REGIONAL INNOVAIONS ISSN 2273-2640



MEDICAL SCIENCE

MEDICALIZATION OF SOCIETY 52

SPIRITUALITY ANDMEDICINE9

IMMUNOLOGIC MICROARRAYS 21

MEDICAL ETHICS 56

BIOETHICS AND EDUCATION

NEW GENERATION "CYTO-EXPERT" 43

6

COPD PHENOTYPES 25

ROLE OF FRACTALKINE 46

URINARY SYSTEM ORGANS PATHOLOGY 35

BABESIOSIS IN UKRAINE 16

Editorial Board

Editor-in-Chief

Jean-Francois Devemy

President, FranceXP, Paris, France

Editors

Professor Du Hong Wei

Professor of Philosophy, Cultural Scholar, China

Dr Ayesha Ahmad

Lecturer in Global Health, St George's University of London, Honorary lecturer in Global Health, Institute for Global Health, University College London, UK

Dr Tharun Sathyan

Resident doctor, Kiev National Medical Academy, Ukraine.

Lecturer and senior specialist in the field of dental health, clinical dentistry and health administration. Member of the American Academy of Implantology. Indian center for Hospital Administration. India / Ukraine

Professor Iryna Sorokina

Head of the Department of Pathological Anatomy, Kharkiv National Medical University, Ukraine

Professor Tetyana Ospanova

Head of the Department of Propaedeutics of Internal Medicine No. 2 and Nursing, Head of the Committee on Ethics and Bioethics, Kharkiv National Medical University, Ukraine

Dr Mykhailo Myroshnychenko

Associate Professor, Department of Pathological Anatomy, Kharkiv National Medical University, Ukraine

Dr Valentyna Berezenko

Head of the Department of Pediatric Hepatology, National Bogomolets Medical University. Scientific Secretary of the Government Institute of Pediatrics, Obstetrics and Gynecology, National Medical Sciences Academy of Ukraine, Ukraine

Olga Zubkova

Technical Director, Montenegro

ISSN 2273-2640

Regional Innovations is indexed in: Advance Science Index GIF – Global Impact Factor EconPapers Registry of Open Access Repositories IDEAS REPEC OCLC WorldCat RINC Google Scholar

Under evaluation: Ulrich's Periodicals Directory Index Copernicus Scopus

About InterRegioNovation

InterRegioNovation is the International Association devoted to the transfer and exchange of knowledge and innovations at all regional levels (country, region, city, community etc.) between knowledge transfer professionals (business, research institutions, policy makers, government agencies, individuals, others) in all countries of the enlarged Europe, CIS countries and from other continents for stimulating and enhancing economic and social growth in the regions.

This is a policy and research association that brings together all knowledge transfer professionals who are interested in delivering efficient, flexible, innovative and cost-effective services across the private and public sectors. We work closely with business, research and educational institutions, government agencies, policy makers, NGOs, media, individuals and other stakeholders to promote the interests of their industries.

Our members understand the changing needs of the transfer and exchange of knowledge and innovations and through continuous professional development, marketing and networking opportunities offered in this association, we keep current with the latest knowledge trends and issues that challenge people in their work and life journey. We also offer expansive opportunities for partner connection through our networks.

Journal "Regional Innovations" is one of the Association's tools for innovators and everybody who is interested in any aspects of innovation development.



www.irn.center

Contacts:

E-mail: <u>info@irn.center</u> Address: 16, rue de la Roche, Crégy-lès-Meaux, 77124, France Tel. : +33 6 48 18 86 95



About journal

On behalf of the Editorial Board, it gives us a great pleasure to welcome you to the forth issue of 2017 of the Regional Innovations Journal. This is a thematic special issue dedicated to broad aspects of **Medical Science and other innovative research areas** from basic research to clinical and experimental work.

This particular volume provides a platform for advances in basic, translational and clinical research and includes original papers on medical and clinical research, health care innovations, reviews, medical teaching, medical law, medical ethics, spirituality and medicine, policy environmental medicine and integrative general practice. Researchers in academic and clinical settings as well as health professionals are encouraged to publish their theoretical and experimental results in this journal, which aims to integrate expertise in different medical specialties.

