DOI: https://doi.org/10.30841/2307-5090.4.2022.274447
УДК 616.61-002.3

The problem of pyelonephritis in terms of medical and social significance

N.O. Saidakova*, *S.P. Pasiechnicov, O.V. Shulyak, A.L. Klius, G.E. Kononova, Y.N. Melnichuk
SI «Academician O.F. Vozianov Institute of Urology to NAMS of Ukraine», Kyiv

Chronic pyelonephritis (CP) is known for the frequency of visits, hospitalizations, adverse effects. Over time, significant advances in diagnosis and treatment have made the study of medical and social issues relevant.
The objective: **the above determined the purpose of the study: to assess the features of epidemiological changes in chronic pyelonephritis among different segments of the adult population in the regions of Ukraine and to identify the dynamics of key performance indicators of specialized care for such patients.**
***Materials and methods*. The official sources of reporting for 2013 - 2020 in Ukraine as a whole in Ukraine and its administrative territories are analyzed, taking into account different segments of the population. The data are statistically processed according to the classical estimation of variation series and comparison of statistical values.**
***Results*. A typical sign is a decrease in registered and newly diagnosed patients with CP. Dominated by people of working age and urban population. Areas where the corresponding indicators are below average, average and above them have been identified. Against the background of a widespread decrease in hospitalizations (by 21.3% in Ukraine) its duration (by 12.7%), mortality doubled to 3.49%. It was confirmed that CP is the second leading cause of chronic kidney disease stage III and IV (21.2% and 20.8% in 2020), with stage V – third (14.04%), in the regions the percentage reached 50–85% at III, 30–48% – IV and 20–33% – V stages. There was a positive decrease (from 27.5% to 20.0%) in cases of primary disability due to pathology.**
***Conclusions*. The peculiarities of the prevalence, incidence of CP in the regions and oblasts of Ukraine among all segments of the population, the nature of changes in the main indicators of inpatient treatment and the dynamics of the effectiveness of specialized care were displayed.**
Areas have been identified that require the attention of health authorities, specialists (nephrologists, urologists) in order to develop effective clinical and organizational measures based on an in-depth study of the causes of the situation.
Keywords: *chronic pyelonephritis, adult population, regions, prevalence, morbidity, hospitalization, mortality, disability.*

Проблема пієлонефриту з точки зору медико-соціального значення

Н.О. Сайдакова*, *С.П. Пасєчніков, О.В. Шуляк, А.Л. Клюс, Г.Є. Кононова, Я.М. Мельничук

Хронічний пієлонефрит (ХП) відомий за частотою звернень, госпіталізацій, несприятливими наслідками. Суттєві досягнення в діагностиці та лікуванні актуалізували вивчення медичних та соціальних питань.
Мета дослідження: оцінювання особливостей епідеміологічних змін хронічного пієлонефриту серед різних верств дорослого населення в регіонах України та виявлення динаміки основних показників результативності надання спеціалізованої допомоги таким хворим.
Матеріали та методи. Проаналізовано офіційні джерела звітності за 2013–2020 рр. загалом по Україні та її адміністративним територіям з урахуванням різних верств населення. Дані статистично опрацьовані за класичною оцінкою варіаційних рядів та порівнянням статистичних величин.
Результати. Простежена типова ознака – зменшення зареєстрованих та вперше виявлених хворих на ХП. Серед хворих на ХП переважали особи працездатного віку та міське населення. Проаналізовані області, де відповідні показники нижче середніх, середні та вищі за них. На тлі зменшення госпіталізацій (на 21,3% в Україні) та її тривалості (на 12,7%) удвічі зросла летальність (до 3,49%). Підтверджено, що ХП посідає друге місце серед причин розвитку хронічної хвороби нирок III та IV стадій (21,2% та 20,8% відповідно у 2020 р.), третє місце – при V стадії (14,04%), по областях відсоток досягав 50–85% при III стадії, 30–48% – при IV стадії, 20–33% – при V стадії. Позитивним було зменшення (з 27,5% до 20,0%) випадків первинної інвалідності внаслідок патології.
Висновки. Виявлені особливості поширеності, захворюваності ХП в регіонах та областях України серед усіх верств населення, характеру змін основних показників стаціонарного лікування та динаміки результативності спеціалізованої допомоги.
Виявлено території, що потребують за величиною відповідних показників прицільної уваги органів охорони здоров'я, фахівців (нефрологів, урологів) з метою розроблення дієвих клініко-організаційних заходів на підставі поглибленого вивчення причин ситуації.
Ключові слова: *хронічний пієлонефрит, доросле населення, регіони, поширеність, захворюваність, госпіталізація, летальність, інвалідність.*

It is generally accepted and proven by many authors that pyelonephritis is one of the most common diagnoses in nephrology and urology [1, 2]. According to modern estimates, the share of acute and chronic types of its course is 60-70% of the total flow of appeals to specialists in this field [3, 4]. It should be noted that in reality it is difficult to obtain absolute information about the incidence and prevalence of the pathology, as not all patients consider it

necessary to seek help with asymptomatic manifestations. In addition, there is a fact that in most (over 80% of cases) pyelonephritis can complicate any infectious and most somatic diseases and is registered as a concomitant diagnosis [5, 6]. It is also worth noting the complex existing problem of lifelong diagnosis associated with pathomorphosis, when there are changes in the typical clinic due to the 10-year course of the disease.

Today, the symptoms of the acute period are often nonspecific. According to statistics from postmortem studies, 8-10% of autopsies and twice as often among the elderly died of pyelonephritis were not diagnosed in life [7, 8]. A number of authors acknowledge that up to 80% of cases of pyelonephritis remain unrecognized, and the rate of misdiagnosis reaches 30-50%. This trend is global [9, 10]. The average epidemiological estimates published in the literature show that about 1% of the world's population suffers from pyelonephritis each year, amounting to about 72 million people.

