with other medications to treat certain types of seizures including primary generalized tonic-clonic seizures and partial onset seizures. Gingival hyperplasia and gingivitis are both reported as side effects of Topiramate. Both of these conditions can lead to tooth decay ***(Skirrow et al., 2014)***.

AIM OF THE WORK

Screening for gingival enlargement and dental caries in a Cross sectional study of children with epilepsy treated by Levetiracetam and Topiramate.

ORAL HYGIENE IN NEURODEVELOPMENTAL DELAYED CHILDREN

Children with neurodevelopmental disabilities and other special health care needs are at increased risk for oral problems. These include: common oral diseases such as caries and periodontal disease; serious health consequences from common oral disease due to underlying medical conditions; oral consequences of medical therapies; and less common oral and craniofacial problems that also affect their overall health, quality of life, and long-term outcomes. Children with neurodevelopmental conditions may be at special risk for oral disease due to delays in acquiring self-care skills, knowledge, and understanding needed to promote oral health ***(Slavkin et al., 2012).***

Children with neurodevelopmental disabilities and other special health care needs to face barriers to care for many reasons, including critical dental provider workforce shortages and geographical maldistribution of providers, a lack of dental professionals trained in the care of children and special populations, and a lack of medical and other health practitioners trained in oral health promotion. In addition, many of these children lack oral health coverage, especially for complex oral and craniofacial care ***(Stoopler et al., 2009).***

Moreover, dental and medical systems operate separately, undermining the broader vision of interdisciplinary, integrated services for these children. Finally, systems of care do not always work collaboratively with parents and social service and educational systems serving children and families ***(Waldman et al., 2001).***

A comprehensive child-specific definition of medical necessity takes into account developmental, health, social, cultural, family, and environmental factors affecting children, and it includes oral health and preventive therapies as part of overall health care. Such health coverage is needed for all children, including those with special health needs ***(Chaushu et al., 2000).***

There are critical gaps in the evidence base needed to promote the oral health of these children and in the application of new science and technologies to their care. There is insufficient attention to important related areas such as nutrition, speech, oral-motor function, quality of life, oral-systemic health interactions, and development of healthpromoting behaviors ***(Newacheck et al., 2000).***

Interventions must emphasize prevention and health promotion. Despite data gaps, there is good reason to believe that most oral disease could be prevented in these children. Current understanding of disability and health promotion dictates that actions extend beyond individual and professional interventions and address societal determinants of health. This

is particularly important for individuals with neurodevelopmental disabilities, who are disadvantaged in a system that relies heavily on personal skills and access to professional care that may be limited. With improved survival of individuals with neurodevelopmental disabilities and other special health care needs, oral disease prevention must be a priority ***(Grossman et al ., 2011)***.

Interdisciplinary efforts can help promote oral health of children with special needs. These challenges call for changes in professional training, research in special populations, integration of health services, and policy strategies to promote oral health. Collaboration with families, health care providers inside and outside of dentistry, professional societies, policy makers and other partners is needed to accomplish these changes ***(Deyo et al., 2011)***.

Existing resources and opportunities include the interdisciplinary training and research centers in mental retardation and developmental disabilities, model programs such as Special Olympics, Special Smiles, and concurrent state, regional, and national activities. Given their unique focus and scope of activities, the Health Resources and Service Administration's Maternal and Child Health Bureau-funded centers for leadership education in neurodevelopmental and related disabilities (LEND) and pediatric dentistry should take leadership roles in seeding needed changes in training, research, services, and policy for these children ***(Genco et al., 2012).***

Recommendations:

I. Provide optimal education and training for families, health professionals, and the public *(Becker et al., 2000) by:*

1- Educate families and all health professionals in oral health promotion and disease prevention and oral-systemic health interactions for children with neurodevelopmental disabilities and other special health care needs.

2- Educate dental professionals in maintaining a broad view of child health, including developmental, family, social, cultural, and environmental determinants of health.