This is an independent, peer-reviewed, Internet-based international journal devoted to publishing original research papers of highest quality, sharing ideas and discussing innovation sector within regional dimensions. The journal welcomes to submit research papers by exceptional innovators, leading universities, globally recognized business, government agencies, policy makers and political leaders.

We intend that our readers will be exposed to the most central and significant issues in innovations development. We wish to publish papers that exemplify the highest standards of clarity, and that promise to have significant impact on existing front-line debates or to lead to new ones. The journal explores key priorities of the knowledge and innovations transfer and exchange in terms of critical aspects of human life (economy, law, science, business, health, education, culture etc.). We therefore welcome submissions not only from established areas of research, but also from new and emerging fields and those which are less well represented in existing publications, e.g. engineering studies, biomedical research etc.

We also strive to ensure that being under expert evaluation, each submission will receive developmental and supportive comments to enhance the article. Our refereeing process will involve that each submission will be reviewed by one or more specialists in the relevant field. Articles will be added to the volumes and the journal audience will receive e-mails updates to encourage them to the new articles.

We are delighted with, and immensely grateful to the large numbers of colleagues, both members of the Associations InterRegioNovation and FranceXP (France), representatives from many universities in France, Latvia, UK, Azerbaijan, China, Nigeria, Belarus, Ukraine and other institutions, who have supported the editorial process. And we are very proud of the expertise that they collectively bring, which we believe is unsurpassed by any contemporary innovative journal.

We are immensely grateful to our colleagues for their support and advice through the process of setting the journal up, and for the confidence they have placed in us in supporting this initiative at a time of economic uncertainty.

In the development of the Regional Innovations to date, we would like to enlist the support of a number of organisations who wish to promote this online journal to their experts. To ensure its sustainability, we would also like to invite other organisations, networks, conferences and meetings to associate themselves with the Regional Innovations. We therefore aim for the Regional Innovations to become the leading online forum to globally disseminate outstanding research papers on innovation sector in regional dimensions. Being an online periodical, the Regional Innovations is also a forum for exchange of imaginative ideas readers wish to share. Contributions of articles on innovations sector and your comments about this issue are very welcome.

To this end, if you lead, represent, or are a member of any such organisation, please contact us to offer your support and commit to promoting the Regional Innovations as a publication outlet for research undertaken by your experts.

We do hope you enjoy and benefit from the Regional Innovations! And many thanks for staying with us in 2017!

Jean-François Devemy Editor-in-Chief



Contents

BIOETHICS AS AN IMPORTANT COMPONENT IN TRAINING AND RETRAINING OF MODERN HEALTHCARE PERSONNEL <i>Valery Kapustnyk</i>	6
SIGNIFICANCE OF SPIRITUAL VALUE IN MODERN MEDICAL MECHANISM: THE PHILOSOPHICAL REFLECTION ON HEALTH OF MODERN PEOPLE Du Hongwei	9
REGIONAL AND CLINICAL-EPIDEMIOLOGICAL PECULIARITIES OF BABESIOSIS IN UKRAINE Vitaliy Tsymbaliuk Inna Torianyk Iryna Sorokina	16
USING IMMUNOLOGIC MICROARRAYS FOR DIFFERENTIAL IMMUNOMORPHOLOGIC DIAGNOSTICS OF SOME LYMPHATIC TUMORS Aleksandr Shishkin Nikolay Kiryanov Natalia Ovchinina	21
COPD PHENOTYPES - THE WAY TO PERSONIFIED MEDICINE OF THE XXI CENTURY Tetyana Ospanova Zhanna Semydotska Ingeborg Chernyakova Olena Pionova Nataliia Tryfonova	25
PATHOLOGY OF THE URINARY SYSTEM ORGANS IN CHILDREN POPULATION OF UKRAINE: ITS PAST, PRESENT AND FUTURE Iryna Sorokina Mykhailo Myroshnychenko Nataliia Kapustnyk	35
	1



