

International Academy of Science and Higher Education
London, United Kingdom
Global International Scientific Analytical Project



MEMORIAL Hippocrates

MODERN FEATURES OF DEVELOPMENT OF BIOLOGICAL SCIENCE AS FACTORS OF SOLUTION OF PRESSING PROBLEMS OF HUMAN SURVIVAL AND THE NATURAL ENVIRONMENT

Peer-reviewed materials digest (collective monograph) published following the results of the CXIII International Research and Practice Conference and III stage of the Championship in Medicine and Pharmaceutics, Biology, Veterinary Medicine and Agriculture (London, November 19 - November 25, 2015)



**MODERN FEATURES OF DEVELOPMENT OF BIOLOGICAL SCIENCE AS FACTORS
OF SOLUTION OF PRESSING PROBLEMS OF HUMAN SURVIVAL AND THE
NATURAL ENVIRONMENT**

Peer-reviewed materials digest (collective monograph) published following the results
of the CXIII International Research and Practice Conference
and III stage of the Championship in Medicine and Pharmaceuticals, Biology, Veterinary Medicine and Agriculture
(London, November 19 - November 25, 2015)

**The event was carried out in the framework of a preliminary program of the project
“World Championship, continental, national and regional championships on scientific analytics”
by International Academy of Science and Higher Education (London, UK)**

5. Повязка не раздражает слизистую оболочку раневой поверхности.
6. Поддерживает кровоснабжение и поступление кислорода в рану.
7. Не охлаждает и не согревает рану.
8. Не токсична
9. Уменьшает боль и создает комфорт для пациентов
10. Уменьшает сроки лечения на 1/3 от лечения традиционными методами
11. Приятная на вкус
12. Обладает кровоостанавливающими свойствами
13. Положительным экономическим и социальным аспектом курации таких больных.

Суть инновации заключается в пролонгировании действия формообразующих пектиновых веществ на всех этапах курации пациента: гигиеническом, лечебно-профилактическом и реабилитационном.

Перспективы дальнейших исследований в данном направлении. В настоящее время нами продолжаются работы по изучению качественных и количественных биохимических составляющих слюны при воздействии пектиновых веществ на процессы заживления ран после удаления зубов.

Литература:

1. Горленко, А.В. Значение состояния гигиены полости рта в комплексной терапии переломов челюстей [Текст]., В. Горленко, Р.Л. Фурман, И.М. Горленко., Вестник стоматологии. - 2004., No. 3., С. 27-31.
2. Безруков С.Г. Характер микрофлоры содержимого лунок удаленных зубов., С.Г. Безруков, К. Бом, О.Н. Постникова., Вестник стоматологии. - 2009., No. 3., С. 45-49.
3. Tonetti MS, Cigarette smoking and periodontal diseases: etiology and management of disease. Ann Periodontol. 1998 Jul, 3 (1): 88-101.
4. Нонева Н.А. Обоснование применения новых антисептических средств для профилактики и лечения альвеолита: Автореф. дис. на соискание наук, степени канд. мед. наук: спец. 14.01.22 "Стоматология", Н.О. Нонева. – О., 2009. - 20 с.
5. Тимофеев А.А. Руководство по челюстно-лицевой хирургии и хирургической стоматологии. – Киев., 2002., С. 164-180.
6. Терешина Т.П. микробиологические показатели ротовой полости в лиц с угрозой развития альвеолита после операций на альвеолярном отростке., Т.П. Терешина, Н.А. Вареньева, В.В. Лепский., Достижения и перспективы развития современной стоматологии: науч.-практической. конф. с междунар. участием по случаю 80-летия со дня основания Института стоматологии АМН Украины и 50-летия стоматологического факультета ОГМУ, 3-5 апреля 2008: материалы конф. - Вестник стоматологии. - 2008., No. 1., С. 158-159.
7. Маланчук, В.А., Применение биофлавоноидов в комплексном лечении гнойно-воспалительных заболеваний челюстно-лицевой области., В.А. Маланчук, В.И. Бричник., Современная стоматология. - 2004., No.4., С. 90-91
8. Гаврилив Г.М., Антенатальная и постнатальная профилактика кариеса зубов с применением пектинсодержащих веществ: диссертация канд. мед. наук: 14.01.22., Ивано-Франковска гос. медицинская академия. - Ивано-Франковск., 2003.
9. Чекман И.С., Половая Ж.М., Гребельник А.И. Наночастицы в лекарственных формах: аспекты фармакологии и фармацевтической технологии. Фармакология и лекарственная токсикология., No. 1 (26) /2012., С. 3-11
10. Луцкая, И.К., Демьяненко Е.А., Буза Т.П. Применение Солкосерил дентальной адгезивной пасты при лечении гингивита у беременных., Стоматологический журнал., No. 2, 2010., С. 177-179.
11. Doong RL, Mohnen AND. Solubilization and characterization of a galacturonosyl transferase that synthesizes the pectic polysaccharide homogalacturonan. Plant J. 1998; 13: 363-374.
12. Пат. 71254 Украина, МКВ7 А 61 К 31/00. Способ лечения альвеолита гнойно-воспалительных процессов челюстно-лицевой области., С.Н. Шувалов, Н.М. Исаакова, С.Л. Рыбалко; заявитель и патентообладатель Винницкий национальный медицинский университет им.И.Пирогова - № 20031211418; заявл. 11.12.03; опубл. 15.11.04, Бюл. №11.
13. Чекман И.С., Ницак А.В. Нанофармакология: состояние и перспективы научных исследований., Вестн. фармакологии и фармации. - 2007., No. 11., С. 7-10
14. Косенко С.В., Балабан И.О., Гайошко Е.Б., Ильницкая А.М., Яцинович Н.М., Иванов С.А., Музыченко Н.И. Использование пектиновых веществ у больных сахарным диабет 2 типа в комплексном лечении заболеваний тканей пародонта (сообщение 1). - Запорожский медицинский журнал. - 2014., No. 3., С.105-108
15. Косенко С.В., Балабан И.О., Гайошко Е.Б., Ильницкая А.М., Яцинович Н.М., Иванов С.А., Музыченко Н.И. Использование пектиновых веществ у больных сахарным диабет 2 типа в комплексном лечении заболеваний тканей пародонта (сообщение 1). - Запорожский медицинский журнал. - 2014., No. 4., С. 99-103