In the total number of taken into account urogenital infections more than half (53%) are chronic pyelonephritis, 13–14% – acute [11, 12]. Despite the fact that at present practical medicine has sufficient experience and a wide arsenal of modern methods of diagnosis, treatment regimens, the problem of specialized care for such patients is not less. Among the main reasons are untimely treatment, widespread self-medication, the frequency of antibiotic resistance. Increasing inflammation in the kidney with the development of intoxication, and over time - the activation of the process leads to loss of organ function.

That is, a chronic kidney disease develops that requires replacement therapy and is one of the leading causes of disability and mortality [13, 14, 15]. This reveals the essence of the problem, emphasizes its medical and social significance. Under such conditions, the first place in the health care system traditionally belongs to the prevention of relapses while maintaining the key provisions of timely diagnosis and adequate treatment.

Emphasizing the active monitoring, it is necessary to recognize the obvious need to be aware of the prevalence of chronic pyelonephritis in the country, and in the regional aspect, as there is now the opportunity to make local decisions through decentralization, taking into account the specific situation in each.

The objective: the above determined the purpose of the study: to assess the features of epidemiological changes in chronic pyelonephritis among different segments of the adult population in the regions of Ukraine and to identify the dynamics of key performance indicators of specialized care for such patients.

MATERIALS AND METHODS

The data of state and branch statistics are used in the work: «Report on the network and activity of medical institutions» (F. №47), «Report on the number of diseases registered in patients living in the service area of the medical institution» (F. №17), «Report of the treatment and prevention institution» (F. №20). The study period with comparative, analytical-synthetic analysis was 2013–2017 and 2020.

The limitation of data on disability due to diseases of the genitourinary system has led to the involvement of two sources of information. One of them was the information of the reporting forms №14 «Report on the causes of disability, indications for medical, professional and social rehabilitation», approved by the Order of the Ministry of Health of Ukraine on July 10, 2007 №378. Of the eight sections, in accordance with the research task, section 4 «Distribution of first-time disabled people by disease classes and individual nosological forms» and chapter 5 «With the total number of first-time disabled people» were considered. The second - were the statistical collections of the State Institution «Ukrainian State Research Institute of Medical and Social Problems of Disability of the Ministry of Health of Ukraine» for 2016, 2020 [16, 17, 18]. In addition, the data of the National Register of Patients with Chronic Kidney Disease and Patients with Acute Kidney Damage for 2020 were used [19, 20, 21].

Absolute, relative values and intensive coefficients were analyzed in the work. Variation series were processed using generally accepted methods (absolute increase / decrease; increase / decrease rate). In cases of distribution of regions by levels of morbidity, prevalence of chronic pyelonephritis among the adult population, a known criterion of difference of ±13.0% relative to the average values in Ukraine as a whole was also used [22, 23, 24].

For generalization and in order to compare the data, the average values and their errors were calculated. When it was necessary to determine the reliability of the difference between two statistical populations, the classical Student's t test was calculated.

RESULTS AND THEIR DISCUSSIO

According to the comparative analysis, it was found that during the study period (2013–2017) in Ukraine there was a 3.4% less patients who were registered for chronic pyelonephritis. In 2017, there were 546,704 people, which was about 1.5% of the adult population.

The vast majority of them were of working age (52.6±0.06% against 47.4±0.06% older than them) and urban residents – 77.8%. The regional distribution of patients taking into account the age category, place of residence, features of their dynamics can be traced according to Table 1.

As can be seen from table 1, the largest number of patients with chronic pyelonephritis (CP) is registered in the South-Eastern region (35.8%), followed by the Western and Central regions with almost the same percentage (16.7% and 16.9%, respectively); together they accounted for 69–88%. The next two places belonged to the South (13.6%) and the North-East (11.8%), the latter to the city of Kyiv (5.1%). The structure of the regional distribution was similar for five years in a row. In addition, the positive dynamics of almost universal reduction of patients with higher intensity in the South-Eastern region and the city of Kyiv (by 8.2% and 3.5%, respectively) was general.

The age-specific feature of the distribution of patients by administrative territories over the years remains. Among the able-bodied population, the leading places belonged to the South-Eastern, Western, and the third divided the South from the Central regions; among the elderly, the South-East was followed by the Central and the South. The peculiarity was that among the former

Table 1

Number of registered patients with chronic pyelonephritis in the regional aspect, taking into account age, place of residence (2017)

Regions	Population 18 years and older			Workable			Older able-bodied			Urban		
	n	%	T p/z*	n	%	T p/z*	n	%	T p/z*	n	%	T p/z*
Western	91591	16,7	-1,3	61778	21,4	-10,3	29803	11,5	+2,8	35308	8,3	-35,3
Central	92735	16,9	-0,8	38052	13,2	-12,6	54683	21,1	+25,3	55344	13,0	-5,0
Northeast	64436	11,8	-1,1	33047	11,5	-6,5	31389	12,1	+11,7	48290	11,6	-0,1
Southeast	195928	35,8	-8,2	103358	36,0	-6,2	92570	35,7	+6,8	226747	53,3	-0,4
South	77309	13,6	-	38435	13,3	-7,2	35874	13,8	-1,2	30368	7,1	-53,4
Kyiv	27705	5,1	-3,5	12675	4,4	+1,1	15030	5,8	-7,1	29139	6,8	-3,7
Ukraine	546704	100,0	-3,4	287345	100,0	-12,8	259359	100,0	+8,1	425196	100,0	-12,0

Note: * – T p/z – growth / decrease rate compared to 2013.

there was a decrease in patients with the highest rate in the Central (by 12.6%) and Western (by 10.3%), and among the latter - their increase (by 8.1%), and with a greater pace in the Central region (by 25.3%).

As a result, in 2017, a total of 287,345 patients with CP were registered in Ukraine of working age, which is 12.8% less than five years ago, and 259,359 in retirement age with an increase of 8.1%. With a predominance among all registered urban patients with CP, their percentage decreased (84.8% in 2013, 77.8% in 2017), as well as the number (42 5196 vs. 48 2643 in 2013), the rate of decline was 12.0%. At the same time, the number of patients living in rural areas has increased. In 2017, this was one in five, with a total of 121,508 against 116,740 (by 4.0%). More than half of them are in the South-Eastern and Western regions.