CYTOANALYTICAL COMPLEX OF NEW GENERATION "CYTO-EXPERT": ITS OPPORTUNITIES AND PROSPECTS Aleksandr Solov'ev Aleksandr Shishkin Nikolay Kiryanov	43	
THE ROLE OF FRACTALKINE IN THE DEVELOPMENT OF INFLAMMATION IN PATIENTS WITH ASTHMA COMBINED WITH DIABETES MELLITUS TYPE 2 AND OBESITY Galyna Yeryomenko Tetyana Ospanova Tetyana Bezditko Olena Vysotska Anna Pecherska	46	
MEDICALIZATION OF THE MODERN UKRAINIAN SOCIETY: PRO ET CONTRA Mykhailo Myroshnychenko Olha Omelchenko Elena Lytvynenko Dmutro Molodan	52	
MEDICAL ETHICS: AN OVERVIEW Ayesha Ahmad	56	
About authors	61	
Requirements for papers	67	
Call for Papers – 2018	68	





PATHOLOGY OF THE URINARY SYSTEM ORGANS IN CHILDREN POPULATION OF UKRAINE: ITS PAST, PRESENT AND FUTURE



Prof IRYNA SOROKINA Professor, Head of the Department of Pathological Anatomy, Kharkiv National Medical University, Ukraine soririna@gmail.

com



Dr MYKHAILO MYROSHNY-CHENKO

Associate Professor, Department of Pathological Anatomy, Kharkiv National Medical University, Ukraine

msmyroshnychen ko@ukr.net



Dr NATALIIA KAPUSTNYK

Associate Professor, Department of Obstetrics and Gynaecology No. 1, Kharkiv National Medical University, Ukraine

naukapathomor phology@ukr.net

Abstract

In order to create a healthy society people must pay due attention to its child population, since children are the future of any nation and no state, which aspires to a rightful place in Europe, will have its future without preservation and strengthening of their health. Pathology of the urinary system organs in children is an urgent problem for the modern Ukrainian society. An important part in the development of pathology of this system in children is played by a damaging effect of maternal pathology, as it was revealed during complex morphological researches conducted at the Pathological Anatomy Department of Kharkiv National Medical University. In order to receive new data about the urinary system organs pathology in children it is absolutely necessary to carry out combined researches using classical morphological methods of investigation and modern molecular-genetic methods, because any conducted research must, firstly, be of practical value and, secondly, have its evolutionary significance.

Key words: children, maternal health, pathology, Ukraine, urinary system organs.



Human health is the highest value, a necessary component of the development and social-economic prosperity of any country, including Ukraine. Today the state of the Ukrainian population health is assessed, unfortunately, as unsatisfactory. This fact is caused, for example, by high levels of mortality and morbidity, low levels of the mean expectedness of life duration and healthy life duration, etc. [1].

In order to create a healthy society people must pay due attention to its child population [2], since children are the future of any nation and no state, which aspires to a rightful place in Europe, will have its future without preservation and strengthening of their health [3]. According to the data of the Global Strategy for Women's, Children's and Adolescents' Health (2016-2030) of the World Health Organization it is clear that investments in children's health have a high economic efficiency and provide the best guarantee to receive a productive workforce in future [4].

The incidence rate and prevalence of diseases are the most important criteria, which characterize the state of health in all age periods [5]. In Ukraine, against a background of a reducing number of its child population

(8003281 children aged 0-17 years in 2011 versus 7614006 children in 2016) the levels of incidence rate and prevalence of diseases remain high: the prevalence of diseases was 198054 in 2011 and 177716 in 2016 per 1000 children of the above age, and the incidence rate was, respectively, 144009 and 131607 [1, 4] (fig. 1). Our analysis of the prevalence of diseases revealed a decrease of this index from 2011 to 2015 and its increase from 2015 to 2016. Having analyzed the incidence rate, we found out its decrease from 2011 to 2012, an increase from 2012 to 2013, a decrease from 2013 to 2014, an increase from 2014 to 2015, and a decrease from 2015 to 2016 (fig. 1).

Our analysis of the incidence rate and prevalence patterns of different diseases in the child population of Ukraine during the period from 2011 to 2016 showed that the urinary system organs pathology within the above period accounted for 2.0-5.0 % [1, 4]. According to the data of the World Health Organization, diseases of the urinary system organs in the incidence rate and mortality patterns of the child population in economically developed countries amount to 2.5-3.0 % [6].