UDC [615.316-006+616-002.67-008.6]:616-008.843.1-064:548

APPLICATION OF SALIVA CRYSTALLOSCOPY METHODS IN THE DIAGNOSIS OF MALIGNANT TUMOURS OF SALIVARY GLANDS AND SJÖGREN DISEASE

P.A. Moskalenko, Cand. of Medicine, Assistant
Yu.V. Lakhtin, Dr. of Medicine, Associate Prof.
Sumy State University, Ukraine
A.A. Levkov, Cand. of Medicine, Assistant
Ukrainian Medical Stomatological Academy, Ukraine
Yu.V. Smeyanov, Assistant, Postgraduate Student
Sumy State University, Ukraine

Conference participants,
National championship in scientific analytics,
Open European and Asian research analytics championship

A high informational content of saliva crystalloscopy in the diagnosis of salivary glands tumours was proven; typical symptoms of Sjögren disease and malignant tumours of the salivary glands were found on the ground of the analysis of the presented research method.

Keywords: Sjogren disease, saliva, salivary glands tumours, saliva microcrystallization, saliva crystalloscopy.

Introduction. Sjogren disease (SD) – organ-specific autoimmune disease of unknown aetiology, accompanied by the lesions of exocrine glands. Symptoms of xerostomia and xerophthalmia under SD may last for a long time remaining unrecognized, despite of their steady growth. Sjogren syndrome (SS) expresses in lymphoid infiltration of salivary and lacrimal glands, which occurs in 5-25 %% of patients with systemic connective tissue diseases, more often with rheumatoid arthritis, less with systemic lupus erythematosus and other autoimmune diseases.

At the heart of the pathogenic mechanisms of SD/SS is B-cell hyperactivity, that comes out in lymphoid infiltration both secreting epithelial glands and other organs and tissues, in the formation of autoantibodies (RF, ANF, Ro / La) and cryoglobulins with monoclonal RF, and also in the development of predominantly B-cell MALT lymphomas in 5-16% of patients [3].

Diagnostics of salivary gland tumours is provided by a range of measures, the main role of which is in clinical analysis of available to the physician data [10].

One of the most notable trends in medicine in recent years is an active development and implementation in practice of non-invasive methods of diagnosis, defined primarily by the desire to obtain diagnostic information about the most important functions of the body by “bloodless” way and, if possible, without damage of natural barriers [8].

A number of methods of radiation diagnosis of salivary glands diseases were proposed, but they are not widely used in the clinic, because the frequency of diagnostic errors is 19 to 60% [9].

In recent years in clinical medicine the crystallographic research methods of various biological substrates become more widely used. The perspective of these methods use is determined by their high informational content, because the nature of crystallization reflects quite reliably the peculiarities of pathological processes that occur in the body [2, 7]. This allows prompt and early diagnosis of diseases using completely safe method that does not require time-consuming and expensive equipment.

In the available literature, we could not find information on using crystallographic methods for diagnosis of salivary glands tumours, thus the **purpose** of the study was to improve the methods of early diagnosis of lymphoproliferative lesions of the salivary glands of patients with Sjogren disease and malignant tumours using crystallography and crystalloscopy of saliva.

