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Реферати

ОСОБЛИВОСТІ УДОСКОНАЛЕННЯ НАДАННЯ МЕДИЧНИХ ПОСЛУГ В УКРАЇНІ

Гаврилюк А.А., Жарлинская Р.Г., Даценко Г.В., Сорокоумов В.П., Мищук А.А., Котуза А.С.

В статье определены сущность и особенности медицинской услуги в контексте правового и маркетингового подхода. Предложена классификация медицинских услуг с использованием экономических и правовых критериев. Дана оценка медицинских услуг как объекта правового регулирования в Украине на современном этапе. Изучены некоторые аспекты функционирования рынка медицинских услуг, в том числе их рекламы. Были сделаны предложения по совершенствованию действующего законодательства, регулирующего рынок медицинских услуг в Украине, на основе международных правовых стандартов.

Ключевые слова: рынок медицинских услуг, учреждение здравоохранения, конкуренция, медицинская услуга, правовое регулирование.

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FEATURES OF IMPROVING THE MEDICAL SERVICES PROVISION IN UKRAINE Havrilyuk A.A., Zharlinska R.G., Datsenko H.V., Sorokoumov V.P., Mischuk .A.A., Kotuza A.S.

In the article, the authors identified the nature and features of healthcare services in the context of legal and marketing approach. The classification of healthcare services using economic and legal criteria is proposed. The assessment of medical services as an object of legal regulation in Ukraine at the present stage is given. Some aspects of functioning of the market of medical services, in particular their advertising, are studied. Proposals have been made to improve the current legislation governing the market for medical services in Ukraine, based on international legal standards.

Key words: healthcare market, healthcare organization, competition, healthcare service, legal regulation.

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DEPENDENCE OF CARIES INTENSITY IN INDIVIDUALS OF THE KHARKIV REGION AND THE AJACENT AREAS POPULATION, BORN WITH MACROSOMIA, ON THE BODY MASS INDEX AT BIRTH

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The total of 220 persons aged 11 – 55 years has been examined. The indices of caries are determined, the hygienic state of oral cavities is assessed, the mixed saliva secretion rate and the rate of minor salivary glands secretion are assessed, the number of salivary glands per a definite area is calculated for all participants, and the status of acid-alkaline balance of the oral fluid is estimated in 140 persons, who were born with fetal macrosomia, and in 80 persons, who were born with fetal normosomia (whose parameters at birth were normal). These groups have a proportional representation of age and sex. The conclusion has been made that among the participants of the study, who were born macrosomes, in the period of permanent occlusion, the highest values of caries indices (caries intensity index and significant caries index) are characteristic of macrosomic-at-birth persons born with intrauterine obesity. Individuals born with macrosomia have, on average, a reliably reduced number of minor salivary glands per an area unit, a reduced rate of the mixed saliva secretion and a reduced rate of the minor salivary glands secretion as compared to those whose parameters at birth were normal.

Key words: fetal macrosomia, oral cavity, permanent dentition period.

The work is a fragment of the research project "The nature, structure and treatment of major dental diseases", state registration No. 0116U004975.

High intensity caries of permanent teeth is associated with poor hygiene of the oral cavity, the composition of saliva produced by small and large salivary glands, genetically caused insufficient mineralization of hard tooth tissues, the presence of systemic diseases and with other factors [5].

In our studies, it has been proved that in the period of temporary [2, 5] and mixed occlusion, high caries intensity is characteristic of children born with large gestational age (macrosomia of the fetus means that the body weight at birth exceeds or equals 4. kg). These results are consistent with data obtained by a number of domestic and foreign researchers [1, 2]. Consequently, a logical question arises about the intensity of the permanent teeth caries in persons born with a macrosomia.

The purpose of the study was to determine the intensity of caries in individuals of the north-east Ukraine's population with permanent occlusion, whose weight-growth parameters at birth were assessed as macrosomia, taking into account the presence of persons with harmonious intrauterine development, with intrauterine obesity or with relative intrauterine body weight insufficiency among them.