In Ukraine, an average of 46,600±1,886.5 cases with a newly diagnosed CP are detected annually among the adult population (43,178 patients in 2017). Among them, people of working age always prevailed – 27,895, which is 64.6% of the total, as well as urban residents – 34,757 (80.5%). In fact, this category affects the nature of change in the country as a whole.

Their positive dynamics was manifested by a decrease in patients by 13.7%, able-bodied – by 15.7%, incapacitated – by 14.3%, urban – by 13.6%, rural – by 21.2%. The higher value of these indicators compared to similar in prevalence, indicates the accumulation of patients with CP who need treatment and active supervision. Regional features can be traced according to Table 2.

According to the analysis of table 2 we can draw the following conclusions. First, a decrease in newly detected cases was observed in four regions (Western, Central, Northeastern, Southeastern), an increase – in the South and Kyiv. In the structure of the distribution, the first three places were occupied by the South-East (39.0%), the West (17.3%), the third by the Central and the South (15.6% and 15.2%, respectively). These regions coincide with those where the largest number of patients are registered.

In each region there are areas in which both registered and newly diagnosed patients with CP are most concentrated. As for the former, in the Western region, out of 7 oblasts, 36.0% were in Lviv and Rivne oblasts; in the Central of 5 oblasts – 44.4% in Vinnytsia and Cherkasy; in the North-East from 3 – 42.0% in Poltava; in the South-East from 6 to 73.0% in Dnipropetrovsk and Kharkiv; in the South from 3 – 51.3% to Odessa and the capital should be singled out (27705 cases). Among the first patients in the Western region (41.2%) are Lviv and Ternopil; in the Central (42.1%) Kyiv and Khmelnytsky; in the North-East (44.4%) Poltava; in the South-East

Table 2

Dynamics of newly diagnosed patients with chronic pyelonephritis among the adult population of Ukraine in the regional aspect

Regions	Adult population				T p/z	Including									T p/z
						Workable				T p/z	Urban				
	2013		2017			2013		2017			2013		2017		
	n	%	n	%		n	%	n	%		n	%	n	%	
Western	9426	18,8	7461	17,3	-20,8	6544	19,7	5436	19,5	-17,0	4925	12,2	4103	11,8	-16,7
Central	7530	15,0	6740	15,6	-10,5	4890	14,7	4156	14,9	-15,0	4642	11,5	3731	10,7	-19,6
Northeast	4198	8,4	3289	7,6	-21,6	2701	8,2	2120	7,6	-21,5	3097	7,7	2544	7,3	-17,8
Southeast	21878	43,7	16834	39,0	-23,0	13864	42,0	10764	38,6	-22,4	20244	50,3	16498	47,5	-18,5
South	4804	9,6	6546	15,2	+36,3	4005	12,0	4245	15,2	+6,0	4996	12,4	5471	15,7	+9,5
Kyiv	2189	4,4	2307	5,3	+5,4	1084	3,3	1174	4,2	+8,3	2326	5,8	2410	7,0	+3,6
Ukraine	50925	100,0	43178	100,0	-13,7	33088	100,0	27895	100,0	-15,7	40230	100,0	34757	100,0	-13,6

HEALTH OF MAN / ЗДОРОВ'Я ЧОЛОВІКА • №4 (83)/2022
ISSN 2307-5090 (Print) | ISSN 2412-5547 (Online)

Table 3

Dynamics of levels of prevalence of chronic pyelonephritis among different segments of the population (per 100 thousand of the population); 2017

Regions	Population 18 years and older		Working population		Urban population		Rural population	
	Total	T p/z*	Total	T p/z*	Total	T p/z*	Total	T p/z*
Western	1336,6	-1,0	1241,0	-0,1	1085,6	-7,1	1029,7	+0,5
Central	1645,7	+6,0	1175,0	-0,1	1428,8	-3,4	1396,5	+5,0
Northeast	2163,3	+5,0	1637,2	-1,4	2104,4	+2,0	1528,6	+5,0
Southeast	1695,3	+3,4	1226,2	-4,0	1543,7	-2,2	1251,8	+3,5
South	2014,5	+2,8	1496,3	+3,7	1956,4	+0,1	1184,2	+3,7
Kyiv	1174,4	-4,5	745,8	+3,8	1010,2	-6,4	-	-
Ukraine	1571,0	-6,6	1186,4	-7,7	1454,0	-10,4	1198,0	+1,8

Note: * – T p/z – growth / decrease rate compared to 2013.

(78.0%) Dnipropetrovsk and Kharkiv; in the capital – 2307 people. Of the 56.7% of registered and 53% of newly diagnosed patients, 8 oblasts and the city of Kyiv were.

According to the further analysis of indicators per 100 thousand of the corresponding population (further on the text we give for convenience only concrete values) the received data are similar on character of changes of absolute sizes.

In the table 3 the levels of prevalence of CP among different segments of the population in the regional aspect are presented.

As can be seen from table 3, the indicators became less than 5 years among the adult population by 6.6% to 1571.0 in 2017 due to urban residents (by 10.4% to 1454.0) and people of working age (by 7.7% to 1186.4 in 2017). The North-East, South and South-East regions are distinguished by the size of indicators among all contingents. Among people older than working age, the levels are much higher - in 2017 they reached 2386.9 and tended to increase over a larger area.

Data on the prevalence of CP in some areas are important for health authorities (Table 4).

The Table 4 shows that equally in each of the 8 oblasts the indicators were higher than average, medium and lower than them, the latter included Kyiv. The presence of significant fluctuations in values, even within the presented distribution of regions (2, 1.1 and 2.4 times, respectively) indicates a wide range of problematic issues in the system of specialized care for patients with CP and its organization.

This is especially relevant as a result of a similar distribution of regions according to the level of prevalence of the disease among the working age population (Table 5).

