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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

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თანამშრომლობითა და მისი პატრონაჟით

ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ
ТБИЛИСИ - НЬЮ-ЙОРК

GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board and The International Academy of Sciences, Education, Industry and Arts (U.S.A.) since 1994. **GMN** carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

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3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

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3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრაფიების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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SYSTEMATIZATION OF STAINED DENTAL PLAQUE IN CHILDREN

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Dental plaque is an umbrella term for tooth deposits and calculus. The dental plaque is a structurally and functionally organized biofilm, attached to the hard surface of the tooth. It is composed of polymers of bacterial origin and coated with a matrix [12]. The term «dental calculus» is used to mean dense (hard) mineralized deposits which form on teeth, exposed to an environment supersaturated with minerals and least cleaned. Many authors have proposed classifications of various types of dental deposits. MI Groshikov [4] in his classification distinguishes the soft plaque (white plaque, smoker's plaque, green plaque) and hard deposits such as calculus. The classification of GN Pakhomov (1982) [4] seems more complete as it covers non-mineralized dental deposits (pellicle, dental plaque, white matter (soft dental plaque), food debris) and mineralized dental deposits (supragingival calculus, subgingival calculus). However, we feel it not entirely appropriate to classify food residues as dental deposits, rather they should be viewed as a favorable environment for growth and maturation of dental deposits. All dental deposits have various degrees of fusion with the surface on which they were formed, while in food residues real fusion is not observed, only in certain species food may have a short-term adhesion to the surface due to their viscosity, but over time their adhesion decreases rapidly. SB Ulitovsky (1999) suggested an extended classification of deposits on teeth [4]:

Dental deposits are classified by:

I. degree of density;

II. degree of mineralization;

III. localization;

IV. severity;

V. place of deposition;

VI. growth stage.

I. By the degree of density they differentiate soft, mixed, semi-hard (those that are compacted), hard deposits;

II. By the degree of mineralization:

1. plaque (0-stage of generation);

2. non-mineralized (1st - mild phase of spread and accumulation);

3. mineralizing (2nd - transitional phase with compaction under way);

4. mineralized (3rd - final phase of dental calculus formation).

III. By the localization:

1. supragingival:

- by density (soft, hard, mixed);

- by distribution (towards the periodontal sulcus, incisal edge, deep into the fissures, stable);

2. mixed;

3. subgingival;

- by density (solid);

- by height (in the cervical region, the upper third of the root, to the middle of the root length, to the apex of the root);

- by localization (one root surface, two, three, root bifurcation area, total).

IV. By the severity:

1. tooth plaque;

2. soft plaque;

3. soft plaque with minor subgingival calculus;

4. pronounced supragingival calculus without destruction of the

periodontal sulcus;

5. insignificant supragingival calculus with destruction of the periodontal sulcus;

6. pronounced supragingival calculus with destruction of the periodontal sulcus;

7. pronounced subgingival calculus growing along the root.

V. By the place of deposition:

1. on teeth;

2. on seals;

3. on crowns;

4. on fixed dentures;

5. on removable dentures;

6. on tartar

VI. By the growth stages

1. growth of dental plaque outside;

2. growth inward;

3. mixed growth;

4. stable growth (in some cases can be considered as a transitional phase).

Doc. MUDr. Ivo Drizhal, CSc. (2001) proposed a simplified classification of dental deposits [4]: supragingival plaque (coronal and marginal), subgingival plaque, fissure plaque.

The dental plaque is differentiated into two categories by P. Godoroja and O. Dulghieru (2004) [8], namely: supra- and sub-gingival. Supra-gingival plaque at and above the dento-gingival junction is most commonly found at: gingival third of the crown of the tooth, inter-proximal areas, pits and fissures and also on other such surface with irregularities. Sub-gingival plaque below the dento-gingival junction is usually divided into: tooth adherent zone, epithelial adherent zone, non adherent zone [8].

In the international classifier of diseases (ICD-10), chapter XI Diseases of digestive organs (K00-K93): class Diseases of oral cavity, salivary glands and jaws (K00-K14), deposits (growth) on teeth (K03.60) are presented as: concrete, black, green, white, orange, tobacco ones [11].

Having examined the relevant literature, we failed to find a full and comprehensive classification of stained plaque, which may be of much use for clinicians, since this type of plaque occurs in both children and adults [5,9,10,14,17,18,22,23,25].

