



Ukrainian Journal of Nephrology and Dialysis

Scientific and Practical, Medical Journal

Founders:

- State Institution «Institute of Nephrology NAMS of Ukraine»
- National Kidney Foundation of Ukraine

ISSN 2304-0238;
eISSN 2616-7352

Journal homepage: <https://ukrjnd.com.ua>

Original Papers

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doi: 10.31450/ukrjnd.1(73).2022.05

Acute cystitis in children: age and regional features in Ukraine

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Citation:

Saidakova N, Shulyak O, Klys A., Kononova G, Hrodzinkiyy V. Acute cystitis in children: age and regional features in Ukraine. Ukr J Nephrol Dial. 2022;1(73): 43-50. doi: 10.31450/ukrjnd.1(73).2022.05.

Article history:

Received December 09, 2021

Received in revised form
December 25, 2021

Accepted December 27, 2021

Abstract. *The present study aimed to evaluate the dynamics of the incidence of acute cystitis in Ukrainian children in the regional aspect.*

Methods. *The primary documentation is presented by the data of state and branch statistical reports of the institutions of the Ministry of Health of Ukraine for 2013-2017. There are age periods - children under 14 and 15 - 17 years. The indicators were analyzed for Ukraine as a whole, five of its regions, and the regions that make them up.*

Results. *At stabilization of morbidity of children till 14 years which specific weight reaches 70%, annual growth of sick teenagers (on 28,0% from 2013 to 2017) is noted.*

Conclusioni. *Administrative areas have been identified that require increased attention from health authorities and clinicians to develop appropriate measures.*

Keywords: *acute cystitis, pediatric population, regions.*

Conflict of interest statement. The authors declare no competing interest.

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УДК 616.62-002.1-053.2/.7(477)

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Гострий цистит у дітей: повікові та регіональні особливості в Україні

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Резюме. Метою роботи було вивчення динаміки захворюваності дитячого населення на гострий цистит в регіональному аспекті.

Методи. Вивчення захворюваності дитячого населення на гострий цистит відбувалося за даними офіційної статистики за п'ять років (2013 – 2017 рр.) в аспекті адміністративних територій України. Розглядалися повікові категорії дітей до 14 та 15 – 17 років.

Результати показали, що при відносній стабілізації зареєстрованих дітей, хворих на гострий цистит, переважна їх більшість представлена віковою групою до 14 років і лише кожний третій випадок приходився на підлітків. При цьому, на відміну, серед останніх характерним було щорічне зростання на більшості територій (на 2,3% до 6619 проти на 0,3% до 14518). В Західному, Центральному, Південно-Східному регіонах зосереджено 94,3% та 93,0% дітей до 14 років та підлітків відповідно. Рівні захворюваності на гострий цистит (в розрахунку на 1 тис. відповідного нас.) дітей до 14 років при незначній тенденції до зменшення коливалися від 2,16 до 2,26 (в середньому становили за 5 років $2,2 \pm 0,01$) і були 2,2 – 3,4 рази менші за показники серед підлітків, які щорічно зростають (на 28,0% з 2013 р. до 2017 р. і становили 6,13; в середньому $5,38 \pm 0,2$).

Висновок. Виявлено 15 областей України, що виділяються поміж інших за високими показниками захворюваності на гострий цистит дітей як до 14 років, так й підлітків, що потребує підвищеної уваги першочергово в з'ясуванні причин та прийняття відповідних заходів (Вінницька, Київська, Волинська, Івано-Франківська, Львівська, Рівненська, Тернопільська, Чернівецька, Дніпропетровська, Кіровоградська, Харківська, Миколаївська, Одеська).

Ключові слова: гострий цистит, дитяче населення, регіони.

Introduction. The problem of maintaining the health of children against the background of consistently unfavorable indicators, when deviations in their health are becoming more common and pronounced, is becoming a relevant, important task of all government agencies, institutions, public organizations and society as a whole [1-3]. Acute infectious and inflammatory diseases endured in childhood should be considered predictors of a number of other diseases in the later age period at the stages of reproductive and working-age [4-7]. In this aspect, urinary tract infections are of interest as one of the most important problems of modern urology, and, in particular, acute cystitis, which is the most common manifestation [8-10]. In most cases, the infection is of ascending character, mainly affects the kidneys, and in clinical outpatient practice, patients with acute cystitis are not significantly inferior in the frequency of treatment of acute pyelonephritis. Its tendency to recur, as a feature of the clinical course, complicates the situation [11, 12]. The disease takes a chronic form with all its known negative manifestations, complications, consequences [11, 14]. As a result, they