The results of the comparison of table 4 and 5 show that the average prevalence of CP among able-bodied people was lower in five oblasts and the city of Kyiv, and they are exactly the same as those among the population aged 18 and over. Such cooperation was observed in 5 out of 10 oblasts with an average level, which included Zakarpattia, Ivano-Frankivsk, Kirovohrad, Cherkasy, Kharkiv, as well as in 4 of 9 oblasts with an above-average level, which were joined by Rivne, Ternopil, Khmelnytsky, Chernihiv, Chernivtsi.

Data from the analysis of absolute and relative values of the incidence of CP also confirm the similarity of their dynamics. Levels of morbidity in the regional aspect in terms of different categories of the population are presented in Table 6.

According to table 6 there is a clear trend of declining morbidity among all segments of the population. Thus, in 2017 the indicator among the adult population was 124.1, which is 10.0% less than in 2013, among urban by 10.5% (up to 118.9) and rural by 11.8% (up to 99. 1), of working age – by 9% (up to 115.2), older than working age – by 12.7% (up to 146.4).

Table 4

Distribution of administrative territories of Ukraine according to the prevalence of chronic pyelonephritis among the adult population (per 100 thousand adult population); 2017

Below average	Per 100 thousand	Average	Per 100 thousand	Above average	Per 100 thousand
Oblasts		Oblasts		Oblasts	
Volyn	875,0	Vinnytsia	1625,6	Dnipropetrovsk	3748,8
Transcarpathian	1306,7	Zhytomyr	1776,9	Odesa	1990,8
Zaporizhzhia	624,9	Donetsk	1734,7	Poltava	2284,3
Ivano-Frankivsk	1209,5	Mykolayiv	1723,0	Rivne	1871,9
Kyiv oblasts	1115,7	Ternopil	1565,2	Kharkiv	1937,9
Kirovohrad	1352,0	Khmelnytsky	1740,3	Kherson	2329,7
Luhansk	773,7	Chernivtsi	1722,0	Cherkasy	1970,0
Lviv	806,0	Sumy	1744,0	Chernihiv	2460,7
Kyiv city	1174,4				
Ukraine	1571,0				

Table 5

Distribution of administrative territories of Ukraine by prevalence of chronic pyelonephritis among the working population (per 100 thousand adult population); 2017

Below average	Per 100 thousand	Average	Per 100 thousand	Above average	Per 100 thousand
Oblasts		Oblasts		Oblasts	
Volyn	803,9	Transcarpathian	1226,5	Rivne	1629,6
Lviv	675,0	Ivano-Frankivsk	1087,9	Ternopil	1461,9
Kyiv oblasts	869,3	Vinnytsia	1127,7	Poltava	1835,7
Zaporizhzhia	422,3	Zhytomyr	1247,8	Dnipropetrovsk	2769,2
Luhansk	596,8	Cherkasy	1299,8	Chernivtsi	1802,4
Kyiv city	745,8	Sumy	1232,2	Khmelnytsky	1330,4
		Donetsk	1182,6	Chernihiv	1843,8
		Kirovohrad	1163,4	Odesa	1419,9
		Kharkiv	1222,7	Kherson	1830,4
		Mykolayiv	1238,6		
Ukraine	1186,4				

Table 6

Dynamics of incidence rates of chronic pyelonephritis among the adult population of Ukraine, taking into account age, place of residence (per 100 thousand of the relevant population); 2017

Regions	Population 18 years and older		Working population		Urban population		Rural population	
	Total	T p/z*	Total	T p/z*	Total	T p/z*	Total	T p/z*
Western	101,8	-11,2	104,1	-16,3	115,5	+5,8	93,0	-15,5
Central	113,0	-12,2	105,0	-12,3	100,8	-14,4	113,2	-5,4
Northeast	109,0	-19,4	96,6	-22,8	112,1	-14,8	81,0	-25,2
Southeast	141,3	-6,0	131,1	-7,1	120,0	-8,1	101,0	-16,0
South	191,5	+11,8	175,1	+18,3	192,6	+18,3	98,4	-14,6
Kyiv	90,4	-1,5	69,1	+11,3	83,6	+0,7	-	-
Ukraine	124,1	-10,0	115,2	-9,0	118,9	-10,5	99,1	-11,8

Note: * – T p/z – growth / decrease rate compared to 2013.

Table 7

Distribution of administrative territories of Ukraine by incidence of chronic pyelonephritis among the adult population (2017)

Below average	Per 100 thousand	Average	Per 100 thousand	Above average	Per 100 thousand
Oblasts		Oblasts		Oblasts	
Vinnytsia	103,4	Donetsk	132,7	Dnipropetrovsk	219,0
Volyn	76,1	Zhytomyr	126,1	Mykolayiv	241,1
Transcarpathian	108,5	Poltava	123,4	Odesa	143,9
Zaporizhzhia	39,3	Cherkasy	123,3	Kharkiv	147,5
Ivano-Frankivsk	98,0	Sumy	112,9	Kherson	189,6
Kirovohrad	115,9	Ternopil	131,7		
Kyiv oblasts	102,7				
Lviv	95,8				
Luhansk	43,6				
Rivne	120,8				
Khmelnytsky	109,1				
Chernivtsi	81,9				
Chernihiv	90,4				
Kyiv city	90,4				
Ukraine	124,1				

Table 8

Dynamics of treated patients with chronic pyelonephritis in inpatient conditions in the regional aspect

Regions	2013		2017		T p/z	2020		T p/z*
	n	%	n	%		n	%	
Western	9844	24,7	8020	25,6	-18,5	3640	22,6	-54,6
Central	8162	20,5	7090	22,7	-13,1	3400	21,1	-52,0
Northeast	3986	10,0	3327	10,6	-16,5	1855	11,5	-44,2
Southeast	13336	33,5	9527	30,4	-28,6	5267	32,7	-44,7
South	3533	8,9	2712	8,7	-23,2	1621	10,0	-40,2
Kyiv	897	2,3	624	2,0	-30,0	315	2,0	-49,5
Ukraine	39758	100,0	31300	100,0	-21,3	16098	100,0	-48,6

Note: * – T p/z – growth rate (decrease) until 2017.