Fig. 1. The dynamics of the incidence rate and prevalence of diseases in children aged 0-17 years in Ukraine within the period from 2011 to 2016 (per 1000 of the above population)



Having analyzed the dynamics of changes in the index of incidence rate of the urinary system organs diseases in Ukrainian children aged 0-17 years, we revealed its decrease from 2011 to 2014, an increase from 2014 to 2015 and a decrease from 2015 to 2016. Our analysis of the index of prevalence of the urinary system organs diseases in the child population of Ukraine showed its decrease from 2011 to 2016 (fig. 2).

The pattern of diseases of the urinary system organs in children of the Kharkiv Region remains virtually

constant during many years. A significant number of cases in the total pathology of the urinary system organs in the child population of the Kharkiv Region within the period from 2007 to 2015 accounted for infections of the urinary system organs (interstitial nephritis, acute and chronic pyelonephritis, infection of the urinary system organs without identification of its localization, acute cystitis), dysmetabolic nephropathy, congenital system malformations of the urinary organs. vesicoureteral glomerulonephritis, reflux and neurogenic dysfunction of the bladder [7] (table 1).



Fig. 2. The dynamics of the incidence rate and prevalence of the urinary system organs diseases in Ukrainian children aged 0-17 years during the period from 2011 to 2016 (per 1000 of the above population)

Pathology of the urinary system organs in children is known to be of a polyetiologycal character. Owing to a rapid development of science the range of damaging factors, which form the basis for development of different pathology of the above system in children, widens from year to year, thereby resulting in a change of our conceptions about the essence of the diseases. The main etiopathogenetic factors, which cause the development of the urinary system organs pathology in children, include bacterial and viral infections, drug damages, bad habits, metabolic disturbances, hereditary and environmental factors, and many others [6].

It is generally recognized at present that the foundation of human health is laid during the intrauterine period, the cause-effect relationship between the morbidity of pregnant women and their children is undoubtful. Many diseases of the urinary system organs in children appear during the antenatal, intranatal or postnatal periods of their development. It is known that damages of the urinary system organs, which developed antenatally, can become evident some years or even decades later rather than immediately after the birth [8].



Name	Year												
of the pathology	2007	2008	2009	2010	2011	2012	2013	2014	2015				
Urinary system organs infections	46.39	38.25	41.50	49.17	43.21	48.79	48.79	29.06	31.33				
Congenital malformations													
of the urinary system	7.03	19.97	18.70	7.86	6.87	10.11	11.27	31.14	28.43				
organs													
Dysmetabolic	26.94	27 30	16.18	22.94	25.61	15 52	15.48	16.32	18 34				
nephropathy	20.74	27.50	10.10	22.74	25.01	15.52	15.40	10.52	10.54				
Glomerulonephritis	6.89	4.66	7.24	7.62	7.88	9.33	7.46	9.98	10.03				
Vesicoureteral reflux	8.28	6.96	9.57	6.43	6.97	6.14	5.22	4.33	4.09				
Neurogenic dysfunction	2.42	2.42	1.62	3 15	3 36	2 71	2 71	3 53	3 34	2 01			
of the bladder			2.42	1.02	5.15	5.50	2.71	2.71	5.55	5.54	2.71		
Chronic renal	1.12	1.12	1 1 2	1.12	1.12	0.75	1.00	1.54	2 71	4.27	1.88	2.04	3 3 2
insufficiency			0.75	1.90	1.54	2.71	4.27	4.00	2.74	5.52			
Urolithiasis	0.33	0.08	0.82	0.28	2.82	2.35	2.57	1.85	1.19				
Acquired renal cysts	0.60	0.41	0.94	0.80	1.12	0.54	0.46	0.29	0.06				
Lupus nephritis	-	-	-	-	0.05	0.24	0.34	0.46	0.12				
Hemolytic uremic		_	_		0.05	_		0.17	0.12				
syndrome	_	_			0.05	_		0.17	0.12				
Wilms tumor	—	_	_	_	_	_		0.12	0.06				