cause frequent visits to doctors, lead to a sharp decrease in physical and psycho-emotional activity, leave their mark on the quality of life. In fact, the above category of patients needs long-term medical and social care [11, 13, 14]. Therefore, detailed information on common diseases with the progressive and disabling course is usually important. Under such conditions, the need for systematic monitoring, assessment of the dynamics of those diseases in childhood, which can predict the prevalence of chronic diseases in the future, and thus timely focus on optimizing prevention, development and implementation of effective health technologies.

This study aimed to evaluate the dynamics of the incidence of acute cystitis in children in the regional aspect.

Materials and Methods. The paper presents an analysis of the incidence of acute cystitis (AC) in children based on a study of official statistics for 2013 – 2017. A feature was the allocation of two age periods – children under 14 and 15 – 17 years. The dynamics of absolute and intensive indicators (per 1000 relevant population) were studied both in Ukraine as a whole and in five regions and oblasts that are part of them (Western, Central, Northeastern, Southeastern, Southern). During processing dynamic series, a standard set of indicators was involved: absolute increase (decrease), growth rate (decrease), coefficient of visibility. For comparative analysis, the mean values with their errors were calculated, and in determining their differences – the Student's test criterion.

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Results. The dynamics of the total number of children registered in Ukraine with acute cystitis during 2013 - 2017 in the regional aspect are presented in Table 1.

Table 1

Dynamics of the number of children with acute cystitis, taking into account their age

Regions	0 - 17					x T p/z %
	years					
	2013	2014	2015	2016	2017	
Western	9603	9461	9330	9298	9441	-1,7
Central	4599	4605	4564	4232	4460	-3,0
North-East	750	789	676	735	705	-6,0
South-East	3908	3202	3468	3870	4016	+2,8
South	1679	1807	1765	1870	1935	+15,2
Kyiv	383	467	475	496	580	+51,4
Ukraine	20952	20261	20278	20501	21137	+0,9
Regions	0 - 14					x T p/z %
	years					
	2013	2014	2015	2016	2017	
Western	7254	7122	7066	6941	7024	-3,1
Central	3151	3121	3137	2812	2950	-6,4
North-East	530	580	480	483	512	-3,4
South-East	2338	2083	2192	2444	2590	+10,8
South	997	1035	1033	1083	1133	+13,6
Kyiv	210	232	251	262	309	+47,1
Ukraine	14480	14103	14159	14025	14518	+0,3
Regions	15 - 17					x T p/z %
	years					
	2013	2014	2015	2016	2017	
Western	2349	2339	2264	2357	2417	+2,9
Central	1448	1484	1427	1420	1510	+4,3
North-East	220	209	196	252	193	-12,3
South-East	1570	1119	1276	1426	1426	-9,2
South	682	772	732	787	802	+17,6
Kyiv	173	235	224	234	271	+56,6
Ukraine	6472	6158	6119	6476	6619	+2,3

T p/z - growth rate (decrease); in %.

Apparently, it was quite stable among children 0-14 and 15-17 years old. The slight tendency to increase them (by 0.9% to 21137 in 2017), which was observed last year, was more pronounced among adolescents (by 2.3% to 6619 and only by 0.3% to 14518 among children under 14 years). From the given data the advantage (in 2.2 times) of patients at the age of 14 years is traced. It continues in each region and ranges from 1.1 (the capital) to 3 times (Western region). The defined general picture of the whole country consists of features of changes in regions. Thus, the number of registered children (0-17 years) decreased in the Western

(by 1.7%), Central (by 3.0%), North-Eastern (by 6.0%) regions and increased by 2.8% in the South-East, 15.2% in the South and 51.4% in Kyiv. In the structure of the distribution of sick children with acute cystitis, which is presented in Table 2, we find confirmation that the vast majority of them during the study period are concentrated in the Western region (in 2017 - $44.7 \pm 0.2\%$), the second and third places were occupied by Central and Southeastern (22.2 ± 0.3 and $19.0 \pm 0.3\%$, respectively), the rest were successively occupied by the South ($9.1 \pm 0.2\%$), the North-East ($3.3 \pm 0.1\%$) and Kyiv ($2.8 \pm 0.1\%$).