Indicators among the urban population in the vast majority of oblasts are higher than among rural residents, and among those older than working age than able-bodied. Among others, the Southern and South-Eastern regions stand out. This echoes the data on the distribution of areas. Above average indicators are found in 5 areas (Dnipropetrovsk, Kharkiv, Nikolaev, Odesa, Kherson) which are a part of them (Table 7).

Oblasts with higher than average levels of morbidity and prevalence coincide (see Table 4), which warns and justifies the need for more detailed study of the situation based on expert assessment of the quality of diagnosis and treatment of patients with CP with subsequent adoption of clinical and organizational management measures. However, in most oblasts (13), Kyiv, the indicators are below average, and in 5 – close to average.

Thus, in Ukraine for 2013–2017, the number of registered and newly detected cases of CP decreased in almost all segments of the adult population, the vast majority of them were of working age and urban residents. The regional structure of their distribution is revealed and the peculiarities in the dynamics are traced, as well as the areas that stand out among others and that actually shape the situation are identified.

According to the indicators calculated per 100 thousand of the relevant population, the data obtained, which are consistent with the above in nature. The incidence and prevalence of pathology are higher among people of retirement age and urban population.

Since the analysis of the incidence and prevalence of CP among different segments of the population of Ukraine used official statistics, and special epidemiological studies could not be found, we note only that in all publications on various aspects of pathology, the authors note the relevance of issues, referring to prevalence comparing it with that of acute respiratory diseases [25, 26, 27].

Of interest in the aspect of discussion of the work, in some way, is the number of treated patients in an inpatient setting, as well as some indicators of the effectiveness of specialized care. According to statistics, the general tendency to reduce the number of hospitalized is the opposite; specific information for its characteristics are given in Table 8.

According to the analysis, the table 8 clearly shows the intensity of the process over the years. Thus, in 2020, 1,698 people received inpatient care, which is 2.5 and 2.0 times less than in 2013 and 2017, respectively. Their share among all registered patients also decreased (from 7.0% to 5.7%). The identified situation in general deserves a positive assessment, if we assume the actualization of medical care in outpatient settings.

However, the reduction in the number of treated patients in 2020 may also be partly due to a reduction in bed stock, and due to coronavirus (Covid-19). During the years of follow-up, the South-Eastern, Western and Central regions ranked first three months in the percentage of inpatients. Simultaneously with the decrease in the number of patients who received specialized treatment in the hospital, its duration decreases (Table 9).

This feature, which is specific to each region and more pronounced with each year of study, should be considered positive and logically justified given the achievements in the diagnosis and treatment of pathology due to the development of the pharmaceutical industry and the associated emergence of new, improved treatment regimens.

Apparently, the spread of family medicine is important when the next supervision under the supervision of family physicians is provided in compliance with the provided recommendations and the possibility of adjusting the tactics of such patients in consultation with nephrologists (urologists). And most importantly – they prevent recurrences, complications.

At the same time, the fact of a significant increase in mortality is alarming (Table 10).

As can be seen from Table 10, in 2017 the mortality rates are higher than in 2013 in all regions; in Ukraine as a whole, they were 1.73% versus 1.54%, respectively. In 2020, the mortality rate reached 3.19% and was 2 times higher than in 2013 and 1.8 times higher in 2017.

Table 9

Dynamics of the average bed / day of inpatient treatment for chronic pyelonephritis in the regional aspect; M ± m

Regions	2013	2017	2020
	1	2	3
Western	11,35±1,0	10,49±0,55	9,59±0,5Δ*
Central	10,16±0,8	9,89±0,76	8,69±0,3*
Northeast	11,57±0,8	11,11±0,72	10,5±0,9
Southeast	11,33±0,9	11,05±0,69	10,23±0,71
South	11,72±0,6	10,8±0,58	9,75±0,71Δ
Kyiv	10,90	10,34	10,88
Ukraine	11,32	10,76	9,88

Note: * – the difference is significant P 1-3; 2-3 (p<0.05); Δ / P 1-3.

Table 10

Dynamics of mortality from chronic pyelonephritis in the regional aspect; M±m

Regions	2013	2017	2020
	1	2	3
Western	0,66±0,2	0,66±0,3	4,27±1,8*
Central	0,93±0,7	1,27±0,8	2,72±0,9
Northeast	1,22±0,8	1,37±0,7	1,74±0,9
Southeast	1,96±0,7	1,78±0,5	3,62±1,1*
South	2,05±0,9	3,31±1,1	4,68±2,3
Kyiv	5,88	8,50	16,22
Ukraine	1,54	1,73	3,19

Note: * – reliable values of P 2-3 (p <0,05).

Significant changes have been observed in recent years, the difference has reached significant changes in the West (from 0.66±0.3% in 2017 to 4.27±1.8% in 2020) and the North-East (from 1.28±0.5% to 3.6±1.1%, respectively).

The importance of the problem of providing medical care to patients with CP is growing due to its negative impact on public health and quality of life. It manifests itself as a reason for disability due to the development of chronic kidney disease (CKD), especially stages IV, V, when special methods of replacement therapy, organ transplantation are required. It should be noted that in the whole country in 2020 among the causes of CKD III, IV stages of pathology is second only to nephropathy, their percentage was respectively 21.20%, 20.18% vs. 38.62% and 34.92%), in stage V – third: 14.04% against chronic glomerulonephritis (36.70%) and diabetic nephropathy (18.75%).

Mykolayiv, Odesa, Zhytomyr, Kherson, Luhansk, and Dnipropetrovsk oblasts stand out among the oblasts with high rates of this reason, with values reaching 50-85% in stage III, 30–48.1% in stage IV, and 20–33.2% in stage V.