The proportion (%) of different diseases in the total pathology of the urinary system organs in children of the Kharkiv Region within the period from 2007 to 2015

Very important for prevention of health problems in children is development of methods of prognosis and early diagnosis of these disorders [9]. We have singled out such risk factors for the development of pathology of the urinary system organs in children of the Kharkiv Region as a reduced body weight and length of the baby at birth, a late initiation of sex by the mother, the female sex of the baby, smoking of its parents, presence of abortions in the mother's case history, complications (placental insufficiency during pregnancy and preeclampsia) and delivery (placental abruption and abnormal labour activity), presence of genital and extragenital pathology in the mother (diseases of the urinary system) [10, 11]. On the basis of the above risk factors we derived the formulae, with whose help it is possible to prognosticate both the development of pathology of the urinary system organs in children and its character (congenital or acquired).

An important part in the establishment of concepts concerning the morphofunctional basis of diseases of the urinary system organs in children is paid by pathological anatomy. As it is known, practical and scientific pathological anatomy has passed three main stages of its development, during which the main methods of the morphological perception of pathological processes were successively improved: (XVI-XVIII macromorphological centuries). microscopic (the end of XVIII - the first half of XX

century) and molecular-genetic (since 1970s of XX century) [12].

Despite the appearance of new morphological methods of research the concept of a damaging effect of the mother's pathology on the urinary system organs of her foetus and newborn has not lost its urgency; it is supplemented with more and more new confirming facts, which we revealed as a result of our morphological studies on clinical and experimental materials.

Preeclampsia (PE) belongs to serious complications of pregnancy. Our macroscopic examination of the kidneys of foetuses and newborns from the mothers, whose pregnancy was complicated with severe PE, revealed a more marked lobulation. Mild and moderate degrees of PE severity in mothers do not produce any effect on the degree of expression of embryonic lobulation of the kidneys in foetuses and newborns.

Our organometric study showed that in foetuses and newborns from the mothers, whose pregnancy was complicated with a mild degree of PE severity, the mass of the left kidney significantly prevailed over that of the right one; the same fact was also observed in foetuses and newborns from mothers with physiological pregnancy. In case of development of moderate and severe degrees of PE severity in the mothers we did not reveal any significant differences between the mass of



the left and right kidneys in the foetuses and newborns. The length, width and thickness of the right and left kidneys both in the foetuses and newborns did not differ significantly in case of development of different degrees of PE severity in their mothers.

The revealed organometric indices of the kidneys (their mass, length, width and thickness) were significantly larger in the newborns versus the foetuses in cases, when their mothers' pregnancy was complicated with mild and moderate degrees of PE severity. In case of development of severe PE in mothers the organometric indices of the kidneys of their foetuses and newborns did not differ significantly.

In the course of our research we made a conclusion that PE with a moderate degree of severity and especially severe PE in the mothers inhibit the growth of the kidneys in their foetuses and newborns, as it is demonstrated by significant decreases of the mass, length, width and thickness of these organs. PE with a mild degree of severity in the mothers does not produce any effect on the organometric indices of the kidneys in their foetuses and newborns.

Our publications mentioned such structural changes in the ureters and bladder of the foetuses and newborns from the mothers, whose pregnancy was complicated with PE, as: pronounced dystrophy of urotheliocytes; damaged myoarchitectonics in the form of thinning of the muscular layer, separation of muscle bundles with connective tissue fibers, sclerosis development; haemodynamic and ischaemic changes [23].

Iron deficiency anaemia (IDA) is a common complication of pregnancy; according to the data of the World Health Organization its rate in different countries of the world ranges from 21 % to 80 % if assessed by the level of haemoglobin and from 49 % to 99 % if assessed by the level of serum iron [13].

