INTERNATIONAL JOURNAL OF COGNITIVE NEUROSCIENCE AND PSYCHOLOGY

PREVALENCE INDICATORS OF DENTAL CARIOS DISEASES ANALYTICAL INDICATORS

Axmedov Alibek Bahodirovich
Https://Orcid.Org/0000-0003-2830-5423
Olimov Siddiq Sharifovich
Https://Orcid.Org/0000-0002-1142-6838
Bukhara State Medical Institute Named After Abu Ali Ibn Sino. Bukhara, Uzbekistan.
E-Mail: Alibek_Axmedov@Bsmi.Uz

Abstract: Dental caries remains one of the most widespread chronic diseases across all age groups, affecting billions of people globally. Despite advancements in dental care, caries continues to pose a significant public health challenge, especially in regions with limited access to regular dental services. This study investigates the analytical indicators associated with the prevalence of dental caries across various population groups, focusing on both children and adults. By analyzing clinical data, demographic factors, and behavioral patterns, we aim to identify trends, risk factors, and disparities in caries distribution. Our findings show that age, socioeconomic status, dietary habits, and oral hygiene routines all play a critical role in caries incidence. Furthermore, the study provides a comparative analysis across regions and age brackets, offering a comprehensive understanding of how dental caries prevalence can inform better prevention strategies and public health interventions.

Key words: Dental caries, Caries prevalence, Oral health statistics, Risk factors for tooth decay, Epidemiological indicators, Public dental health, Socioeconomic influence, Oral hygiene habits, Dental disease surveillance, Preventive dentistry.

Introduction

Tooth decay, or dental caries, is more than just a common dental problem — it's a global health issue. Although often preventable, it is still one of the most prevalent diseases worldwide, affecting nearly all adults and the vast majority of school-aged children. Understanding how and why dental caries develops — and more importantly, who it affects the most — is crucial for both clinical dentistry and public health planning.

The prevalence of caries doesn't occur randomly. It varies by age, geography, income level, access to healthcare, and even education about oral hygiene. While in some high-income countries, caries rates have declined due to preventive programs and fluoride use, many developing regions still struggle with high and increasing levels of tooth decay. Children, elderly individuals, and low-income populations are often the most affected.

This study aims to provide an in-depth analytical view of the key indicators associated with the prevalence of dental caries. By collecting and examining both quantitative and qualitative data from various communities, we aim to map the landscape of dental caries, uncover patterns, and support evidence-based solutions to tackle this persistent oral health concern.

Methodology

This research employed a cross-sectional analytical study design, involving a sample of 500 individuals aged 5 to 65, across both urban and rural populations. Participants were grouped by age (children, adolescents, adults, and elderly) and stratified by gender, income level, and access to dental services.

The research process was carried out in three stages:

Clinical Examination: Participants underwent oral health screening by licensed dentists using WHO

standardized criteria to detect and record decayed, missing, and filled teeth (DMFT index).

Questionnaire Survey: Participants completed a structured questionnaire that gathered data on dietary habits (especially sugar intake), oral hygiene routines (brushing frequency, use of fluoride), frequency of dental visits, and perceived barriers to accessing dental care.

Data Analysis: The collected data were analyzed using SPSS v.26.0. Descriptive statistics were used to measure overall caries prevalence, while inferential statistics (Chi-square test and logistic regression) were applied to determine the relationship between dental caries and demographic or behavioral factors.

Ethical approval was obtained, and informed consent was collected from all participants (or guardians, for minors). The methodology ensured transparency, diversity of data sources, and statistical rigor.

Results and Discussions

Non-carious diseases of dental hard tissues are widespread among the population of Uzbekistan and other countries of the world. Non-carious diseases of teeth are a widespread group of dental pathologies, which include many nosological forms similar to each other in terms of manifestation and etiological factors [4, 8, 13, 20]. Literature sources indicate that the average prevalence of non-carious diseases among the general population not working in occupationally hazardous industries ranges from 10% to 23%. At the same time, the pathological caries of teeth in the structure of diseases varies from 9.2% to 18.0%. Erosion - 0.9-2.6%, follicular defects - 2.6-5.0%, endemic fluorosis affects from 30.0% to 90.0% of the population in disadvantaged areas [4, 13, 16, 19].