According to official data, chronic glomerulonephritis and chronic pyelonephritis are distinguished in the structure of the causes of primary disability of the adult population according to certain nosological forms of the genitourinary system (Table 11).

According to the analysis of table. 11 shows that over the years the number of people recognized as disabled for the first time decreases from 1795 in 2016 to 1549 in 2020 (by 13.7%), with significant fluctuations in the area. Over 5 years, the proportion of chronic glomerulonephritis significantly increased (from 33.5±1.5% to 43.8±1.9%)

Table 11

Primary disability of the adult population by certain forms of diseases in terms of regions of Ukraine

Regions	2016						2020					
	abs. number	10 thousand population	including glomerulo-nephritis		including pyelonephritis		abs. number	10 thousand population	including glomerulo-nephritis		including pyelonephritis	
			n	10 thousand	n	10 thousand			n	10 thousand	n	10 thousand
Vinnytsia	80	0,6	29	0,2	17	0,1	71	0,6	30	0,2	8	0,1
Volyn	38	0,5	8	0,1	2	0,02	43	0,5	18	0,2	3	0,04
Dnipropetrovsk	158	0,6	52	0,2	74	0,3	124	0,5	48	0,2	47	0,2
Donetsk	80	0,5	28	0,2	20	0,1	68	0,4	38	0,2	12	0,1
Zhytomyr	47	0,5	26	0,3	13	0,1	43	0,4	17	0,2	7	0,1
Transcarpathian	56	0,6	9	0,1	7	0,1	28	0,3	15	0,2	2	0,02
Zaporizhzhia	68	0,5	30	0,2	9	0,1	71	0,5	31	0,2	7	0,1
Ivano-Frankivsk	73	0,7	32	0,3	15	0,1	75	0,7	24	0,2	18	0,2
Kyiv oblasts	72	0,5	26	0,2	13	0,1	78	0,5	13	0,1	17	0,1
Kirovograd	46	0,6	7	0,1	7	0,1	37	0,5	9	0,1	5	0,1
Luhansk	30	0,5	2	0,03	2	0,03	19	0,3	2	0,03	-	-
Lviv	201	1,0	75	0,4	82	0,4	224	1,1	135	0,7	43	0,2
Mykolayiv	40	0,4	14	0,1	8	0,1	29	0,3	16	0,2	5	0,1
Odesa	101	0,5	33	0,2	28	0,1	110	0,6	56	0,3	27	0,1
Poltava	53	0,4	21	0,2	16	0,1	50	0,4	21	0,2	11	0,1
Rivne	46	0,5	18	0,2	5	0,1	46	0,5	12	0,1	6	0,1
Sumy	52	0,6	24	0,3	10	0,1	38	0,4	13	0,1	6	0,1
Ternopil	48	0,5	16	0,2	14	0,2	36	0,4	20	0,2	9	0,1
Kharkiv	120	0,5	58	0,3	36	0,2	66	0,3	32	0,1	11	0,05
Kherson	43	0,5	18	0,2	15	0,2	22	0,3	18	0,2	3	0,04
Khmelnytsky	64	0,6	17	0,2	10	0,1	52	0,5	21	0,2	8	0,1
Cherkasy	67	0,6	23	0,2	25	0,2	57	0,6	23	0,2	9	0,1
Chernivtsi	43	0,6	1	0,01	30	0,4	27	0,4	3	0,04	15	0,2
Chernihiv	45	0,5	18	0,2	11	0,1	27	0,3	15	0,2	3	0,04
Kyiv city	124	0,5	17	0,1	25	0,1	108	0,5	49	0,2	26	0,1
Ukraine	1795	0,6	602	0,2	494	0,2	1549	0,5	679	0,2	309	0,1

and became significantly lower in chronic pyelonephritis (from 27.5±2.0% to 20.0±2.2%).

That is, in the latter case, the changes were positive in the administrative territories. Exceptions were 5 oblasts (Volyn, Zaporizhia, Ivano-Frankivsk, Kyiv, Rivne), where there was an increase in cases of CP as a cause of primary disability; the increase in them was in the range of 20–50%. It should be noted that 46.3% in 2020 among cases of disability due to CP (309) – accounted for Dnipropetrovsk, Lviv, Mykolaiv oblasts nd Kyiv. Per 10,000 population, the figure decreased in the country from 0.2 in 2016 to 0.1 in 2020, it increased in Volyn and Ivano-Frankivsk oblasts.

Thus, the study identified the prevalence, incidence of CP among different segments of the adult population of Ukraine and their differences in the regions and oblasts that make them up. The nature of changes in the main indicators of the effectiveness of specialized care for such patients is traced. Regions that need the attention of health authorities have been identified due to the greater concentration of patients in reducing their inpatient treatment with longer duration, mortality, development of CPP and primary disability (Southeast, South and West).

CONCLUSIONS

A typical for all regions decrease was stated in registered patients with chronic pyelonephritis (CP) for 5 years in Ukraine by 3.4% to 546704 in 2017, which amounted to about 1.5% of the adult population. A significant majority of them were of working age (52.6 ± 0.06% against 47.4±0.06% older than them) and urban residents (77.8%); which decreased by 12.8% and 12.0%, respectively, while in the retirement period and among rural residents increased by 8.1% and 4.0%, respectively. In the distribution structure, 69.4% fell on the South-Eastern, Western and Central regions.

It is established that on average in Ukraine there are 46,600 ± 1886 cases with the first diagnosis of CP (43178 in 2017, which is 13.7% less than in 2013), among them 64.6% and 80.5 % were of working age and urban residents, respectively; for 5 years the rate of decline of the former – 15.7%, the latter – 13.6%, people older than working age – 14.2%, rural residents –21.2%. Of the total number of patients, 72.0% are concentrated in the South-Eastern, Western and Central regions.