In the course of our studies on autopsy material we revealed that IDA, which complicated the course of pregnancy in the mothers, was a damaging factor with resultant structural changes in the ureters of the foetuses and newborns, the degree of manifestation of the above changes increasing from the foetus to the newborn as well as in case of an increasing degree of IDA severity. Structural changes in the ureters of foetuses and newborns, caused by the presence of IDA in their mothers, developed in all layers of the organ walls. The epithelial layer revealed its "loosening" with disordered layer-by-layer structuredness and development of dystrophic, desquamate and atrophic changes resulting in a decrease of its thickness. But against a background of the above changes the foetuses, whose mothers had IDA with a mild degree of severity, developed focal compensatory intensification of proliferative activity in

their epithelium and, as a total result, its thickness increased. Dyscirculatory and sclerotic changes developed in the in the lamina propria of the mucous membrane, submucosa and adventitia, thereby causing an increased thickness of these structural components of the ureter. There were haemodynamic disturbances and atrophic-sclerotic changes in the muscular layer, whose thickness increased. We drew a conclusion that the revealed structural changes in the ureter could result in its functional inferiority [14].

Oxygen deficit (hypoxia) is the most important damaging factor, which affects even the further development of the child rather than the state of health of the foetus and newborn only. Hypoxia develops as a result of genital and extragenital pathologies in mother and accompanies the majority of obstetric complications [15].

During our experimental studies with modelling of chronic intrauterine hypoxia (CIH), acute postnatal hypoxia (APH) and mixed hypoxia (MH) in WAG rats we saw that APH caused a moderately pronounced, while CIH and MH caused pronounced capillary congestion, microfocal haemorrhages in the renal corpuscles, epithelial desquamation in the parietal layer of the capsule, the above changes increasing from the foetus to the newborn in the case of CIH modelling. Morphometric study revealed that CIH and MH caused a decreased number of glomeruli in the kidneys of foetuses and newborns as well as slower rates of maturation of renal corpuscles; APH did not affect quantitative indices of the glomerular apparatus of the foetuses and newborns kidneys [16].

Our previous immunohistochemical study revealed that experimental hypoxia induced apoptotic processes in the kidneys, ureters and bladder of foetuses and newborns, whose degree of expression was moderate in the case of APH modelling, marked in CIH modelling and severe in MH modelling. Under the influence of APH, CIH and MH in the ureters and bladder of the foetuses and newborns p53-positive cells were evenly located in all wall layers of these organs, whereas in the kidney cells expressing p53 prevailed in the tubular component. We also observed that in the case of CIH apoptotic processes in the kidneys, ureters and bladder increased in newborns versus foetuses, while in intact animals the apoptotic activity decreased from the foetus to the newborn [17].

We showed that CIH and MH in newborns resulted in a significant decrease of the index of the mean value of the muscle fiber thickness in the muscular layer of the ureter and bladder as well as in an uneven expression of smooth muscle actin by cells of the muscular layer in these organs. APH did not produce any damaging effect on qualitative and quantitative characteristics of the



muscular layer of the ureter and bladder in newborns. In newborns APH did not affect indices of the mean value of the muscle fiber thickness in arterioles and venules of the kidneys, ureters and bladder, while CIH and MH resulted in a significant decrease of the above indices. CIH and MH increased the degree of manifestation of smooth muscle actin expression by myofibroblasts in the kidneys, ureters and bladder, by mesangiocytes and epithelial cells of glomeruli as well as by epithelial cells in renal tubules that later can develop sclerotic changes in these organs in such children at different stages of ontogenesis [18].

It is known that kidney diseases in children can be accompanied with evident symptoms or pass with minimal clinical manifestations. Some renal diseases in children may be asymptomatic for a long period of time. In modern nephrology, renal biopsy is the "gold" standard that makes it possible to receive material for a histological study of the renal tissue and, using histological, histochemical, immunohistochemical, morphometric methods and electron microscopy, make a morphological diagnosis, which will enable the clinician to take correct therapeutic measures [19].

Nevertheless the morphological methods of research, used in Ukraine, sometimes become insufficient for verifying different variants in the course of renal pathology in children. As the way out of the current situation it is important to put into practice moleculargenetic methods of research [22], without which it is impossible in some cases to make the correct morphological and, consequently, clinical diagnosis and hence to treat the patient. A better diagnosis of nephrotic syndrome in children owing to moleculargenetic methods of research is a convincing example.