Materials and methods. The study was carried out on the basis of the University Dental Center at Kharkiv National Medical University during 2014-2019. The total of 220 persons with different status of dental health participated in the study. One hundred and forty persons aged 12 to 55 years born with macrosomia constituted the main group, and 80 persons of the appropriate age, whose weight-growth parameters at birth were normal (fetal normosomia), were included into the comparison group. The study did not include persons with obesity or diseases that affect the oral cavity organs' status. Information on the weight-growth parameters of the participants under study at birth was obtained from the delivery records of maternity hospitals, hospital records of in-patients, infant's records, identification tags or newborn's bracelets and other medical records, which were stored in the archives of medical institutions or in participants under study.

Based on the coefficient of intrauterine development harmony proposed by Kharkiv researchers [3], which takes into account the weight-growth parameters of the child at birth, all participants in the main group were divided into four subgroups. *Subgroup I* included persons with long, harmoniously developed body and relatively reduced body weight at the time of birth. *Subgroup II* included persons with a large body length and a relatively reduced body weight at the time of birth. *Subgroup III* included individuals who had a large length and increased body weight at the time of birth. Hryshchenko V.I. et al [1] classified such newborns as infants with intrauterine acceleration against the background of obesity. *Subgroup IV* included persons who had a moderate body length and pronounced obesity at the time of birth.

Distribution of the participants in the study was based on the WHO classification, but the age that coincides with the permanent bite formation period was divided into two additional ones in order to take into account changes in the oral cavity condition that are characteristic of children in the puberty period. The first age period included children aged 11-17 years, who had all the permanent teeth at the time of the study (with the exception of the third molars). The second age period included 18- to 24-year-old participants of the study. The third age period included participants with a formed bite aged 25-44 years (according to the WHO classification, this age is young). The fourth age period, included study participants aged 45 to 55 years. The distribution of the participants' number by groups and subgroups and the somatometric indices of the participants at their time of birth are shown in table 1.

The study was carried out in accordance with the Council of Europe Convention "The Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine: the Convention on Human Rights and Biomedicine (ETS No. 164)" of 04.04.1997, and the Helsinki Declaration of the World Medical Association (2008). To participate in the study, each participant whose age was over 18 years gave the informed consent. For participants under the age of 18 years, the informed consent was obtained from parents or guardians.

In all participants of the study, the hygienic state of the oral cavity was determined by the OHI-S index (Green-Vermillion). Caries prevalence and intensity was determined and the Significant Index of Caries (SIC) was calculated [4, 5].

Determination of the mixed unstimulated oral fluid secretion rate was performed, the fluid being collected in the morning into the graduated tube for 10 minutes. The secretion rate was expressed in ml/min. For the quantitative assessment of the small salivary glands' secretion, the method of Yakovleva V.I. was used. [2, 6]. The hydrogen index was measured using indicator paper with a pH range of 4.5 - 7.5 and the acidity interval of 0.2 units. The test paper bands were immersed into the oral fluid for 10 seconds and then their color was compared to the scale that was included in the kit.

Assessment of the studied parameters mean values was performed using the MS Excel 2016 software. The hypothesis about the difference between the mean values in small groups was performed using the non-parametric statistics method (by Mann-Whitney criterion) using the Statistica 6.0 software package. The percentage of cases when certain features were observed in groups and subgroups with appropriate confidence intervals with error probability of p < 0.05 was assessed for the binomial distribution law of the randomized value [7].

Table 1
Distribution by age and mathematical expectation values of weight-growth parameters at birth of persons involved in the study