The levels of prevalence and morbidity (per 100 thousand population) have decreased since 2013 among the adult population of Ukraine by 6.6% and 10.0% to 1571.0 and 124.1 in 2017, respectively. In the first case, the trend was among the able-bodied and older (by 7.7% and 8.1% to 1186 and 2386.9, respectively), urban residents (by 10.4 to 1454.0)), with the exception of growth by 1.8% among rural residents (up to 1198.0). Morbidity rates decreased among all segments of the population by 9.0% and 12.7%, respectively (to 115.2 and 146.4; by 10.5% and 11.8% to 118.9 and 99.1).

The distribution of oblasts by prevalence with lower than average, medium and higher than average levels revealed that the latter include 8 (Dnipropetrovsk, Odesa, Poltava, Rivne, Kharkiv, Kherson, Cherkasy, Chernihiv); by morbidity – 5 (Dnipropetrovsk, Kharkiv, Mykolaiv, Odesa, Kherson).

There was a decrease in hospitalized for CP, for 5 years by 21.3% to 31,300 cases in 2017. Further, the process was more intensive and amounted to 48.6% in 2020 compared to 2017 (16098), most of them accounted for the South-Eastern, Western, Central regions, in the latter two the decline exceeded 50%. At the same time, the bed-day became smaller: the national average was 11.32; 10.76 and 9.88 in 2013, 2017 and 2020, respectively. In the South and West it was the longest, which differed significantly. However, the mortality rate increased 2 and 1.8 times in 2020 compared to 2013 and 2027. and was 3.49% versus 1.84% and 1.73%, in the West, South and South-East was higher than in other regions.

It is confirmed that CP is the second leading cause of CKD stage III and IV in 2020 – 21.2%, 20.8% vs. 38.62% and 34.92% in 2016, with stage V – third (14.04%). Mykolaiv, Odesa, Zhytomyr, Kherson, Luhansk, and Dnipropetrovsk oblasts are distinguished by indicators where the values reach 50–85% in stage III, 30-48% in IV and 20–33.25 in V.

Accordingly, this affected the indicators of primary disability. As its cause, the pathology ranks second after chronic glomerulonephritis; among the total number (1795 and 1549 cases in 2016 and 2020, respectively), their percentage decreased from 27.5% to 20.0%, about 50% accounted for Dnipropetrovsk, Lviv, Mykolaiv oblasts.

Відомості про авторів

Сайдакова Наталія Олександрівна – ДУ «Інститут урології імені академіка О.Ф. Возіанова НАМН України», м. Київ

Пасєчніков Сергій Петрович – ДУ «Інститут урології імені академіка О.Ф. Возіанова НАМН України», м. Київ; тел.: (067) 4017761. *E-mail: uroprof1@gmail.com*

ORCID:0000-0003-1416-1262

Шуляк Олександр Владиславович – ДУ «Інститут урології імені академіка О.Ф. Возіанова НАМН України», м. Київ; тел.: (093) 287-08-85. *E-mail: avshulyak@hotmail.com*

ORCID: 0000-0002-6920-2212

Клюс Андрій Леонідович – ДУ «Інститут урології імені академіка О.Ф. Возіанова НАМН України», м. Київ; тел.: (067) 398-72-21. *E-mail: klus_a@ ukr.net*

ORCID: 000-0002-5001-2574

Кононова Галина Євгенівна – ДУ «Інститут урології імені академіка О.Ф. Возіанова НАМН України», м. Київ; тел.: (066) 040-91-92. *E-mail: urol.epid@gmail.com*

ORCID: 0000-0003-3284-3419

Мельничук Ярослав Миколайович – ДУ «Інститут урології імені академіка О.Ф. Возіанова НАМН України», м. Київ; тел.: (097) 755-73-15. *E-mail: problem-net@bigmir.net*

Information about the authors

Saidakova Nataliya O. – SI «Academician O.F. Vozianov Institute of Urology to NAMS of Ukraine», Kyiv

Pasiechnicov Serhii P. – SI «Academician O.F. Vozianov Institute of Urology to NAMS of Ukraine», Kyiv; tel.: (067) 401-77-61. *E-mail: uroprof1@gmail.com*

ORCID:0000-0003-1416-1262

Shulyak Olexandr V. – SI «Academician O.F. Vozianov Institute of Urology to NAMS of Ukraine», Kyiv; tel.: (093) 287-08-85. *E-mail: avshulyak@hotmail.com*

ORCID: 0000-0002-6920-2212

Klius Andrii L. – SI «Academician O.F. Vozianov Institute of Urology to NAMS of Ukraine», Kyiv; tel.: (067) 398-72-21. *E-mail: klus_a@ ukr.net*

ORCID: 000-0002-5001-2574

Kononova Galyna E. – SI «Academician O.F. Vozianov Institute of Urology to NAMS of Ukraine», Kyiv; tel.: (066) 040-91-92. *E-mail: urol.epid@gmail.com*

ORCID: 0000-0003-3284-3419

Melnichuk Yaroslav M. – SI «Academician O.F. Vozianov Institute of Urology to NAMS of Ukraine», Kyiv; tel.: (097) 755-73-15. *E-mail: problem-net@bigmir.net*

REFERRENCES

1. Anumudu S, Eknoyan G. Pyelonephritis: A Historical Reappraisal. J Am Soc Nephrol. 2019;30(6):914-7. doi: 10.1681/ASN.2019010017.

2. EAU Guidelines. In: 36th Annual EAU Congress [Internet]. 2021 March 19-23; Milan. Amsterdam: EAU; 2021. Available from: https://www.cancer. eu/eau-21thumb/.

3. Lisovyy VM, editor. Chronic pyelonephritis: method. decree. for students and interns. Kharkiv: KNMU; 2018. 20 p.

4. Mykhaylovska NS, editor. Algorithm of activity of the family doctor at the basic diseases of urinary system: teaching method way to practice classes and independent work of VI year students in the discipline. General practice - family medicine. Zaporizhzhya: ZDMU; 2018. 148 p.