It is known that the Amur Region of the Russian Federation is the most dangerous endemic zone for the occurrence of fluorosis due to the high content of fluoride in natural sources in the world. Thus, in the city of Shimanovsk, Amur Region, the average fluoride content in drinking water is 3.7 g/l, in the Arkharinsky district this figure is close to 4.8 g/l, which indicates a high level of saturation with free fluoride, and accordingly, more than 90% of the population in these regions has various forms of fluorosis [13].

According to some authors, in recent years the prevalence of non-carious diseases that occur after tooth eruption has increased significantly. Thus, non-carious lesions were detected in 74% of patients: enamel erosion in 47.2%, ponasimon defects - 19.3%, pathological tooth decay - 21.8%, hyperesthesia of dental hard tissues - 67.3% [14]. The significant increase in erosion, ponasimon defects and pathological tooth decay, as well as various views on the factors causing these diseases, indicate the relevance of the topic and serve as the basis for this study [1, 6, 7, 9, 14].

The problem of diagnosing, treating and preventing non-carious dental lesions remains one of the most urgent and unresolved problems of modern dentistry [14]. Non-carious lesions are a widespread group of diseases of the dental hard tissues, which include many nosological forms that are similar in their manifestations and genesis [19]. The causes of these diseases are not well studied. There are different views on the pathogenesis of non-carious dental diseases, and evidence is provided in favor of one or another theory of their occurrence.

The problem of diagnosing and treating periodontal defects of dental hard tissues is associated with its widespread occurrence, the lack of unity of views on treatment tactics, and insufficient coverage in the scientific and medical literature. If much attention is paid to the study of dental caries, then only a few publications are devoted to the study of non-carious lesions of teeth in adults [6, 12]. Among non-carious diseases of teeth, a number of clinical forms of these pathological processes and diseases (pathological decay, fluorosis, trauma) have been studied in sufficient detail [1, 5, 6, 12, 26]. Methods of their prevention and treatment have been developed [10, 15]. In the case of other nosological forms of damage to dental hard tissues (erosion, periodontal defects), there are many uncertainties associated with their etiopathogenesis, prevention, and treatment methods. One of these diseases is periodontal defects of dental hard tissues. To date, there are conflicting data on the prevalence of ponasimon defects in the adult population. There are no data on the clinical course and incidence of ponasimon defects in dental hard tissues in the elderly and senile population.

Diagnosis, treatment and prevention of non-carious diseases remain one of the urgent and unresolved problems of modern dentistry. Studies conducted by V.I. Kobeleva show that 10% of the 1000 surveyed residents of Moscow aged 16-60 had non-carious diseases of the teeth. However, according to WHO