Thus, the aim of our study was to present a more complete systematization of stained plaques.

Materials and methods. The results of a survey of 154 children aged 6 to 15 years, who sought dental care in the pediatric clinic No. 1 of the Darnitsky district of Kyiv, Ukraine [15] and 408 children aged 6 to 17 years, who are students at the gymnasium No. 295 of the Darnitsky district of Kyiv, Ukraine [10] are presented in Table 1.

The children's health data were obtained from the primary medical records № 112/o «History of child development» (Order of the Ministry of Health of Ukraine № 527 dated 28.07.2014, with amendments № 587 dated 28.02.2020).

Based on a literature review and two own studies [10,15], a systematization of stained plaque, which takes into account the color of plaque, its localization, the degree of cariogenicity and classes of associated diseases (according to the international classification of diseases of 10th revision - ICD 10) is proposed.

Table 1. The prevalence of stained plaque in the examined children, intensity of dental caries and cavities depending on the color of stained plaque

Color of stained plaque	Number of children with stained dental plaque, n	DMF+df-index, teeth (M±m)	DMF+df-index, cavities (M ± m)	The number of children from the total number with stained dental plaque, %	The number of children from the total number of examined children, %
The results of our own research, involving 154 children aged 6 to 15 years [15]					
Orange	13	8,85±2,19	9,62±2,93	40,62	8,44
Green	7	4,57±1,81	4,86±2,34	21,88	4,55
Black	7	1,0±1,29	1,29±1,89	21,88	4,55
Brown	5	0,6±0,89	0,6±0,89	15,62	3,25
Total/Average	32	5,57±3,94	6,35±4,69	100	20,79
The results of our own research, involving 408 schoolchildren aged 6 to 17 years [10]					
Orange/Yellow	19	6,7	-	59,38	4,66
Black	12	3,0	-	37,5	2,94
Brown	1	11,0	-	3,12	0,25
Total/Average	32	5,18	-	100	7,85

Results and discussion. Given the prevalence of stained plaque, we propose to systemize it by a number of indicators.

I. Stained plaque can be classified by COLOR:

1. Black stain. Black stain, along with dental caries, is another challenge in pediatric dentistry [17, 25]. Its prevalence rate in children varies from 2.4 to 18% [2,6,7,13,14,25], while the studies in adults are few [23].

In the European part of the continent of Eurasia, the prevalence of black stain is 7.54% in children of 4-11 years (n=1100) in Valencia (Spain), 6.3% in children of 6-12 years (n=1086) in Potentsa (Italy) [25], 3.1% in 6-year-old children (n=3272) in Oviedo (Spain) [13], 2.4% in children of 3-5.5 years (n=950) in Thessaloniki (Greece) [3].

In our studies black plaque was diagnosed in 2.94 [10] to 4.55% [15] of children aged 6 to 17 years (n=562) in Kyiv, Ukraine.

In the Asian part of Eurasia the prevalence of black stain is 16% in children of 10-12 years (middle age 11.7±1.1 years) (n=1748) [25], 18% in children of 6-12 years (middle age 9.4±1.9 years) (n=1472) in Udaipur (India) [1], 9.9% in children (middle age 4.55 years) (n=1937) in Shanghai (China) [6].

In South America the prevalence of black stain is 3.5% in children of 5 years (n=1120) [7] and 14.8% in children of 6-12 years (n=263) [25] in Pelotas (Brazil), 4.16% in children of 3-10 years (n=433) in Rosario (Argentina) [25].

The black stain is tightly adhered to the enamel surface and cannot be removed with a probe (Fig. 1).



Fig. 1. Child, 7 years old. Black stain

2. Brown stain. In our studies, brown plaque was diagnosed in 0.25 [10] to 3.25% [15] of children aged 6 to 17 years (n=562) Kyiv, Ukraine.

Dark brown plaque resembles the plaque of smokers [24].

Brown plaque occurs as a result of exposure to exogenous factors: food and beverages (tea, coffee, wine, cat (leaves of *Catha edulis*, Arabic tea, etc.), tobacco products, metals, iodine, rinsing with solutions of chlorhexidine, cetylpyridine chloride, toothpastes with fluoride [21], tin fluoride, doxycycline [19].

Intensive staining of dark brown dental plaque appears, apparently, for the same reason as pigmentation in periodontal disease: hemosiderin and other products of erythrocyte death, which appear in saliva due to diffuse bleeding of the gums, paint the plaque dark [24].