5. Shulyak OV. Infektsiyi sechostatevykh shlyakhiv: piyelonefryt. Ukr med chasopys. 2014;4(102):32-41.

6. Abolghasemi S, Sali S, Mobasher Aghdam A, Shahrbaf MA. Anti-tuberculosis Induced Stevens - Johnson syndrome Due to Misdiagnosis of Mycobacterium abscessus Urinary Tract Infection as Tuberculosis. Iran J Kidney Dis. 2021;15(3):235-7.

7. Miftode IL, Nastase EV, Miftode RS, Miftode EG, Iancu LS, Luncă C, et al. Insights into multidrug-resistant K. pneumoniae urinary tract infections: From susceptibility to mortality. Exp Ther Med. 2021;22(4):1086. doi: 10.3892/etm.2021.10520.

8. Peck J, Shepherd JP. Recurrent Urinary Tract Infections: Diagnosis, Treatment, and Prevention. Obstet Gynecol Clin North Am. 2021;48(3):501-13. doi: 10.1016/j.ogc.2021.05.005.

9. Batirel A, Regmi SK, Singh P, Mert A, Konety BR, Kumar R. Urological infections in the developing world: an increasing problem in developed countries. World J Urol. 2020;38(11):2681-91. doi: 10.1007/s00345-020-03120-3.

10. Hudson C, Mortimore G. The diagnosis and management of a patient with acute pyelonephritis. Br J Nurs. 2020;29(3):144-50. doi: 10.12968/bjon.2020.29.3.144.

11. Chang UI, Kim HW, Noh YS, Wie SH. A comparison of the clinical characteristics of elderly and non-elderly women with community-onset, non-obstructive acute pyelonephritis. Korean J Int Med. 2015;30(3):372-83. doi: 10.3904/kjim.2015.30.3.372.

12. Herness J, Buttolph A, Hammer NC. Acute Pyelonephritis in Adults: Rapid Evidence Review. Am Fam Physician. 2020;102(3):173-80.

13. Bordino V, Vicentini C, D'Ambrosio A, Quattrocolo F; Collaborating Group, Zotti CM. Burden of healthcare-associated infections in Italy: incidence, attributable mortality and disability-adjusted life years (DALYs) from a nationwide study, 2016. J Hosp Infect. 2021;113:164-71. doi: 10.1016/j.jhin.2021.04.023.

14. Chernyak SI, editor. Osnovni pokaznyky invalidnosti ta diyalnosti medyko-sotsialnykh ekspertnykh komisiy Ukrayiny za 2016 rik: analityko-informatsiynyy dovidnyk. Dnipropetrovsk: Aktsent PP; 2017. 168 p.

15. Perepelychna RYA, editor. Osnovni pokaznyky invalidnosti ta diyalnosti medyko-sotsialnykh ekspertnykh komisiy Ukrayiny za 2020 rik: analityko-informatsiynyy dovidnyk. Dnipropetrovsk: Aktsent PP; 2021. 188 p.

16. Kolesnyk MO, editor. Natsionalnyi reiestr khvorykh na khronichnu khvorobu nyrok ta patsiientiv z hostrym poshkodzhenniam nyrok: 2017 rik. Kyiv: DU «Instytut nefrolohii NAMN Ukrainy; 2018. 183 p.

17. Kolesnyk MO, editor. Natsionalnyi reiestr khvorykh na khronichnu khvorobu nyrok ta patsiientiv z hostrym poshkodzhenniam nyrok: 2019 rik. Kyiv: DU «Instytut nefrolohii NAMN Ukrainy; 2020. 179 p.

18. Arefieva M, Hrytsulya M. Management tactics of patients with asymptomatic bacteria, cystitis and pyelonephritis: Recommendations of the European Association of Urology 2019. Med aspects of Women's Health. 2020;(1):45-53.

19. Johnson JR. Acute Pyelonephritis in Adults.N Engl J Med. 2018;378:48-59. doi: 10.1056/NEJMcp1702758.

20. El-Ghar MA, Farg H, Sharaf DE, El-Diasty T. CT and MRI in Urinary Tract Infections: A Spectrum of Different Imaging Findings. Medicina (Kaunas). 2021;57(1):32. doi: 10.3390/medicina57010032.

21. Jang YR, Won J, Han J, Chung W, Ahn SJ. Comparison of antimicrobial resistance in patients with obstructive pyelonephritis associated with ureteral stones and uncomplicated pyelonephritis. Medicine (Baltimore). 2022;101(34):e30376. doi: 10.1097/MD.0000000000030376.

22. Sundquist K, Li X, Jansåker F. Sociodemographic factors and uncomplicated pyelonephritis in women aged 15-50 years: a nationwide Swedish cohort register study (1997-2018). Int J Infect Dis. 2021;111:117-23. doi: 10.1016/j.ijid.2021.08.009.

23. Sułkowska K, Palczewski P, Furmańczyk-Zawiska A, Perkowska-Ptasińska A, Wójcik D, Szeszkowski W, et al. Diffusion Weighted Magnetic Resonance Imaging in the Assessment of Renal Function and Parenchymal Changes in Chronic Kidney Disease: A Preliminary Study. Ann Transplant. 2020;25:e920232. doi: 10.12659/AOT.920232.

24. Vernuccio F, Patti D, Cannella R, Salvaggio G, Midiri M. CT imaging of acute and chronic pyelonephritis: a practical guide for emergency radiologists. Emerg Radiol. 2020;27(5):561-7. doi: 10.1007/s10140-020-01788-z.

25. Saidakova NO, editor. The main indicators of urological care in Ukraine for 2016-2017: departmental publication. Kyiv: Polyum; 2018. 216 p.

26. Saidakova NO, editor. The main indicators of urological care in Ukraine for 2019-2020: departmental publication. Kyiv: Polyum; 2021: 123 s.

27. Anumudu S, Eknoyan G. Pyelonephritis: A Historical Reappraisal. J Am Soc Nephrol. 2019;30(6):914-7. doi: 10.1681/ASN.2019010017.

Стаття надійшла до редакції 03.10.2022. – Дата першого рішення 06.10.2022. – Стаття подана до друку 10.11.2022