Table 2

Dynamics of the regional distribution structure of children with acute cystitis

Regions	0 - 17				
	%+m	%+m	%+m	%+m	%+m
	2013	2014	2015	2016	2017
Western	45,8±0,1	46,7±0,3	46,0±0,3	45,4±0,3	44,7±0,3
Central	22,0±0,2	22,7±0,3	22,5±0,3	20,6±0,3	22,2±0,3
North-East	3,6±0,1	3,9±0,1	3,3±0,1	3,6±0,1	3,3±0,1
South-East	18,6±0,3	15,8±0,2	17,1±0,3	18,9±0,3	19,0±0,3
South	8,0±0,2	9,0±0,2	8,7±0,2	9,1±0,2	9,1±0,2
Kyiv	1,8±0,09	2,3±0,1	2,3±0,1	2,4±0,1	2,8±0,1
Ukraine	100,0	100,0	100,0	100,0	100,0
Regions	0 - 14				
	%	%	%	%	%
	2013	2014	2015	2016	2017
Western	50,1	50,5	50,0	49,5	48,4
Central	21,8	22,1	22,1	20,0	20,3
North-East	3,7	4,1	3,4	3,4	3,5
South-East	16,1	14,8	15,5	17,4	17,8
South	6,7	7,3	7,3	7,7	7,8
Kyiv	1,4	1,6	1,8	1,9	2,1
Ukraine	100,0	100,0	100,0	100,0	100,0
Regions	15 - 17				
	%	%	%	%	%
	2013	2014	2015	2016	2017
Western	36,3	38,0	37,0	36,4	36,5
Central	22,4	24,1	23,3	22,0	22,8
North-East	3,4	3,4	3,2	3,9	2,9
South-East	24,3	18,2	20,9	22,0	21,5
South	10,5	12,5	12,0	12,2	12,1
Kyiv	2,7	3,8	3,7	3,6	4,1
Ukraine	100,0	100,0	100,0	100,0	100,0

According to the comparative analysis of the data of the selected two age groups of children, several features are crystallized. Thus, with the similar following sequence of distribution of leading places of registered sick children 0 - 14 and 15 - 17 years, which account for 94.3% and 93.0%, respectively (Western, Central, South-Eastern, Southern), the dynamics of their changes have differences. A more pronounced growth rate (+ 2.3% vs. + 0.3%) of adolescents is due to an increase in cases in four

administrative territories (Western by 2.9%, Central by 4.3%, Southern by 17.6%, Kyiv by 56.6%), while in the other age category in three – Southeast (10.8%), South (13.6%) and the capital (47.1%). In order to reduce the leveling of random deviations in individual years for generalization, to identify the main typical feature, the average values of the number of patients by region were calculated, as they cover the features present in the observation group (Table 3).

Table 3

The average values of the total number of patients with acute cystitis by regions (M ± m); 2013 – 2017

Regions	0 – 17 years	0 – 14 years	15 – 17 years
Western	9426±49,1	7081±44,6	2345±22,2
Central	4492±62,0	3034±60,4	1458±15,6
Northeast	731±16,3	517±16,6	214±7,5
Southeast	3693±140,0	2329±81,5	1363±64,0
Southern	1809±41,0	1086±25,2	755±19,7
Kyiv	480±35,1	253±14,5	227±14,4
Ukraine	20626±162,0	14257±92,0	6369±89,0

The results of Table 3 confirm the above-mentioned similarity or difference of regional processes observed during five years in the context of two age periods of children with acute cystitis. It is only necessary to add that the situation in Ukraine is formed by three regions (Western, Central, South-Eastern), in which the most patients with acute cystitis are concentrated, namely at the age of 0 - 14 years 87.3%, 15 - 17 years – 81.1%.

In this context, data on the oblasts that make up each region are of interest. It was found that the vast majority of them in the West accounted for Lviv, Ternopil, Chernivtsi oblasts (up to 14 years - 73.7%, adolescents

- 61.6%), in Central - Vinnytsia and Kyiv (61.5% and 70.5%, respectively), in the South-East – Dnipropetrovsk, Kharkiv (58.7% and 68.0%), in the South - Odesa, (52.0% and 64.5%, respectively). As a result, in 2017, 11,468 out of 21,137 (54.7%) children with this disease were concentrated in the eight oblasts listed above, including 7,436 (35.2%) and 4,032 (19.5%), respectively, under the age of 14 and 15 - 17 years. The results of studying the dynamics of the incidence of children with acute cystitis in the age aspect by region per 1000 of the relevant population are different, which is obvious from Table 4.