(1999), non-carious diseases were detected in 43.5% of 12-year-old adolescents and 41.7% of 15-year-old adolescents.
Studies conducted by scientists show that 50% of children in Western Australia are diagnosed with endemic fluorosis. A.I. Grudyanov , A.G. Kolesnik and according to others (2007) in the Moscow region (Krasnogorsk) fl yu oroz prevalence is 97% does . Teeth of color take antibiotics to change to do both reason to be possible (R. Goldstein, 2003). Yu.A. Fedorova and others (1996, 2005) are recent in years after the eruption of the tooth r to the surface coming and carious diseases spread noticeable to the extent increased emphasized . According to him in 74 % of patients no carious lesions observed , of these enamel erosion - 47.2%, Ponasimon defect - 19.3% of teeth pathological made - 21.8%, tooth hard tissues Hyperesthesia - 67.3 %. O.V. Petrichenko's (2004) said according to, dentine hyperesthesia is up to 60% in patients record importance is paid to the variety of etiological factors.
Other foreigner authors occlusion that falls on the tooth in the origin of tooth-like defects download too much outside height main reason because they count Scientists chewing during jaw system and of the language in the case of the parafunction σ i this process is accelerated, lateral that the effect of loads is clearly felt separately pointed out [18, 21, 27].
Tooth neck in part appearance will be effort little by little hard in fabrics chronic causing stress will release and later this in the field erosion and concavity It will be. decay acid erosion processes with acceleration possible [2, 11, 20, 22, 24, 29].
Modern according to theories, too outside occlusion of goods to the tooth the effect exception without, of abfractions etiology piezoelectric impact as a result enamel prisms no shooting process as explain. Atypical occlusion of the llamas effect under in the tooth bending stress appearance it will be, this and called piezo electric effect the known electrostatic process bringing releases This process as a result calcium ions enamel prisms from the crystal lattice of calcium hydroxyapatite molecules outside is issued . In addition, the electrostatic tension formed in the oral cavity increases the layer-by-layer erosion of enamel surface layers and reduces the remineralizing power of oral fluid [3, 8, 17, 20, 28].
M. Braem [7] believes that defects resulting from pressure on the teeth are more often observed in bruxism, as well as in the frontal teeth of patients who do not have chewing teeth during the bite process. Spectral analysis showed the direction of the stress vectors in the tooth neck area depending on the nature of the applied force. It is noted that the shape of the defect depends on the shape of the stress, and the defect formed under tensile load has a V-shape, and under compression - a C-shape [20].
The occlusion theory of abfraction explains the shape of the defect. The formed defect is deep, with a sharp angle at the base, sometimes extending to the subgingiva [18, 29].
According to the researchers, the defect can be in the form of a step or a barrier and occurs in the cervical part of the tooth. Morphological changes occur in the enamel, since elastic dentin is less susceptible to occlusal stress. The size of the defect depends on the degree of occlusal stress, the duration of the effect of excessive occlusal forces, their direction, frequency and location of application. With prolonged exposure to atypical occlusal forces, along with abfraction defects, abrasive chewing points are formed, which cause parafunctional loads on the tooth [20].
Abfraction may occur with gingival recession, but it is not its only feature - the resulting bending stress causes the epithelial attachment to shift toward the apical part of the tooth [11, 20].
Some authors [17, 23, 25] consider abfraction to be the main cause of the Ponasimono defect. In modern clinical practice, " Ponasimono" defect " and " abfraction " defect " concepts exactly distinction need In this matter occlusion of contacts to the doctor attention is given. Undoubtedly, if the V- shaped disadvantages was in the teeth supercontacts if found out and separately teeth and teeth groups too much outside loaded if so, this in case abfraction about to speak more correct will be Poniform defects are more tooth neck in the field , mainly of the root open in part appearance will be and dentin microhardness low because of the rapid growth in size It will go.
XKT-10 (1997), in section K.03 tooth erosion (K03.2) and of teeth erosion (pony defect) as (K03.1). nokaryosis injuries diagnosis to be placed can Black classification to the 5th grade relevant which is " abfraction defect " separate to the group not allocated, therefore for this your name instead determination need This type nokaryosis injury K03.18 Other specified abrasion of teeth / Teeth other to oneself characteristic decay under classification can However, this of the kind to the flaws attention increase them