Dark brown plaque occurs primarily in children without periodontal inflammation [24].

Dark brown plaque is firmly attached to the necks of the teeth [24].

Brown stain is poorly removed with a probe (Fig. 2).



Fig. 2. Child, 7 years old. Brown stain

3. Green stain. In our studies, green plaque was diagnosed in 4.55% [15] of children aged 6 to 15 years (n=154) in Kyiv, Ukraine.

Green plaque is most common in children with poor oral hygiene [21]; it may follow the destruction of blood pigments after gingival bleeding or can be caused by chromogenic bacteria, chemical compounds of copper, nickel [15,21].

It is known that green plaque is tightly connected to the enamel of the tooth, it is very hard to remove by a toothbrush and it is sufficiently difficult to remove by instruments [15].

The green plaque is observed to frequently combine with other types of plaque. In general, the green colour has most often shades of marsh color (Fig. 3). Perhaps, it should be additionally divided according to the intensity of staining: a) intense; b) of low intensity.



Fig. 3. Child, 7 years old. Green plaque.

4. Orange stain. In our studies, orange plaque was diagnosed in 4.66 [10] to 8.44% [15] of children aged 6 to 17 years (n=154) Kyiv, Ukraine.

The orange plaque is associated with the influence of chromogenic bacteria, metals and doxycycline [19].

Yellow-gold stains on the surface of teeth can form with tin fluoride (SnF₂). It is believed that the low pH of SnF₂ causes denaturation of the pellicle protein under the influence of sulfhydryl groups, which subsequently form tin sulfide, giving the corresponding shade [14].

This type of the dental plaque is characterized by an orange color of varying intensity, which is poorly stained by dyes. The soft texture of the orange plaque makes it easy to remove with a probe (Fig. 4).



Fig. 4. Child, 6 years old. Orange plaque

5. Blue stain. When examining a 4-year-old child with West syndrome (a special form of epilepsy in infants in the first year of life), blue plaque was found. After histopathological examination of the material, *Pseudomonas aeruginosa* was isolated. Blue-pigment-producing bacteria are commonly shed in chronic lung infections [5].

II. COMBINING OF PLAQUES:

1. **One color plaque** – the plaque is colored in the same color (Fig. 5).



Fig. 5. Child, 7 years old. Black stain on the teeth of the upper jaw

2. **Combined dental plaque.** Occasionally, children were noted to have several types of stained plaque [14], such as orange and brown, and soft white (Fig. 6).



Fig. 6. Child, 8 years old. Combined plaque, several types of stained plaque present, such as orange and brown, and soft white

III. BY THE DEGREE OF SUSCEPTIBILITY TO CARIES:

The assessment of dental plaque cariogenicity was carried out according to the procedure proposed by J.L. Hardwick, E.B. Manly (1952); the acid activity was determined with the use of the colorimetric method of indicator's color changing from yellow to pale orange (0-30%); from pale orange to red (40-60%); from red to dark red (70-100%); methylene red was used as a color indicator for dental plaque. One percent of glucose solution was applied for several minutes on the tooth enamel; 0.1% aqueous solution of methylene red was applied on the surface of lower incisors. The results of staining were interpreted in the following way: the indicator was positive if the color of the stained plaque changed to red; the indicator was negative if the color did not change.

1. High degree of cariogenicity.

When stained with the methylene red, 100% of the orange plaque samples showed a change in color, and therefore, this type of plaque has a high degree of cariogenicity.

After the removal of plaque in 22 of 32 pediatric patients with orange plaque (68.75%) on the enamel surface there were detected the demineralization zones in the form of matte chalky areas or carious cavities within the boundaries of the mantle dentin (Fig. 7).

According to the researchers of the orange plaque, this is due not only to impaired self-cleaning and unsatisfactory oral hygiene, but also to changes in the properties of enamel, a decrease in its structural and functional resistance, which enhances the processes of enamel demineralization [15].



Fig. 7. Child, 6 years old. Orange plaque. On the enamel surface, the demineralization zones in the form of matte chalky areas and carious cavities within the boundaries of the mantle dentin are detected

2. Low degree of cariogenicity

When stained with methylene red the black and brown dental plaque did not show the change in the indicator color, therefore, these types of plaque can be considered as having a low degree of susceptibility to caries.