Group, age subgroup (AS)	Comparison	Main	Subgroup I	Subgroup II	Subgroup III	Subgroup IV
Number of	14 (8 х., 6 д.)	26 (16 х., 10 д.)	7 (4 х., 3 д.)	6 (3 х., 3 д.)	6 (3 х., 3 д.)	7 (6 х., 1 д.)
persons, AS I						
AS II	28 (17 х., 11 д.)	39 (26 х., 13 д.)	10 (8х., 2 д.)	8 (4х., 4 д.)	9 (6х., 3 д.)	12 (8 х., 4 д.)
AS III	26 (15 ч., 11ж.)	50 (30ч., 20ж.)	12 (8ч., 4 ж.)	7 (5ч., 2 ж.)	9 (6ч., 3 ж.)	22 (10 ч., 12ж.)
AS IV	12 (7 ч., 5 ж)	25 (15 ч., 10 ж.)	4 (2 ч., 2 ж.)	3(1ч., 2 ж.)	5 (3 ч., 2 ж.)	13 (9 ч., 4 ж.)
Body weight at	3.288	4.175*	4.100*	4.153*	4.357*	4.114*
birth, kg AS I		(p=0.0000)	(p=0.00024)	(p=0.00051)	(p=0.00052)	(p=0.00024)
AS II	3.325	4.28*	4.280*	4.138*	4.478*	4.242*
		(p=0.0000)	(p=0.0000)	(p=0.00002)	(p=0.00001)	(p=0.00000)
AS III	3.356	4.292*	4.304*	4.171*	4.611*	4.193*
		(p=0.0000)	(p=0.0000)	(p=0.00006)	(p=0.00001)	(p=0.00000)
AS IV	3.413	4.276*	4.075*	4.033*	4.480*	4.315*
		(p=0.0000)	(p=0.00134)	(p=0.00833)	(p=0.00139)	(p=0.00002)
Body length at	51.86	54.96*	55.14*	58.67*	54.67*	51.86
birth, см, AS I		(p=0.00124)	(p=0.00531)	(p=0.00050)	(p=0.00760)	
AS II	52.25	54.82*	55.90*	58.13*	55.00*	51.58
		(p=0.00026)	(p=0.00014)	(p=0.00005)	(p=0.00072)	
AS III	51.85	54.56*	56.17*	58.29*	55.33*	52.18
		(p=0.00001)	(p=0.00000)	(p=0.00005)	(p=0.00008)	
AS IV	52.17	53.52	54.40	57.67*	54.40	51.77
				(p=0.01304)		
Body weight	23.77	25.46	24.46	20.59	26.67*	29.58*
index at birth,				(p=0.02092)	(p=0.00831)	(p=0.00034)
kg/m³, AS I					_	
AS II	23.50	26.34*	24.50	21.09*	26.89*	30.94*
		(p=0.00496)		(p=0.00864)	(p=0.00099)	(p=0.0000)
AS III	24.62	26.71*	24.29	21.07*	27.23*	29.61*
		(p=0.00144)		(p=0.00081)	(p=0.00044)	(p=0.0000)
AS IV	24.31	28.23*	24.83	21.07*	27.79*	31.21*
		(p=0.00857)		(p=0.04312)	(p=0.03479)	(p=0.00022)

Notes: * the difference between the groups of macrosomes and normosomes is statistically reliable, error probability at p <0.05.

Results of the study and their discussion. The oral hygiene condition, which was classified as "unsatisfactory" in the four age periods mentioned above, was observed in the majority of participants in the comparison group and in subgroups 1 and 2 of the main group. It should be noted that in certain subgroups with high caries intensity (subgroups III and IV), OHI-S index (Green-Vermillion) values were reliably lower than those in the comparison group and indicated "satisfactory" hygienic condition of the oral cavity. The best hygienic condition of the oral cavity in individuals who had signs of intrauterine obesity at birth (subgroups III and IV) can be explained by high motivation of these persons, since they also experienced a high intensity of carious process in temporary occlusion. These data, together with the data average values of OHI-S (Green-Vermillion) indices in groups and subgroups presented in table 2, indicate that it is not only the oral hygiene condition that influences the DEF caries index.

Prevalence of caries in persons of the main group aged 11 - 17 years was 80.8% (CI (confidence interval): 65.1% - 91.0%) versus 78.6% (CI: 57.2% - 91.6%) in the comparison group. Prevalence of caries in the persons of the main group aged 18 to 25 years was 94.9% (CI: 86.5% - 98.4%) versus 85.7% (CI: 71.8% - 93.9%) in the comparison group. For the age group of 25-44 years this index was 100% versus 96.2% (CI: 86.8% - 99.1%) respectively, and for the age group of 44-54 years, the prevalence of caries was 100% both in the main group and in the comparison group. Thus, there was no significant difference in the prevalence of caries between the participants in the main group and the comparison group in all age periods.