independent nosological to forms separation the necessity demand will do.
Since many authors do not consider abfraction as a component of dental hard tissue erosion, there is a lack of sufficient data from clinical and epidemiological studies to date. When analyzing the available literature, we did not find the results of published studies on the prevalence of abfraction defects in different population groups.
In addition, most of the studies did not reach statistical significance due to the small sample size of the respondents. As mentioned above, comparison of published data is problematic due to differences in indicators and terminology.
In 2010, as part of the epidemiological survey of the adult population of the Republic of Belarus, the Department of General Dentistry of the BelMAPO conducted a survey among the population in all regions of the Republic of Belarus and in the city of Minsk. The main age groups of the adult population were examined: 18, 35-44 years old, 65 years old and older. A total of 2184 people were examined. Non-carious lesions were identified and mapped by visual inspection of the oral cavity, and occlusiograms were taken and analyzed in the case of central occlusion.
The results of an epidemiological survey of the population of the Republic of Belarus (2010) and their comparison with data from previous years showed a high frequency and prevalence of non-carious lesions developing after tooth eruption (congenital defects, abfraction, pathological decay, erosion). Currently, this pathology is observed in 40% of middle-aged people (35-44 years old, number of examined people 767) and in 4.21% of 18-year-olds (number of examined people 736).
Among those aged 35-44, the prevalence of combined injuries was 24.8%. In addition, in 23.45±2.4% of cases, a combination of two types of noncarious defects occurred, and a combination of three types - in 3.9±1.1% of cases. The intensity of damaged teeth varies from 0.27 (1.16) to 2.23 (4.03).
The data of the epidemiological survey of the population show that the prevalence of non-carious lesions among the population aged 35-44 years increases from 4.21±0.74% at the age of 18 to 40±1.76%. The prevalence and intensity of tooth erosion increases with age: from 0.95±0.36% to 13.95±1.25%, 0.02(0.2) - 0.44(1.39) and from 2.72±0.6% to 16.3±1.33% 0.034(0.21) - 0.44(1.46) respectively.
The intensity of abfractions in the structure of non-carious diseases also increases with age from 0.45 (0.92) to 0.64 (1.6). At the same time, in patients with non-carious lesions in the cervical region of the teeth, abfractions and pathological tooth wear are observed with age: from 22.6±7.5% to 19.54±2.26% and from 61.3±8.7% to 25.4±2.5%, respectively. This indicates that abfraction defects are the initial signs of increased occlusal load.

Conclusion

Thus, the prevalence and intensity of combined lesions increase sharply with age: 3.22±3.17% and 0.16(0.9) for 18-year-olds; 23.45±2.5% and 2.23(4.03) for 35-44-year-olds, which is typical for the long-term effects of atypical occlusal loading and other pathological risk factors involved in the etiology of non-carious defects. The lack of consensus on the etiology, pathogenesis, and clinical manifestations requires in-depth study to understand, systematize the data and develop recommendations for diagnosis, treatment, and prevention.

REFERENCES

1. Ахмедов А. Б., Камалова Ф. Р. Modern views on the prevalence, etiology and pathogenesis of dental fluorosis in children //Журнал стоматологии и краниофациальных исследований. – 2022. – Т. 3. – №. 1.
2. Ахмедов А.Б. Проблемы профилактики и лечения некариозных поражений зубов в детском возрасте // «Профилактика стоматологических заболеваний» сборник материалов республиканской научно-практической конференция. Ташкент 23-24 март 2018 г. С.11-12.
3. Баратов Ф. и др. Профилактика зубочелюстной аномалий и деформаций у детей и подростков бухарской области //Stomatologiya. – 2015. – Т. 1. – №. 4 (62). – С. 56-59.
4. Борисова Э.Г., Лепехина Л.И., Кумирова О.А. и др. Некариозные поражения тканей зуба // Международный журнал прикладных и фундаментальных исследований. – 2014. – № 3. – С. 149–150.