Materials and methods. We observed 12 patients with Sjogren disease, 83.3 % of which have uncomplicated tumours, and 16.7% - compound. We refer to uncomplicated the tumours that was found on the initial stages of SD/SS development, accompanied by lesions of the gastrointestinal tract (reflux, indigestion, diarrhea, constipation), respiratory tract (chronic cough, recurrent bronchitis), kidney (proteinuria, tubular acidosis, interstitial nephritis, glomerulonephritis), other organs and systems (cutaneous vasculitis, peripheral neuropathy, lymphadenopathy, fever of non-infectious aetiology, dental caries, ulceration and clouding of the cornea, chronic infectious and ulcerative processes in the oral cavity and sialoadenitis). In most cases (91.6%%) parotid salivary glands were affected. Control group was 15 boys-recruitees - healthy men.

On patients hospitalization in rheumatologic department we used conventional diagnostic methods, which included a full clinical and laboratory examination, biopsy and salivary glands puncture followed by morphological examination. According to the goal of the research a crystallographic and crystalloscopic examination of pure saliva was conducted after its collection with a Leshle-Krasnogorskyi capsule [11].

To assess a microcrystallization of pure saliva a modified methodology of P.A. Leus was used and its three types were determined [5, 6]:

1st – per field of vision there are big tree-like crystal formations and drops occupying the entire surface;

2nd - prismatic structure in the centre of the drop, as in the first type, but smaller, on the periphery there are irregularly shaped crystals;

3rd - throughout the saliva droplets a large number of irregular crystal structures are seen.

For a complete quantitative characteristics of microcrystals we guided by proposed algorithm [4]. The general background of the agent was studied at low magnification (h40) and microcrystals -was studied at an average magnification (X100) [1]. A detailed description of crystalloscopic presentation was studied at high magnification (h400) according to the following criteria: continuity of main body (**Fig. 1**), the connection of the first order sprout with the main body, the nature of branches tops - sharp or rounded (**Fig. 2**), the width of the main body. Besides the description of microcrystals, organic inclusions were also evaluated (**Fig. 3**): the ratio of their area to the field of view, location (on the periphery, in the centre or around the field); position towards a crystal (sticking or insulation).



Fig. 1. Continuity of main body



Fig. 2. The nature of branches tops - sharp (left) and rounded (right)

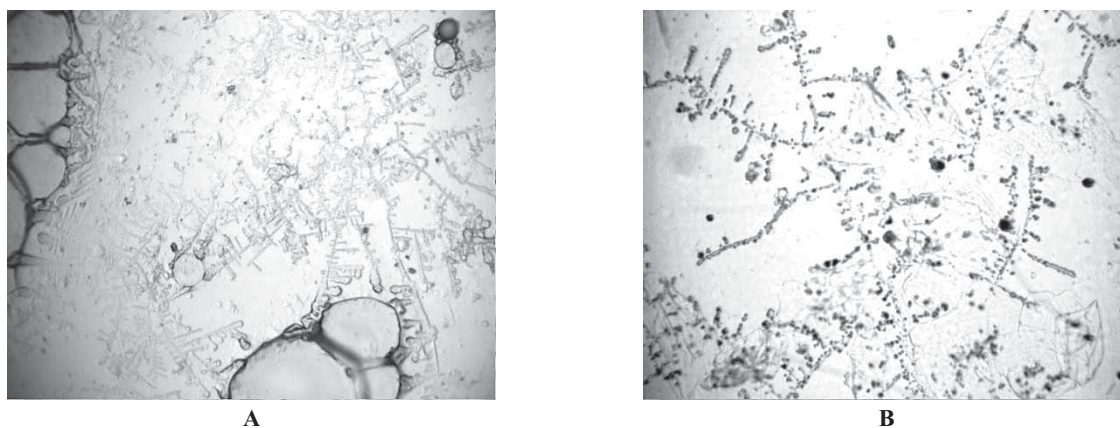


Fig. 3. Organic inclusions: single (A) and multiple (B).

Results and discussion. According to the conclusion of histological laboratory all tumour in patients were represented by B-cell MALT lymphomas.

Data analysis of crystalloscopic picture (table) has shown that in individuals with apparently healthy oral cavity there was formed at least 1-2 kinds of crystals and 13-15 variants of dendritic crystals in saliva, 6 signs of dendritic crystals were always present in crystallogram.

In 60% of patients with Sjogren disease the 3rd type of crystallogram was noted, and 40% has the 2nd type. This indicates on a violation of crystallization properties of saliva in the development of tumours in the salivary glands.