When staining the green plaque with methylene red, no change in the indicator color was observed, only the green color of the plaque increased, which can also be considered as having a low degree of cariogenicity.

After removing the black and brown plaque, the surface of the tooth enamel underneath was shiny, without damage or traces of demineralization. After professional cleaning of the teeth of patients with black plaque, the plaque was observed to re-form after two months [25].

IV. BY LOCALIZATION.

For black stain, localization in the area of the necks of all groups of teeth is characteristic, and sometimes black stain covers the entire surface of the tooth (Fig. 8). It can be deposited in the form of stripes on the tooth along the edge of the gums or spots on the vestibular and lingual surfaces.



Fig. 8. Child, 7 years old. Black stain on the teeth of the lower jaw

Brown plaque generally forms on existing soft plaque, such as between teeth, closer to the marginal edge of the gum, in depressions and fissures [21].

Dark brown plaque is found mainly on the front teeth of children and is located in a narrow strip along the gingival margin [24].

Brown plaque was detected in natural cavities of teeth, on lingual surfaces in the form of a thin colored layer and was poorly removed with a probe (Fig. 3).

For green colored plaque it is typical to localize only on the labial and buccal surface of the milk and permanent teeth in the form of a border or furrows in the gum edge (mainly in children). Deposits on the teeth of the upper jaw are noted more often, than those on the teeth of the lower jaw. Under a microscope, the enamel of such teeth is covered in numerous thin holes, densely populated with bacteria [1].

Green plaque was noted to form on the vestibular surfaces of the anterior group of teeth (see Fig. 4).

Orange plaque is more often localized in the cervical region of the molars; can also be observed on the incisors of the upper and lower jaw (Fig. 9).



Fig. 9. Child, 6 years old. Orange stain

To sum up the above, stained plaque was mainly localized:

1. On permanent teeth.
2. On milk teeth.

On types of teeth:

1. On the incisors.
2. On the canines.
3. On the premolars.
4. On the molars.
5. Combined localization.

On tooth surfaces:

1. On the chewing surface of the tooth.
2. On the cervical surface of the tooth.
3. On the lingual surface of the tooth.
4. On the vestibular surface of the tooth.
5. On the oral surface of the tooth.
6. Non-systemic raid.

Colored dental plaque, according to the degree of distribution, could occupy:

1. Up to 1/3 of the tooth crown.
2. Up to 2/3 of the tooth crown.
3. More than 2/3 of the tooth crown.

Also, stained plaque varied in time of occurrence:

1. Permanent.
2. Appearing periodically.

Table 2. The incidence of stained dental plaque in the main classes of diseases [15]

Letter	Class	Title	Color of stained plaque								Total abs.	% of number of children, n=64
			Orange		Black		Green		Brown			
			number of children, n=32		number of children, n=19		number of children, n=7		number of children, n=6			
			abs.	%	abs.	%	abs.	%	abs.	%		
A	I	Certain infectious and parasitic diseases	-	-	6	31,58	-	-	-	-	6	9,38
B												
D	III	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	3	9,38	3	15,79	-	-	1	16,67	7	10,94
J	X	Diseases of the respiratory system	13	40,63	8	42,11	3	42,86	2	33,33	26	40,63
K	XI	Diseases of the digestive system	5	15,63	5	26,32	2	28,57	3	50,00	15	23,44
N	XIV	Diseases of the genitourinary system	21	65,63	-	-	1	14,29	1	16,67	23	35,94
Total abs.			42		22		6		7		77	
More than 2 classes of diseases at a time			13	40,63	6	31,58	-	-	1	16,67	20	31,25

V. RELATING TO THE CLASS OF THE DISEASE (ICD 10).

Associated diseases were detected in 52 (81.25%) children, with most of them belonging to 5 classes of diseases according to ICD 10. As seen in Table. 2, the prevalent disease classes are as follows: Class X («Respiratory diseases») - 40.63%, Class XIV («Diseases of the genitourinary system») - 35.94%, Class XI («Digestive diseases») - 23.44%. Class III («Diseases of the blood and blood-forming organs») was detected in 10.94%, Class I («Some infectious and parasitic diseases») in 9.38% of children. 31.25% of children had two or more classes of diseases.

It is known that the associated diseases of different classes give dental plaques specific colors [14].