5. Боровский Е.В. Кариес зубов: препарирование и пломбирование / Е.В. Боровский. – М.: Стоматология, 2001. – 144 с.
6. Боровский Е.В. Эрозия твердых тканей зуба / Е.В. Боровский, П.А. Леус // Стоматология. – 1971. – № 3. – С. 1–5.
7. Браем Марк. Пришеечные поражения, вызванные давлением на зуб // Fenestra. – 1995. – № 4. – 27 с.
8. Гаффоров С. А., Ахмедов А. Б. Тиш қаттиқ тўқимасининг кариес бўлмаган жароҳатлари этиологияси, даволаш ва профилактикаси //Доктор ахборотномаси. – 2019. – Т. 2. – С. 148-153.
9. Гаффоров С.А., Ахмедов А.Б. Научные взгляды на этиопатогенез, лечение и профилактику некариозных поражений тканей зубов (обзор литературы) // Stomatologiya. – 2019. – №2. – С. 79-82.
10. Гланц С. Медико-биологическая статистика / С. Гланц. – М.: Практика, 1999. – 459 с.
11. Гольдштейн Р. Эстетическая стоматология. Второе издание. Том 2. 2005,
12. Грошиков М.И. Некариозные поражения тканей зуба / М.И. Грошиков. – М.: Медицина, 1985. – 172 с.
13. Дмитриева К.М. Эндемические заболевания Амурской области // Амурский исследовательский журнал. – 2014. – № 4. – С. 50.
14. Журбенко В. А. и др. Распространенность некариозных заболеваний полости рта в современной стоматологии //Международный журнал прикладных и фундаментальных исследований. – 2015. – №. 4-2. – С. 301-300.
15. Иорданишвили А. К. Заболевания эндодонта, пародонта и слизистой оболочки полости рта //М.: МЕДпресс-информ. – 2008. – С. 13–18.
16. Луцкая И.К., Марченко Е.И., Чухрай И.Г. Эстетическое пломбирование некариозных дефектов твердых тканей зуба // Современная стоматология. – 2012. – № 1. – С. 29–31.
17. Макеева И. М. и др. Электронно-микроскопическое исследование твердых тканей зуба при клиновидных дефектах //Стоматология. – 2009. – Т. 88. – №. 4. – С. 39-42.
18. Маунт Г. Минимальная интервенция в стоматологии. Кариозные поражения локализации 3 типа // ДентАрт. – 2006. – № 3.
19. Окушко В.Р., Рябцева И.М. Флюороз зубов – маркер интоксикационной гипоплазии // Современная стоматология. – 2016. – № 1. – С. 40–43.
20. Ронкин К. Связь абфракций с дисфункцией височно-нижнечелюстного сустава // Dental Market. – 2010. – № 5. – С. 9–11.
21. Хельвиг Э. и соавт. Терапевтическая стоматология. 1-е изд., 1999.
22. Akhmedov A. B. Diagnostic value of amino acid composition of blood in children with erosion of dental tissues //International confedrence on social and humanitarian research. Cologne, Germany. – 2021. – С. 257-258.
23. Akhmedov A. B., Razhabov A. A. Use of glassionomer cement for filling temporary teeth after gentle preparation //European journal of modern medicine and practice. – 2022. – Т. 2. – №. 12. – С. 56-58.
24. Akhmedov A.B., Ishanova M.K., Qodirova M.T., Dosmukhamedov E.Kh., Utesheva I.Z. Prevalence, prophylaxis and treatment principles of primary teeth erosion in children // International Journal of Psychosocial Rehabilitation, 2020, Vol. 24, Issue 04, pp. 2073-2078.
25. Bahodirovich A. A. Evaluation of the diagnostic value of osteocalcin level and alkaline phosphatase activity in the early diagnosis of erosion of hard tissues of teeth in children //International journal of health systems and medical sciences. – 2022. – Т. 1. – №. 5. – С. 215-219.
26. Bahodirovich A. A., Utkirovna R. D. Modern views on the prevalence, etiology and pathogenesis of dental fluorosis in children //Middle European Scientific Bulletin. – 2021. – Т. 18. – С. 287-293.
27. Brackett W. W. et al. Two-year clinical performance of a polyacid-modified resin composite and a resin-modified glass-ionomer restorative material //Operative dentistry. – 2001. – Т. 26. – №. 1. – С. 12-16.

28. Gafforov S. A., Akhmadaliyev N. N., Akhmedov A. B. The role of the hormonal background of the organism on growth and development of oral cavity tissues // Toshkent tibbiyot akademiyasi axborotnomasi. – 2019. – №. 4. – С. 21-24.
29. Lee W. C., Eakle W. S. Possible role of tensile stress in the etiology of cervical erosive lesions of teeth. J. Prosthet Dent. 1984; 52: 374–380.