The dynamics of caries intensity in the study participants in the aspect of age is illustrated in table 2, which shows index assessment of the hard tooth tissues condition.

It is clear from the table that, in virtually all age periods, the averaged values of the caries intensity indices were greater for persons with intrauterine obesity (subgroups III and IV) compared to the normosomes. Our previous studies have found that in younger children born with intrauterine obesity, against the background of standard body length indices, there were high rates of caries intensity as compared to macrosomes [2]. Whereas in children of subgroup III during the temporary occlusion period, the caries indices were at the level of the comparison group [2], and during the mixed occlusion period they were insignificantly higher than those of the comparison group.

Index assessment of the caries intensity and oral hygiene condition in the study participants:

OHI-S (Green-Vermillion), DEF and (SIC)

Group, age subgroup	Comparison	Main	Subgroup I	Subgroup II	Subgroup III	Subgroup IV
OHI-S, points Age period I	1.74	1.53	1.76	1.72	1.36	1.29
Age period II	1.63	1.39	1.72	1.60	1.26	1.08* (p=0.02959)
Age period III	1.69	1.17* (p=0.00284)	1.79	1.71	1.15* (p=0.00526)	0.68* (p=0.00000)
Age period IV	1.78	1.30	2.13	1.89	1.40	0.83* (p=0.00939)
DEF and (SIC)	3.93	6.00	4.57	7.00	7.50	5.29
Age period I	(7.6)	(11.56)	(6.5)	(8)	(14.5)	(13.5)
A so mania d II	7.11	9.28	7.60	9.50	10.11	9.92
Age period II	(12.2)	(13.92)	(13.3)	(13)	(15)	(16)
	9.92	14.86*	12.1	14.57	15.33*	16.27*
Age period III		(p=0.0005)			(p=0.0075)	(p=0.0002)
	(15.33)	(20.76)	(19.3)	(20.5)	(19.77)	(21.7)
	15.25	19.16*	18.25	17.67	20.6*	19.23*
Age period IV		(p=0.0247)			(p=0.0447)	(p=0.0383)
	(21)	(23.63)	(24.0)	(21.0)	(24.0)	(23.75)

Notes: * difference between the groups of macrosomes and normosomes of the appropriate age (calculated for the indices of HI and DEF) is statistically reliable, error probability at p < 0.05.

In persons with harmonious intrauterine development (subgroup I), although the values of caries intensity indices were averaged and were higher than those in the comparison group, no reliable differences were observed. It should be noted that macrosomes at birth, which were categorized as subgroups with harmonious intrauterine development (subgroup I), had significantly higher rates of caries intensity during the temporary bite period compared to normosomes [2].

It is remarkable that in the participants of this study, the carious cavities are mostly localized on the approximal, buccal and vestibular teeth surfaces (fig. 1), that was also observed in children-macrosomes at birth in the period of temporary [2] and mixed occlusion. Anatomically and topographically small salivary glands are in close contact with the vestibular and buccal surfaces of the teeth and in the immediate proximity to their approximal surfaces. Consequently, there is a natural dependence in the action of small salivary glands particularly on these surfaces. Despite the fact that small salivary glands only produce 10% of saliva, their participation in the anticariogenic protection is significant [1]. In our previous experimental studies, the presence of hypoplastic changes in small salivary glands was proved under the condition of macrosomia at birth [10]. Analyzing the above information it is arguable that disorders in the work of small salivary glands is one of the explanations for such localization of carious cavities.



Fig. 1. Photographic image of the child M's (boy) oral cavity lateral part at the age of 17, macrosomia, *subgroup IV*. Multiple teeth caries with different depth of dental injury.

With age, the averaged amount of small salivary glands secretion reduces in all groups. The results presented in table 3 show that the salivation secretion decrease is the most pronounced in persons of subgroups III and IV. This fact was also observed in children and adolescents born with macrosomia at a younger age [5].

In the participants of the main group in our study, as well as in children, macrosomes at birth, at the age of 6.5 - 11 years and at the preschool age [2, 5], a smaller amount of salivary glands per an area unit was recorded on average. We found the maximum reduction in the number of glands in the subgroups III and IV, and in the previous age periods, the smallest number was observed in

children who had a harmonic intrauterine development (subgroup I). Significant decrease in the number of small salivary glands per an area unit, combined with reliably reduced salivation activity, led to a imbalance between the processes of de- and remineralization towards demineralization and contributed to the carious cavities emergence.