The study of causes for development of nephrotic syndrome is associated with researches that assess the state of proteins in the slit membrane of podocytes, namely reveal mutations in the genes, which encode these proteins. For example, nephrin is one of the important protein of the slit membrane. Mutations in the family of nephrin proteins – NEPH1, NEPH2, NEPH3 – develop to congenital nephrotic syndrome, which is characterized by resistance to steroid therapy. Another important role in the development of nephrotic syndrome is played by the membrane protein podocin, which is encoded by the NPHS2 gene located in chromosome 1 on 1q25-q31 region. Histological studies of renal biopsies in such patients diagnose, as a rule, focal segmental glomerulosclerosis [20].

Improvement of methods for diagnosing any pathology in the human organism, including pathology of the urinary system organs, results from the modern development of different sciences. As far as the wellknown theory of formation of diseases, the theory of pathology, is concerned, it was formulated in 1849 in works by Carl von Rokitansky and Rudolph Virchow. They created this theory at the time, when there were not so many methods of research as now. Is it not for this reason that the information, which can be received by modern methods of study, is sometimes perceived in the clinical practice so aloof? Therefore a discussion was aroused in the medical community about a necessity to form a new theory of pathology, the theory of XXI century [21].

Thus, pathology of the urinary system organs in children is an urgent problem for the modern Ukrainian society. An important part in the development of pathology of this system in children is played by a damaging effect of maternal pathology, as it was revealed during complex morphological researches conducted at the Pathological Anatomy Department of Kharkiv National Medical University.

In order to receive new data about the pathology of the urinary system organs in children it is absolutely necessary to carry out combined researches using classical morphological methods of investigation and modern molecular-genetic methods, because any conducted research must, firstly, be of practical value and, secondly, have its evolutionary significance.