The black dental plaque was found in children: with some infectious and parasitic diseases (class I (B65-B83): ascariasis (B77.0)¹ [15]; with blood diseases (class III (D50-D89): iron deficiency anemia (D50) [13]; with endocrine, nutritional and metabolic diseases (class IV (E00-E90): malnutrition (E40-E46) [26]; with mental and behavioral disorders (class V (F00-F99): autism spectrum disorders (F84 .0, F84.1, F84.2, F84.3, F84.4, F84.8, F84.9) [27], expressive language impairments (F80.1), mild mental retardation (F70), general speech underdevelopment (F80.2), mental retardation (F88.8) [28], onychophagia (F98.8) [15]; with diseases of the ear and mastoid bone (class VIII (H60-H95): infectious processes in the internal (H83 .0) or middle ear (H65.0) [15]; with respiratory diseases (class X (J00-J99) [13]: influenza and pneumonia (J09-J18) [16], acute tonsillitis (J03), bronchial asthma (J45), chronic rhinitis and (J31.0) [15]; with diseases of the digestive system (class XI (K00-K93) [13]: enterocolitis (K55.1), functional disorders of the intestine, unspecified (K59.9) [27], maxillofacial anomalies: malocclusion due to sucking of the tongue, lips or fingers (K07.5) [15]; with skin diseases (class XII (L00-L99): allergic contact dermatitis (L23) [27]; with symptoms, signs and abnormalities (class XVIII (R00-R99): breathing through mouth (R06.5) [15].

¹After recovery from an associated disease, the black plaque gradually disappeared

Green dental plaque is found in patients with intestinal dysbiosis associated with gastroduodenitis [18].

Yellow dental plaque is detected in 1/3 of patients with chronic pyelonephritis [24].

The examination of 562 children revealed stained plaque in 64 children [10, 15]. The results were distributed according to the incidence in different classes of diseases (according to ICD 10) and are presented in Table 2.

We have noted [15], that green plaque is present in 3 out of 7 (42.86%) children with respiratory diseases (grade X), in 2 out of 7 (28.57%) children with digestive diseases (grade XI) (Fig. 10), in 1 out of 7 (14.29%) with diseases of the genitourinary system (XIV class).



Fig. 10. Child, 7 years old. Green plaque. Class XI («Diseases of the digestive system») in medical history

In our study [15], black plaque was recorded in 8 out of 19 (42.11%) children with respiratory diseases (class X), in 6 out of 19 (31.58%) children with parasitic diseases (class I), in 5 out of 19 (26, 32%) of children with diseases of the digestive system (XI class), and in 3 of 19 (15.79%) children with diseases of the blood and hematopoietic organs (III class) (Fig. 11).



Fig. 11. Child, 6 years old. Black stain. Class III (“Diseases of the blood and hematopoietic organs”) in medical history

In our study [15], orange plaque was detected in 21 out of 32 (65.63%) children with history of diseases of the genitourinary system (XIV class of diseases) (Fig. 12), in 13 out of 32 (40.63%) children with respiratory diseases (X class), in 5 out of 32 (15.63%) children with digestive diseases (XI class), in 3 out of 32 (9.38%) children with diseases of the blood, hematopoietic organs (III class).



Fig. 12. Child, 6 years old. Orange plaque localized in the cervical region of primary canines and molars. Diseases of the genitourinary system (XIV class) in history



Fig. 13. Child, 8 years old. Combined brown and orange plaque, localized in the cervical region on the teeth of the lower jaw and on the vestibular surface of the incisors of the upper jaw. Diseases of the blood and blood-forming organs (III class) and of the genitourinary system (XIV class) in medical history. Identification of soft white dental plaque by staining the anterior group of teeth with methylene blue

Among the nosological units in children with the XIVth class of diseases in anamnesis, prevail: chronic cystitis, uric acid diathesis, chronic pyelonephritis. Considering high percentage of children with orange plaque, who had genitourinary diseases in history, it can be assumed that it is this pathology that affects its formation.

It was found that the group of children with orange plaque had the highest percentage (40,63%) of children, who simultaneously had associated diseases from two or more classes.

Among the examined children, a combination of several types of stained dental plaque was observed: brown and orange, as well as a light soft plaque (Fig. 13).

Also, the classification of colored plaque may consider its consistency (soft - orange, dense - black, brown, green).