Table 4

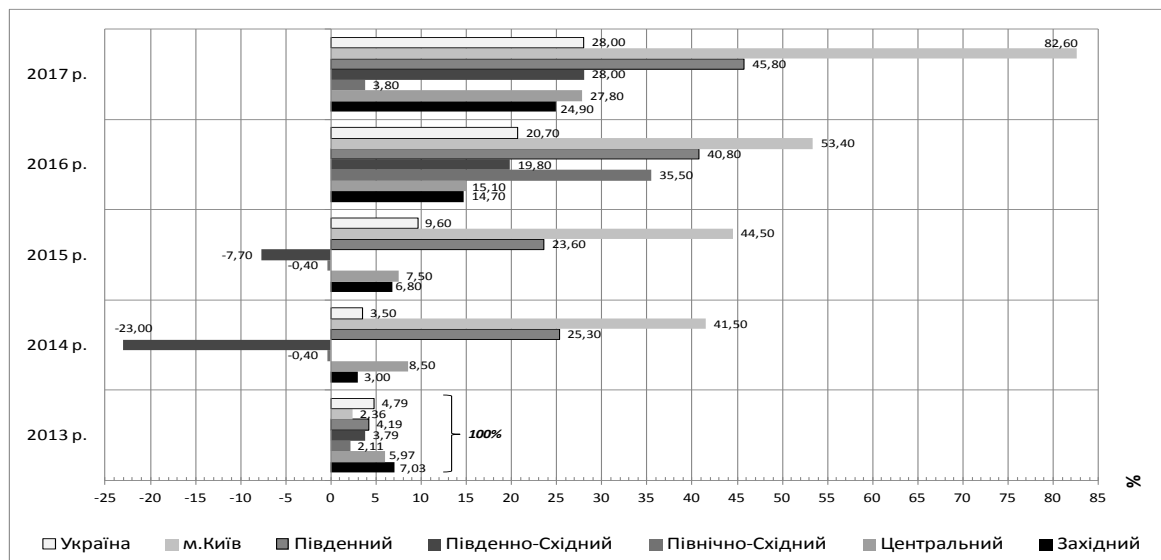
Regional dynamics of the incidence rates of children with acute cystitis (per 1000 corresponding us.); M ± m

Regions	0-14 years					M±m
	2013	2014	2015	2016	2017	
Western	4,58	4,41	4,29	4,21	4,21	4,34±0,05
Central	2,96	2,86	2,84	2,31	2,57	2,71±0,1
Northeast	1,14	1,08	1,03	1,01	1,05	1,06±0,2
South-East	1,20	1,10	1,11	1,37	1,57	1,27±0,08
South	1,45	1,39	1,39	1,47	1,53	1,45±0,02
Kyiv	0,53	0,56	0,58	0,59	0,67	0,59±0,02
Ukraine	2,26	2,22	2,20	2,16	2,23	2,21±0,01
Regions	15 - 17 years					M±m
	2013	2014	2015	2016	2017	
Western	7,03	7,37	7,51	8,06	8,78	7,75±0,3
Central	5,97	6,48	6,42	6,87	7,63	6,67±0,2
Northeast	2,11	2,10	2,10	2,86	2,19	2,27±0,1
South-East	3,79	2,92	3,50	4,54	4,85	3,92±0,3
South	4,19	5,25	5,18	5,90	6,11	5,33±0,3
Kyiv	2,36	3,34	3,41	3,62	4,31	3,41±0,3
Ukraine	4,79	4,96	5,25	5,78	6,13	5,38±0,2