In malignant tumours the 3rd type microcrystallization was determined in 100% of patients. They had the following crystallographic picture of pure saliva: the location of crystallization centres on the surface of a Petri dish were mostly uniform, the number of crystallization centres ranged from 8 to 12 and averaged 10. Rays collected in the form of bundles, the number of which reached 8, proceeded from the centre of crystallization. Kinks and sharp thickening of crystals rays were observed. They become less transparent, in the central part their colour was dark gray, and clearing was closer to the periphery. Rays were deformed by numerous constrictions, interception, which led to their separation and consolidation. Index of average number of crystallization centres is higher in patients compared to crystallograms of healthy persons.

In patients with tumours, on the matted crystallization surface a short needle deformed shape crystals were found. They had a tendency to crystallization centres, whose number ranged from 10 to 20. In the centre of crystallization there was a dark-gray mass, in which, even with a significant increase, it was not possible to find the form of small and large pieces of crystals. This peculiar arrangement of crystals resembled a dark-gray “cruciform” shapes. In the field of crystallization they were located at a considerable distance.

Tab. 1.

Crystalloscopic picture of saliva in healthy persons (P.A. Leus criteria) and patients with Sjogren disease and lymphoma

Structures	Healthy persons	Sjogren disease	Lymphoma
Monocrystalline figures			
Rectangles	4	2	1
Prisms	2	0-1	0
Pyramids	1	0	1
Octahedron	0	1	0
Polycrystalline structures			
Linear	1	2	0-1
Rectangles	0-1	1	0-1
“Moss”	2-3	0	0
“Cross”	0-1	0	0
“Horsetai”	0	6	5-7
“Rosette”	0	0	0
Amorphous bodies			
Size	Medium	Medium	Small
Quantity	Medium	Large	Medium

Conclusions. Thus, when comparing saliva crystallographic pictures of patients with lymphoma and Sjogren disease, the most characteristic for the first one is the formation of a large number of short and wide needle-shape crystals and the presence of so-called cruciform shapes. By most criteria in these patients the distinct crystallographic differences of saliva, compared with healthy individuals, are observed.

Such specific criteria enable to insist on features of crystallographic characteristics of saliva in lymphoproliferative diseases of salivary glands. The use of crystallography and crystalloscopy of saliva on the early stages of the examination of patients with suspected B-lymphoma of salivary gland enables its early diagnosis and differentiation. High research precision, noninvasiveness of this atraumatic method makes possible its wide application in daily work of practicing physicians in outpatient and hospital facilities.

References:

1. Барер Г.М. Кристаллографический метод изучения слюны., Г.М. Барер, А.Б. Денисов. – Москва., ВУНМЦ Росздрава, 2008. – 239 с.

2. Гайфулина В.Р. Микрокристаллизация ротовой жидкости у разных групп пациентов и её компьютерный анализ., В.Р. Гайфулина., Сборник научных студенческих работ «Студенты БГМУ – медицинской науке и здравоохранению Беларуси». – Минск., БГМУ, 2009. - С. 15—16.
3. Городецкий, В.Р. Лимфомы у больных с синдромом Шёгрена., В.Р. Городецкий, В.И. Васильев, Н.А. Пробатова., Росс. мед. жур. – 2003., No. 1., С. 10-13.
4. Денисов А.Б. Алгоритм оценки кристаллических фигур, полученных при высушивании смешанной слюны., А.Б. Денисов., Бюллетень экспериментальной биологии и медицины. - 2004., Т. 136, No. 7., С. 37-40.
5. Леус П.А. Доказательная стоматология как основа программ профилактики кариеса зубов у детей., Стоматология детского возраста и профилактика. - 2008., Том 7, No. 2., С. 3-11.
6. Леус П.А. Клинико-экспериментальное исследование патогенеза, патогенетической консервативной терапии и профилактики кариеса зубов: Автореф. дис. ... д-ра мед. наук. – Москва., 1977. - 30 с.
7. Мартусевич А.К. К раскрытию индикаторной роли кристаллографических методов исследования / А.К. Мартусевич., Естествознание и гуманизм. – 2005., Т. 2, вып. 3., С. 24-27.
8. Мартусевич А.К. Поведение биологических жидкостей и функциональный статус организма человека., А.К. Мартусевич., Известия высших учебных заведений. Поволжский регион. – 2007., No. 2., С. 24-30.
9. Панин М.Г. Дифференциальная диагностика лимфопролиферативных заболеваний у пациентов с болезнью и синдромом Шегрена., М.Г. Панин, С.Ю. Иванов, И.В. Гайдук [и др.]. - Российский стоматологический журнал. – 2006., No. 5., С. 16-20.
10. Постникова И.В. Перспективы применения комплексного кристаллографического исследования биологических жидкостей., И.В. Постникова., Успехи естествознания. – 2007., No. 6., С. 91-92.
11. Уразаева Ф.Х. Пути изучения психофизиологических особенностей состава и свойств слюны., Ф.Х. Уразаева, К.Ф. Уразаев, М.В. Ларина., Современные наукоемкие технологии. – 2009., No. 7., С. 56-59.