Thus, given the linkages between the stained dental plaque and diseases in history, characteristics of the diet, intensity of the carious process, we systematized stained plaque by its color (black, brown, green, orange, blue), its localization on the tooth surface, the degree of cariogenicity (high, low) and class of diseases (according to ICD 10).

The present study is a part of the research, undertaken by the Pediatric Dentistry Department of the Private Higher Educational establishment «Kyiv Medical University»: «The Risk Assessment, Pathogenesis, Clinical Manifestations, Treatment and Prevention of Different Pediatric Dental Diseases» (state registration number 0112U008260).

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SUMMARY

SYSTEMATIZATION OF STAINED DENTAL PLAQUE IN CHILDREN

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Deposits on teeth may differ in color and degree of cariogenicity. Their prevalence rate is up to 18%. The review of relevant

literature revealed a lack of classification of stained plaque in children. In this paper the systematization of stained plaque is proposed.

The aim of our study was to systematize stained dental plaques.

The literature review and two own researches, involving 154 children from 6 to 15 years and 408 children from 6 to 17 years, resulted in the proposed systematization of stained plaques, based on plaque color, its localization, degree of cariogenicity and classes of associated diseases (according to the international classification of diseases, 10th revision - ICD 10).

Colored dental plaque was found in 64 children from 6 to 17 years old. It is systematized according to its color (black, brown, green, orange, blue), its localization on the tooth surface, the degree of cariogenicity (high, low) and the class of associated diseases (according to ICD 10).

At present, the correlation between stained dental plaque formation and associated diseases, diet characteristics, carious process intensity, and oral microflora has not been sufficiently disclosed, and therefore these issues require further examination.

Keywords: dental plaque, black stain, brown stain, green stain, orange stain, systematization of colored dental plaques, the class of diseases.

РЕЗЮМЕ

СИСТЕМАТИЗАЦІЯ ПІГМЕНТИРОВАННИХ ЗУБНИХ НАЛЕТОВ У ДІТЕЙ

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Зубные отложения бывают разного цвета и степени кариеогенности. Их распространенность достигает 18%. Обзор соответствующей литературы выявил отсутствие классификации окрашенного зубного налета у детей. В статье предложена систематизация пигментированного зубного налета.

Целью исследования явилась систематизация пигментированного зубного налета у детей.

На основании обзора литературы и двух собственных исследований, проведенных на 154 детях в возрасте от 6 до 15 лет и 408 детях от 6 до 17 лет предложена систематизация окрашенного зубного налета с учетом его цвета, локализации, степени кариеогенности и классификации болезней, связанной с данными показателями (Международная классификация болезней 10 пересмотра – МКБ 10).

У 64 детей в возрасте от 6 до 17 лет выявлен зубной налет, который систематизирован с учетом цвета (черный, коричневый, зеленый, оранжевый, голубой), локализации на поверхности зуба, степени кариеогенности (высокая, низкая) и МКБ 10.

Взаимосвязь возникновения зубного налета различного цвета с классификацией болезней, особенностями пищевого рациона, интенсивностью кариозного процесса, микрофлорой полости рта по сей день недостаточно раскрыта, в связи с чем эти вопросы требуют дальнейшего изучения.

რეზიუმე

კბილის პიკემენტრებული ნადების სისტემატიზაცია ბავშვებში

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კბილის ნადები სხვადასხვა ფერისაა და ხასიათდება კარიესოგენურობის სხვადასხვა ხარისხით. მისი გავრცელება 18%-ს აღწევს. თანამედროვე ლიტერატურის მიმოხილვით გამოვლინდა ბავშვებში კბილის შეფერილი ნადების კლასიფიკაციის არარსებობა.

კვლევის მიზანს წარმოადგენდა კბილის პიკემენტრებული ნადების სისტემატიზაცია ბავშვებში.

ლიტერატურის მიმოხილვის, ასევე, 6-15 წლის ასა-

კის 124 ბავშვზე და 6-17 წლის ასაკის 408 ბავშვზე ნატარებელი ორი საკუთარი კვლევის საფუძველზე ავტორების მიერ შემოთავაზებულია კბილის შეფერილი ნადების სისტემატიზაცია მისი ფერის, ლოკალიზაციის, კარიესოგენურობის ხარისხის და ამ მახევენებლებთან დაკავშირებული დაავადებების კლასიფიკაციის მიხედვით (დაავადებების საერთაშორისო კლასიფიკაცია, მეათე გადახედვა).