Table 3
Averaged indices of small salivary glands secretion, unstimulated oral fluid secretion and the hydrogen index values of oral fluid in the study participants

Group, subgroup	Comparison	Main	Subgroup I	Subgroup II	Subgroup III	Subgroup IV
Number of small salivary glands per area of 3.5 cm ² Age period I	15.9	13.85* (p=0.0075	15.0	13.5* (p=0.0393)	13.5	13.3* (p=0.0092)
Age period II	14.1	12.28* (p=0.0112	13. 3	12.6	11.8* (p=0.0159)	11.6* (p=0.0104)
Age period III	12.0	10.58* (p=0.0009	11.1	11.00	10.2* (p=0.0136)	10.3* (p=0.0020)
Age period IV	11.6	9.08* (p=0.0005	11.0	11.3	8.0* (p=0.0014)	8.4* (p=0.0001)
Amount of secretion produced by a single small salivary gland, g/min × 10 ⁻⁴ Age period I	1.90	1.61* (p=0.0194)	1.76	1.68	1.50	1.50* (p=0.0162)
Age period II	1.85	1.71	1.86	1.74	1.70	1.58
Age period III	1.59	1.47	1.66	1.46	1.37* (p=0.0424)	1.41* (p=0.0298)
Age period IV	1.20	1.04	1.20	1.20	0.96	0.98* (p=0.0306)
Secretion rate of unstimulated oral fluid, ml/min Age period I	0.59	0.42* (p=0.012)	0.46	0.43* (p=0.0371)	0.41* (p=0.0238)	0.38* (p=0.0037)
Age period II	0.64	0.54	0.52	0.50	0.57	0.55
Age period III	0.62	0.47* (p=0.0024)	0.50	0.51	0.46	0.44* (p=0.0016)
Age period IV	0.47	0.38	0.44	0.40	0.38	0.37
Hydrogen index value (Ph), RU Age period I	6.63	6.61	6.77	6.52	6.55	6.59
Age period II	6.68	6.61	6.72	6.69	6.42	6.61
Age period III	6.65	6.54	6.75	6.74	6.42	6.40
Age period IV	6.76	6.60	6.90	7.33	6.48	6.38* (p=0.0398)

Notes: * difference between the group of macrosomes and normosomes is statistically reliable, error probability at p <0.05.

The rate of unstimulated oral fluid secretion is also significantly lower in persons of subgroups III and IV. Such a decrease in the rate of salivation combined with negative changes in the oral fluid composition leads to the development of carious process [9]. Our previous studies also revealed an impairment in the large salivary glands status in experimental animals that were born with macrosomia [10], compared to animals-normosomes. Extrapolation of these data to the human body can become one of the explanations of the provoked state of hard tooth tissues in individuals – macrosomes at birth.

Shift of the acid-alkaline balance of the oral liquid towards acidity (pH value in table 3) in individuals aged 11 to 17 years is likely to be related to puberty changes. At a later age, the shift towards acidity is also predominantly characteristic of the subgroups III and IV. Despite the high intensity of caries in individuals of these subgroups, the value of the hydrogen index in many participants of the study is unreliably lower than that of the individuals in the comparison group, and in some persons it is even closer to neutral. In our opinion, the development of a carious process in such individuals may be associated with a low mineral density of hard tooth tissues. At younger age, in children of the main group, the hydrogen index was on average lower than that of the children in the comparison group [5].

Thus, the average indices of dental caries intensity in individuals – macrosomes at birth for all the examined age periods were greater than those in the control group. However, if in individuals of subgroups I and II indices of the caries process intensity remained insignificantly higher with age, than in the comparison group, in persons with intrauterine obesity these indices were reliably increased both against the background of average body length indices at birth and on the background of fetal acceleration,. The influence of the oral cavity hygienic status in the persons of the main group on the caries cavities emergence was not detected.