3- Educate health professionals and families in oral health promotion through community and system level actions, advocacy, and policy change.

4- Increase opportunities for interdisciplinary collaboration between health professionals including dental, medical, nursing, nutrition, pharmacy, public health, and others.

5- Use leadership training programs in neurodevelopmental disabilities (LEND), pediatric dentistry and others to promote critical changes in education, training, research, service, policy for children with neurodevelopmental disabilities, and other special health care needs.

6- Garner support of professional organizations and certifying and licensing bodies for needed educational and training changes.

7- Expand awareness of the importance of oral health among policy makers, program administrators, and the public with consistent messages and targeted communication.

8- Evaluate effectiveness of educational programs for families, professionals, and the public

II. Foster research and translation of science *(Horowitz et al., 2001) by:*

1- Expand research agendas in oral health for children with special health care needs, including epidemiological, health services, clinical, behavioral, and oral-systemic health linkages.

2- Enhance translation of science of caries prevention and other discoveries to care for children with special health care needs.

3- Consider national consensus conferences in critical areas: nutrition and oral health; health promotion; quality of life; and oral health promotion in special populations.

4- Support behavioral and education research on the best ways to accomplish training objectives for professionals and families.

III. Create integrated service models and demonstration projects *(Kerker et al., 2001) by:*

1- Ensure children with special health care needs have dental homes, medical homes, and needed interdisciplinary care that integrates oral and general health.

2- Individualize treatment for each child and family, including oral health perspective.

3- Include oral health evaluations as part of comprehensive EPSDT (early and periodic screening, diagnostic and treatment) exams and develop guidelines for such assessments.

4- Ensure presence of integrated dental and oral health services at children's hospitals and tertiary care centers.

5- Reach out to children and families across other systems, especially in neurodevelopmental centers; use interdisciplinary providers and allied dental professionals such as dental hygienists to integrate oral health care in diverse settings.

6- Ensure outreach, case management, and other enabling services for children with special health care needs to ensure children receive needed oral health care.

7- Ensure cultural competency of systems and providers relating to children and families with special needs.

8- Develop demonstration projects in oral care of children with special needs.

9- Ensure transition of adolescents with special health needs to adult health care services.

IV. Support critical policy change and standards of care *(Owens et al., 2001) by:*

1- Ensure health insurance coverage for all children including those with special health needs.

2- Develop child-specific definitions of medical necessity that include oral health care and hold health systems accountable to standards.

3- Develop incentives that encourage dental professionals to work with children with special health care needs.

4- Develop a comprehensive oral health promotion policy agenda.

5- Consider policies that facilitate adolescent transition to adult health care services.

V. Use partnerships to address oral health disparities in children with special health needs *(Zigler et al., 2001) by:*

1- Ensure participation of families to promote oral health training, service, and research and policy agendas for these

populations of children. Include culturally diverse perspectives.

Disparities in oral health of children with neurodevelopmental disabilities and other special health care needs:

Although it is known that profound disparities exist in the oral health of children from low income and minority families, no national database exists to document oral health status of children with neurodevelopmental disabilities or other special needs. Clinical accounts and emerging data attest, however to increased risks of oral disease in children with special health care needs, and individuals with neurodevelopmental disabilities in particular, as discussed by ***Hughes et al. (2001)***.

Dental care is the most prevalent unmet health need among all children and among children with special health care needs. Programs for children with special health care needs that assessed provider capacity for this population, access to dental care received the lowest scores, with no state reporting adequate access for this population ***(Raymer et al., 2001).***

A recent survey of academic pediatric dental departments, which serve as safety nets for children with special health care needs, revealed many are overburdened,

with waits of up to seven months for operating room time ***(Hughes et al., 2001)***.