In general, in Ukraine, the indicators among children under 14 years of age, with a slight tendency to decrease, do not differ significantly and are lower by 2.2 - 3.4 times the incidence rate among adolescents at their annual growth rate of 3.5% 9.6%, 20.7%, 28.0% by the coefficient of visibility (providing the value of 2013 for 100%). As it can be seen from Table. 4, the incidence at the age of 0 - 14 years was in the range of 2.16 - 2.26 per 1000 population and averaged 2.2±0.01, although from year to year it decreased by 1.8%, 2.6%, 4.4%, 1.3%, while adolescents in five years increased by 28% and were equal in 2017 to 6.13; and averaged 5.38 ± 0.2. According to the comparative analysis of the dynamics of indicators among children under 14 and 15-17 years in each region and the capital, as well as summarizing their in-

dicators in the form of averages, we can conclude that in both cases the distribution of rankings is almost the same. Thus, the first four of them belong to the Western, Central, Southern and South-Eastern regions; the average levels of morbidity of children under 14 years of age and adolescents, respectively, were in the following areas, respectively: 4.34± 0.05 and 7.75 ± 0.3; 2.71±0.1 and 6.67±0.2; 1.45±0.02 and 5.33±0.3; 1.27±0.08 and 3.92±0.3 (per 1 thousand inhabitants).

In addition, the incidence of adolescents must increase from year to year in all administrative territories, and more intensively in the Southern region and Kyiv, which can be seen in the coefficient of visibility (Fig. 1).



[Ukraine, Kyiv, Southern, South-Eastern, Northeast, Central, Western]

Fig. 1. Coefficient of visibility of the dynamics of the incidence in children aged 0 - 14 years for acute cystitis (per 1.000 people).

In contrast, among children under 14 there is a steady annual decrease in the level in the Western, Central, Northeastern regions, in the rest of the coun-

try (Southeast, Southern regions, the Capital), in recent years there has also been an increase in morbidity (Fig. 2).

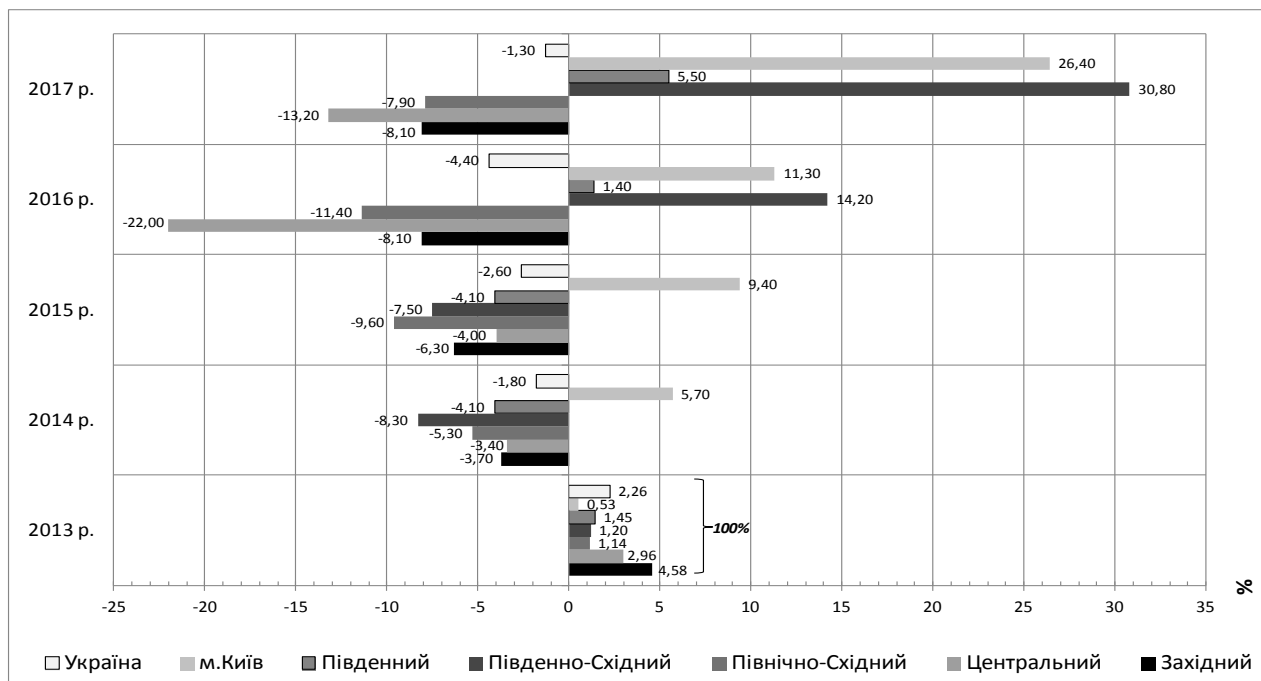


Fig. 2. Coefficient of visibility of the dynamic incidence of acute cystitis in children aged 15-17 years (per 1.000 people).