Conclusions

- 1. Calculation of mean indices of caries intensity in the group of individuals macrosomes at birth does not reflect the actual clinical situation. Only a separate analysis of subgroups based on the somatometric indices at birth of the participants under study permits to identify groups of persons with high caries intensity.
- 2. Values of the indices characterizing the caries process intensity at the control level were recorded in individuals with harmonious intrauterine development. The highest values of caries intensity were recorded in individuals who were born with intrauterine obesity against the background of acceleration and in persons with intrauterine obesity against the background of average body length values.
- 3. Individuals who were born with macrosomia have a salivation function impairment compared to those who were normosomes at birth.
- 4. Compared to normosomes, macrosomes at birth have an average by 1 2 units fewer number of small salivary glands per an area unit. Secretion of small salivary glands in individuals macrosomes at birth is also reliably reduced, an average by 11.4%, compared to that in normosomes.

Prospects of further research lie in determination of genetic liability to the oral cavity diseases in individuals whose parameters at birth exceeded the norm.

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Реферати

ЗАЛЕЖНІСТЬ ИНТЕНСИВНОСТИ КАРІЄСУ У ОСІБ ПОПУЛЯЦІЇ ХАРКІВСЬКОЇ ОБЛАСТІ ТА ПРИЛЕГЛИХ ОБЛАСТЕЙ, ЩО НАРОДИЛИСЯ З МАКРОСОМІЄЮ, ВІД ІНДЕКСУ МАСИ ТІЛА ПРИ НАРОДЖЕННІ Гармаш О.В.

Обстежено 220 осіб віком від 11 до 55 років. У 140 осіб, які народились із макросомією, та у 80 осіб відповідного віку та статі, чиї параметри при народженні відповідали нормі, проведено визначення індексів карієсу, оцінено гігієнічний стан ротової порожнини, визначено швидкість слиновиділення змішаної слини та швидкість секреції малих слинних залоз, визначено кількість слинних залоз на фіксованій площі та оцінено стан кислотно-лужної рівноваги ротової рідини. Зроблено висновок, що серед обстежених учасників дослідження, які народились макросомами, у період постійного прикусу найвищі значення показників карієсу були зафіксовані в осіб, які народились із внутрішньоутробним ожирінням. Особи, які народились з макросомією, в середньому, мають достовірно зменшену кількість малих слинних залоз на одиницю площі, зниження швидкості секреції змішаної слини та зниження швидкості секреції малих слинних залоз у порівнянні з особами, чиї параметри при народженні відповідали нормі.

Ключові слова: макросомія плоду, ротова порожнина, постійний прикус.

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ЗАВИСИМОСТЬ ИНТЕНСИВНОСТИ КАРИЕСА У ЛИЦ ПОПУЛЯЦИИ ХАРЬКОВСКОЙ ОБЛАСТИ И ПРИЛЕЖАЩИХ ОБЛАСТЕЙ, РОДИВШИХСЯ С МАКРОСОМИЕЙ, ОТ ИНДЕКСА МАССЫ ТЕЛА ПРИ РОЖДЕНИИ Гармаш О.В.

Обследовано 220 лиц в возрасте от 11 до 55 лет. У 140 участников исследования, родившихся с макросомией, и у 80 лиц соответствующего возраста и пола, чьи параметры при рождении соответствовали норме (нормосомия), проведено определение индексов кариеса, оценено гигиеническое состояние полости рта, определена скорость слюноотделения смешанной слюны и скорость секреции малых слюнных желез, определено количество слюнных желез на фиксированной площади и оценено состояние кислотно-щелочного равновесия ротовой жидкости. Сделан вывод о том, что среди обследованных участников исследования, которые родились макросомами, в период постоянного прикуса наивысшие значения показателей кариеса были зафиксированы у лиц, родившихся с внутриутробным ожирением. Лица, которые родились с макросомией, в среднем, имеют достоверно уменьшенное количество малых слюнных желез на единицу площади, сниженную скорость секреции смешанной слюны и сниженную скорость секреции малых слюнных желез по сравнению с лицами, чьи параметры при рождении соответствовали норме.

Ключевые слова: макросомия плода, ротовая полость, постоянный прикус

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