Barriers included lack of dentists with pediatric expertise in managed care networks, shortage of and geographical maldistribution of dentists, linguistic and cultural barriers, inadequate reimbursement, and restrictive interpretations of "medical necessity." Inadequate access to pediatric dental care under Medicaid has been previously documented. This situation could have a greater impact on children with special needs, because a disproportionate number of them are covered by Medicaid or other form of public insurance. In addition, the consequences of lack of care may be more profound because these children's oral needs are greater than average. Poor and near-poor families of children with developmental disabilities are more likely to report unmet dental needs due to cost barriers than similar families of children without disabilities ***(Hughes et al., 2001)***.

Chronic access problems for individuals with developmental disabilities in both community and institutional settings are explored in papers by ***Kanellis and Cheffetz***. They identify barriers at system, provider, family, and individual and child levels. Gaps in training. The shortage of dental providers available to treat these children is discussed by ***Nowak and Casamassimo (2000)***. Historically, the burden of care for these children has fallen on a disproportionately small groups of

dentists, primarily pediatric dentists. General dental undergraduate curricula are lacking in this area.

At the same time, training of medical professionals in children's oral health promotion has lagged. A recent national oral health survey of pediatricians demonstrates a lack of training and knowledge in oral health, but recognition of its importance. In the area of knowledge of craniofacial conditions, both medical and dental providers have demonstrated knowledge gaps ***(McManus et al., 2001)***.

There is also a lack of evidence to support the efficacy of many clinical interventions in special populations, ***Nowak and Casamassimo*** conclude from a review of the literature. There are almost no baseline data on caries experience, prevalence of untreated caries in children and adolescents with disabilities.

The prevalence of various oral conditions in specific sub-groups of children with special health care needs must be better defined to confirm clinical reports. There are research gaps in health services and oral-systemic health linkages for special populations. The resources devoted to the study of oral health of special populations have not been adequate. Specific health promotion and other research gaps are noted by ***Crall and Braveman, (2000)***.

Gaps in financing of services and policy:

Low reimbursement rates for children insured by Medicaid, a lack of coverage for general anesthesia, and the complex and time-consuming nature of oral health care for children with special needs all contribute to access problems. For pediatric dentists, most of whom already see children with special needs, the financial gap between private practice and academic or hospital employment limits the number specializing in this type of care ***(Nowak et al., 2002).***

These factors have a critical impact on pediatric dental service, training, and research capacity in academic settings. Furthermore, pediatric dentists often follow these children into adulthood, further limiting their availability to accept new children with special needs. The most obvious policy gap is the lack of affordable health coverage for all children. Lack of health insurance is the single largest risk factor for unmet dental needs ***(Anderson et al., 2000).***

Moreover, most health and dental insurance plans do not provide adequate coverage for specific oral therapies needed by children with neurodevelopmental disabilities and other special health care needs that might include oral-facial surgeries, orthodontics, dental implants and prosthetics, oral appliances, special nutritional interventions, and oral-motor therapies including speech therapy ***(Slavkin et al., 2012).***

Another gap is the failure to ensure that all Medicaid-eligible children, especially those with special health care needs, access the preventive and therapeutic dental care to which they are entitled. Finally, more widespread modification of current policy is needed to support expanded use of allied dental and primary care medical practitioners to deliver needed oral health promotion interventions in vulnerable populations, as is now possible in some states. Policy changes could include reimbursement for oral services by these practitioners and relaxation of state dental practice laws ***(Slavkin et al., 2012).***

Interdisciplinary training opportunities

Concurrent with these startling needs are important opportunities for integration of oral health into interdisciplinary health professional training and research centers ***(Feldman et al., 2001).***

Since 2000, the federal Maternal and Child Health Bureau (MCHB), Health Resources and Services Administration, has required competitive applications for Leadership Education in Neurodevelopmental and Related Disabilities (LEND) program funding to include pediatric dentistry as a core discipline along with pediatrics, nutrition, occupational and physical therapy, speech and language, and others. In addition, MCHB funds two centers for Leadership Training in Pediatric Dentistry and has called for applications for additional centers ***(Feldman et al., 2001).***