References

- The annual report about the state of the population's health, sanitary-epidemiological situation and operating results of the system of health protection in Ukraine. 2015 / Ed. by Shafransky V.V.; Ministry of Health of Ukraine, Government Agency "Ukrainian Institute for Strategic Studies". – Kyiv, 2016. – 452 p.
- Mashina N.S. Health status of infants and its determining factors / N.S. Mashina, M.Yu. Galaktionova // Siberian Medical Review. – 2015. – No 2. – P. 26-31.
- Indices and social context in the formation of adolescents' health: A monograph / O.M. Balakireva, T.V. Bondar, D.M. Pavlova et al.; ed. by O.M. Balakireva. – K.: UNISEF, Ukrainian Institute for Social Research after Oleksandr Yaremenko. – K., 2014. – 156 p.
- The annual report about the state of the population's health, sanitary-epidemiological situation and operating results of the system of health protection in Ukraine. 2016 / Ministry of Health of Ukraine, Government Agency "Ukrainian Institute for Strategic Studies". – Kyiv, 2017. – 516 p.
- Panchyshyn N.Ya. Morbidity of the child population of Ukraine and the factors, which produce their effects on children's health / N.Ya. Panchyshyn, V.L. Smirnova, O.Ya. Halytska-Kharkhalis // Urgent Problems of Paediatrics, Obstetrics and Gynaecology. – 2011. – No. 2. – P. 131-132.
- 6. Inogamova V.V. Risk factors of diseases of the kidneys and urinary tract in modern conditions / V.V. Inogamova, Z.Sh. Giyasova // Young Sceintist. 2016. No. 10 (114). P. 486-490.
- The nosological pattern of pathology of the urinary system organs in the child population of the Kharkiv Region / G.R. Muratov, T.F. Kolibaeva, M.A. Gonchar, I.V. Sorokina, M.S. Myroshnychenko // Problems of Continuous Medical Education and Science. – 2016. – No. 3 (23). – P. 22-28.
- 8. Ignatova M.S. Urgent problems of paediatric nephrology in the beginning of XXI century / M.S. Ignatova // Paediatrics. 2007. Vol. 86, No. 6. P. 6-13
- 9. Lukyanova Ye.M. Medcial and pedagogical aspects in the problem of preservation of children's health / Ye.M. Lukyanova // International Medical Journal. 2003. No. 3. P. 6-9.
- Risk factors of the development of the urinary system organs in the child population of the Kharkiv Region / I.V. Sorokina, M.S. Myroshnychenko, N.V. Kapustnyk, A.V. Arsenyev // Congress "Prevention. Anti-Aging. Ukraine". Congress materials. – Kharkiv. – September 28-29, 2017. – P. 12-13.
- 11. Peculiarities in the course of pregnancy in the mothers, whose children had pathology of organs of their urinary tract system / M.A. Gonchar, G.R. Muratov, T.F. Kolibaeva, I.V. Sorokina, M.S. Myroshnychenko // West Kazakhstan Medical Journal. 2016. 3 (51). P. 56-61.
- Pathomorphology: The national textbook / V.D. Markovskiy, V.O. Tumansky, I.V. Sorokina et al.; ed. by V.D. Markovskiy, V.O. Tumanskiy. – K. : All-Ukraine Special-Purpose Publishing House "Medicine", 2015. – 936 p.
- Kulakov V.I. Iron deficiency anaemia and pregnancy / V.I. Kulakov, V.N. Serov // Women's Health. 2015. No. 9 (105). – P. 21-24.
- Iron deficiency anaemia in the mother, complicating the course of pregnancy, as the factor that results in structural changes in the ureters of her offspring / I.V. Sorokina, M.S. Myroshnychenko, N.V. Kapustnyk, S.A. Sherstiuk, S.A. Nakonechna // Development and modernization of medical science and practice: experience of Poland and prospects of Ukraine: Collective monograph. Vol. 3. Lublin: Izdevnieciba "Baltija Publishing", 2017. – P. 209-223.
- 15. Andreeva A.A. Nitric oxide production in the newborns, who survived intrauterine hypoxia / A.A. Andreeva , T.I Oparina // Journal of Obstetrics and Gynaecological Diseases. 2010. No. 26. P. 30-34.
- Morphological peculiarities in the renal glomerular apparatus of foetuses and newborns in modelling different hypoxias / I.V. Sorokina, V.D. Markovskiy, I.V. Borzenkova, M.S. Myroshnychenko, O.N. Pliten // Morphology. – 2016. – Vol. 10, No. 3. – P. 267-272.
- Pathogenically induced apoptosis, caused by hypoxic influence, in organs of the urinary system of foetuses and newborns (an experimental research) / M.S. Myroshnychenko, S.A. Sherstiuk, Ye.O. Zubova, S.A. Nakonechna // Georgian Medical News. – 2017. – No. 9 (270). – P. 94-99.
- Sorokina I.V. The features of smooth muscle actin expression in the kidneys, ureters and bladder of the newborns exposed to chronic intrauterine, acute postnatal and mixed hypoxia / I.V. Sorokina, M.S. Myroshnychenko, I.V. Korneyko // The New Armenian Medical Journal. – 2017. – Vol. 11, No. 2. – P. 33-39.
- Snigur G.L. Significance of modern methods of pathohistological study in diagnosing renal diseases / G.L. Snigur, A.V. Smirnov, M.V. Schmidt // Volgograd Scientific Medical Journal. – 2014. – No. 4. – P. 43-47.
- 20. Molecular nephropathology: new abilities for diagnosing renal diseases / S.L. Morozov, V.V. Dlin,



V.S. Sukhorukov, A.S. Voronkova // Russian Herald of Perinatology and Paediatrics. – 2017. – No. 62 (3). – P. 32-36.

- 21. Titov V.N. One and half century after C. Rokitansky's humoral theory and R. Virchow's cell theory: the phylogenetic theory of pathology / V.N. Titov // Nephrology. 2012. Vol. 16, No. 4. P. 11-27.
- 22. Ignatova M.S. The role of genetics in the development of paediatric nephrology / M.S. Ignatova, V.V. Dlin // Russian Herald of Perinatology and Paediatrics. 2015. No. 3. P. 6-9.
- Myroshnychenko M.S. Pathomorphological peculiarities of the ureter and bladder in foetuses and newborns from mothers with complicated pregnancy / M.S. Myroshnychenko, D.A. Feldman // V International Youth Medical Congress "St. Petersburg Scientific Readings – 2013". Congress materials. – St. Petersburg. – December 4-6, 2013. – P. 203.