Discussion. According to the results of analytical-synthetic, comparative analysis of official statistics for 2013-2017 in Ukraine, it was found that adolescents are at risk due to the growth among them of acute cystitis by 28.0% to 6.13 in 2017, the value which was 2.2 - 3.4 times higher than among children under 14 years of age with a tendency to decrease and were in the range of 2.16 - 2.16 per 1,000 population, unfortunately, the specific information presented could not be compared with other authors. Most of them emphasize only the sufficient prevalence of pathology in the pediatric pop-

ulation and refer to the lack of its accuracy [15-17]. In a separate publication by VV Verbytsky and co-author, it is noted that 32% of young children with urinary tract infections have acute cystitis [15]. More often there are references to the frequency of hospitalizations with urinary tract infections, the group of which includes acute cystitis, and, according to Rafalsky et al it is the most common [18]. In particular, in the structure of hospitalized nephrology hospitals, 10.0% account for cystitis and 22.0% in the structure of microbial-inflammatory diseases of the urinary system. Under such conditions,

substantiated, objectively confirmed information on the identification of areas in which during all years their values significantly exceed the values of the average Ukrainian and, thus, actually need a variety of increased attention because they form the overall picture in the country. Such oblasts include: Volyn, Ivano-Frankivsk, Lviv, Rivne, Ternopil, Chernivtsi – all of them, except for Transcarpathia, are part of the Western region; Vinnytsia, Kyiv, - from the Central; Dnipropetrovsk, Kirovohrad, Kharkiv - South-East; Mykolayivska, Odesa – South. That is, 13 regions of Ukraine stand out among others, targeted measures that require assessment of the real situation to identify the root causes, and their broad vector covers not only medical aspects in clinical and organizational terms but also behavioral, social, etc.

The summary of the above data shows the urgency of providing specialized care to children with acute cystitis, and the identified regions and areas that are part of them and have not only high morbidity but also stand out for their growth, dictate the need for a thorough study of the root causes of the situation and development of purposeful clinical-organizational, administrative measures. At the same time, they need to take into account the age characteristics that were discovered during the study.

Conclusions. It was found that, with the relative stabilization of registered children with acute cystitis in Ukraine in 2013-2017, the vast majority of them are under the age of 14 and only one in three cases are adolescents, with, in contrast, among the latter is charac-

terized by annual growth in most areas (by 2.3% to 6619 against 0.3% to 14518). In the structure of the distribution of the total number of children with acute cystitis, regardless of age, the first three places belonged to the Western, Central, South-Eastern regions; they account for 94.3% and 93.0% of children under 14 years and adolescents with this pathology. Eight oblasts (Lviv, Ternopil, Chernivtsi, Vinnytsia, Kyiv, Dnipropetrovsk, Kharkiv, Odesa) were identified, where 11468 out of 21137 (54.2%) children with acute cystitis were concentrated in 2017. Levels of incidence of acute cystitis (per 1.000 corresponding population) of children under 14 years of age with a slight tendency to decrease ranged from 2.16 to 2.26 (average for 5 years was 2.2 ± 0.01) and were 2.2 - 3.4 times less than among adolescents, who grew annually (by 28.0% from 2013 to 2017 and amounted to 6.13; an average of 5.3 ± 0.2).

Conflicts of interest. The authors have no conflict of interest regarding the materials of this article.

Authors' contributions.

N. Saidakova: concept and design of the study, analysis of the obtained data.

O. Shulyak: concept and design of research, formation of conclusions.

A. Klyus: copying indicators, compiling summary tables, statistical data processing.

G. Kononova: design of the text of the work, search for sources of information on the topic.

V. Grodzinsky: work with primary documentation for 2013-2017, selection of statistical data.

References:

1. *Seimivsky DA, Petersburg VF, Kalischuk OA.* Inflammation of the kidneys and urinary tract in children: pathogenesis, diagnosis, treatment. *Modern pediatrics.* 2009;2:164-167. Available from: http://old.medexpert.org.ua/modules/myarticles/article_storyid_276.html [In Ukrainian].
2. *Ibrahim OR, Alao MA.* Pediatric chronic kidney disease: Manifestations and evaluation. *Ukr J Nephrol Dial.* 2021;1(69):54-60. doi: 10.31450/ukrjnd.1(69).2021.08.
3. *Fomina S.* Chronic kidney disease in children in Ukraine. *Ukr J Nephrol Dial.* 2021;1(69):16-26. doi: 10.31450/ukrjnd.1(69).2021.03
4. *Ivanov DD.* Urinary tract infections in children. 2011;2 (9):12 - 15. Available from: <https://d-1.com.ua/ua/archive/2011/2%289%29/pages-12-15/infekciyi-sechovoyi-sistemi-u-ditey> [In Ukrainian].
5. *Kotov SV, Perov RA.* Combined prevention of recurrent inflammatory diseases of the lower urinary tract in children and pregnant women. *Urology.* 2020; 2:122-126. doi: 10.18565/urology.2020.2.122-126 [In Russian].
6. *Szymanek-Szwed M, Jurkiewicz B, Samotyjek Jh, Zaleska-Oracka K.* Cystitis cystica – chronic urinary bladder inflammation in children. *Health Problems of Civilization.* 2021;1(15):61-67. doi: 10.5114/hpc.2021.103356.
7. *Kolesnyk M, Stepanova N, Korol L, Romanenko O, Mygal L.* Prediction of recurrent pyelonephritis by an index of oxidative stress. *Lik Sprava.* Sep-Oct 2014;(9-10):81-88. [In Ukrainian].
8. *Seimivsky DA.* Cystitis in children: pathogenesis, diagnosis, treatment. *Clinical immunology. Allergology. Infectology.* 2008;4:37-40. Available from: <https://kiai.com.ua/ua/archive/2008/4%2815%29/article-203/cistit-u-ditey-patogenez-diagnostika-likuvannya> [In Ukrainian].
9. *Kulchevenya EV, Neimark AI, Tsukanov A.Yu, Yarin GYu.* Modern approaches to the diagnosis of acute cystitis and assessment of the quality of its treatment. *Urology.* 2020;3:22-24. doi: 10.18565/urology.2020.3.22-25 [In Russian].
10. *Kulchevenya EV.* A new approach to understanding the pathogenesis and treatment of infectious and inflammatory diseases of the genitourinary system. *Urology.* 2020;5:99-105. doi: 10.18565/urology.2020.5.99-105 [In Russian].

11. *Stepanova N.* Hyperoxaluria; a risk factor or a consequence of recurrent pyelonephritis? *J Nephropathol.* 2021;10(4), e36. doi:10.34172/jnp.2021.36.
12. *Gaiseniuk FZ, Driianskaia VE, Drannik GN, Rudenko MIu, Lavrenchuk OV, Stepanova NM, et al.* Proinflammatory cytokines in patients with pyelonephritis. *Lik Sprava.* 2013 Sep;(6):32-37. [In Russian].
13. *Driyanska VE, Drannik GN, Stepanova NM, Lebed LO, Kruglikov VT, Driyanska VV, et al.* Positive effects of modern immunocorrection according to the analysis of cytokines and SLPI in patients with pyelonephritis. *Lik Sprava.* 2014 Dec;(12):45-56. [In Ukrainian].
14. *Korol LV, Mygal LY, Stepanova NM.* Intensity of oxidative stress and activity of angiotensin converting enzyme in blood of patients with uncomplicated pyelonephritis. *Ukr Biochem J.* 2017;89(2):99-105. doi: 10.15407/ubj89.02.099.
15. *Verbitsky VI, Chugunova OL, Yakovleva SV.* Features of the course, clinical picture, diagnosis and treatment of some diseases of the urinary system in young children. *Pediatrics.* 2002; 2:4-9. [In Russian].
16. *Vozianov AF, Maidanik VG, Vidny VG, Bagdasarova IV.* *Fundamentals of Pediatric Nephrology.* Kiev: Book plus, 2002. 347 p. [In Ukrainian].
17. *Mitrofanov KV.* Cystitis in children. Mother and child in Kuzbass. 2005:3- 9. Available from: <https://ur.booksc.eu/book/50850811/b62d1c> [In Russian].
18. *Rafalsky VV, Moiseeva EM.* Epidemiology of uncomplicated community-acquired urinary tract infections in the Russian Federation. *Urology Bulletin.* 2018; 6 (2)2:34-37. doi: 10.21886/2308-6424-2018-6-2-30-37 [In Russian].