6-17 წლის ასაკის 64 ბავშვს გამოუვლინდა კბილის ნადები, რომელიც სისტემატიზირებულია ფერის (შავი, ყავისფერი, მწვანე, ნარინჯისფერი, ცისფერი), კბილის ზედაპირზე ლოკალიზაციის, კარიესოგენურობის (მაღალი, დაბალი) და დაავადებების საერთაშორისო კლასიფიკაციის (მეათე გადახედვა) მიხედვით.

კბილის სხვადასხვა ფერის ნადების განვითარების კავშირი დაავადებათა კლასიფიკაციასთან, კვების რაციონის თავისებურებებთან, კარიესული პროცესის ინტენსიურობასთან, პირის ღრუს მიკროფლორასთან დღემდე არ არის სათანადოდ ახსნილი; შესაბამისად, ეს საკითხები შემდგომ კვლევას საჭიროებს.

ИСПОЛЬЗОВАНИЕ ЛЕЧЕБНОЙ ГРЯЗИ АХТАЛА В КОСМЕТИКЕ И КОСМЕЦЕВТИКЕ

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Грязь Ахтала является лечебной грязью псевдовулканического происхождения и представляет собой смесь густой массы грязи и воды. Ахтальскую грязь можно считать уникальной по лечебным свойствам, что связано как с химическим составом, так и с температурным режимом. Водный раствор, как и сама грязь, высокоминерализован, содержит в большом количестве соли Ca, Mg, Fe, Al, Sn, Br, I, F и других элементов [1]. Грязь содержит до 20% коллоидного комплекса, благодаря чему она пластичная и вязкая, легко наносится на кожу, образуя достаточно плотную поверхность. Грязь обладает сорбционной активностью, поэтому легко сорбирует с кожи микробную флору. Бальнеологические процедуры с использованием грязи Ахтала повышают защитные функции организма, применяется при заболеваниях позвоночника и костно-суставных поражениях, переломах костей, с целью реабилитации, при заболеваниях периферической нервной системы, радикулитах, плекситах, ишиасе, артритах, солевых наростах, для лечения различных кожных заболеваний - псориаза, экзем, дерматита. [2,8]. Несмотря на то, что местное население давно использует грязь при проблемах с кожей лица, в косметологических целях грязь Ахтала не используется. Хотя в последние годы описаны многочисленные косметические и косметические препараты, кремы для различных заболеваний кожи, маски, скрабы, эликсиры, содержащие либо различные лечебные грязи, либо их компоненты [4-7,9-11].

Использование самих неразбавленных лекарственных грязей для лечения кожи лица в ряде случаев ограничено риском раздражения и аллергических реакций, а также ее сенсорными свойствами. Поэтому более целесообразно применение в косметике и космецевтике самой грязи Ахтала, либо извлечений из нее липофильными растворителями,

в смеси с различными мазевыми основами. Основной проблемой при создании подобных систем является уровень солубилизации, т.е. стабильность их без расслаивания в течение времени применения. Следует учитывать и тот факт, что в зависимости от возможного применения мазей и кремов, в их состав вводятся растительные экстракты, кислоты, масла, некоторые органические и неорганические вещества, солубилизация которых со смесью основа + лечебная грязь (вытяжка из нее) также является определенной проблемой.

Целью проведенного исследования явилась разработка косметических и космецевтических систем, содержащих лечебную грязь Ахтала, обладающих достаточной стабильностью.

Материал и методы. На основании проведенных ранее экспериментов в большинстве случаев использовалась основа для получения кремов, содержащая моноглицериды дисстиллированные, эмульсионный воск, растительные масла, цетил пальмитат, стеарин, воск пчелиный очищенный, карбомер 940, глицерин, воду обессоленную. Следует отметить, что при изучении стабильности разработанных систем, что подчеркивает и уровень солубилизации, в качестве основного теста использовалось центрифугирование в течение 5 минут при числе оборотов ротора 6000 об/мин. Предварительное изучение использованной основы показало полное соответствие существующим требованиям [3]. Исследовался процесс солубилизации основы с лечебной грязью, с проэкстрагированной из грязи суммой липофильных веществ, с рядом растительных экстрактов (в виде сухих, водных и глицериновых экстрактов), с некоторыми растительными маслами, органическими кислотами и другими веществами, используемыми в косметических и космецевтических кремах.