obtained results were analyzed by statistical package SPSS 12.0. Mean IP-10 was 753,6 pg/ml among HIV/HBV co-infected patients with F3-4 and it was reliably higher than in F1-2 patients and healthy responders (p=0,005). This group had also higher level of IL-17A (37,54 pg/ml) than comparison groups (p=0,032). We found out strong correlation between increasing IP-10 (r=0,6), IL-17A (r=0,52) and fibrotic severity (p<0,05). High IP-10, IL-17A amount increases the risk of F3-4 formation in HIV/HBV patients.

Keywords: HIV/HBV-co-infection, interleukins, IP-10, IL-17A, liver fibrosis, West Zambia province.

РЕЗЮМЕ

ОЦЕНКА СОДЕРЖАНИЯ IL-17A И IP-10 В СЫВОРОТКЕ КРОВИ БОЛЬНЫХ С КОИНФЕКЦИЕЙ HBV/HIV В КАЧЕСТВЕ ПРЕДИКТОРОВ ФОРМИРОВАНИЯ ФИБРОЗА

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Цель исследования - усовершенствовать диагностику фиброза печени у больных с коинфекцией HIV/HBV с помощью определения содержания IP-10 и IL-17A в сыворотке крови.

Под наблюдением находилось 53 пациента Lewanika General Hospital (Западная Замбия) с HIV/HBV-коинфекцией и 21 здоровых доноров крови (контрольная группа). Диагноз устанавливали, основываясь на результатах позитивных маркеров инфекции, биопсии печени. Проводили иммунно-ферментный анализ с идентификацией IP-10 и IL-17A в сыворотке крови. Полученные результаты оценивали с помощью пакета статистических программ SPSS v12.0.

У больных HIV/HBV с F3-4 содержание IP-10 составило 753,6 пг/мл, что достоверно выше, чем у больных с F1-2 и респондентов контрольной группы (p=0,005). Наряду с этим, у них отмечалось более высокое содержание IL-17A (37,54 пг/мл) (p=0,032). Установлена сильная корреляционная связь между возростанием IP-10 (r=0,6) и IL-17A (r=0,52) и выраженностью фиброза печени (p<0,05).

Таким образом, следует заключить, что повышенное содержание IP-10 и IL-17A увеличивает шансы на развитие F3-4 у больных HIV/HBV.

რეზიუმე

IL-17A-ის და IP-10-ის შემცველობა HBV/HIV-კოინფექციით პაციენტების სისხლის შრატში, როგორც ფიბროზის განვითარების პრედიქტორი

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კვლევის მიზანს წარმოადგენდა ღვიძლის ფიბროზის დიაგნოსტიკის სრულყოფა სისხლის შრატში IL-17A-ის და IP-10-ის შემცველობის განსაზღვრის საშუალებით პაციენტებში HBV/HIV-კოინფექციით.

დაკვირვების ქვეშ იმყოფებოდა Lewanika General Hospital-ის (სამხრეთ ზამბია) 53 პაციენტი HBV/HIV-კოინფექციით და 21 ჯანმრთელი დონორის სისხლი (საკონტროლო ჯგუფი). დიაგნოზი დგინდებოდა ინფექციის მარკერების დადებითი შედეგების და ღვიძლის ბიოფსიის საფუძველზე. ჩატარებულია იმუნოფერმენტული ანალიზი IL-17A-ის და IP-10-ის იდენტიფიკაციით სისხლის შრატში. მიღებული შედეგები შეფასებულია სტატისტიკური პროგრამით SPSS v12.0. პაციენტებში HBV/HIV-კოინფექციით და F3-4-ით IP-10-ის შემცველობამ შეადგინა 753,6 პგ/მლ, რაც სარწმუნოდ მეტია, ვიდრე პაციენტებში F1-2-ით და საკონტროლო ჯგუფის რესპოდენტებში (p=0,005). მათ, ასევე, აღენიშნებოდათ IL-17A-ს მეტი შემცველობა (37,54 პგ/მლ), შედარების ჯგუფებთან მიმართებით (p=0,032). დადგენილია მაღალი კორელაციური კავშირი IL-17A-ს (r=0,52) და IP-10-ის (r=0,6) მატებასა და ღვიძლის ფიბროზის გამოხატულებას შორის (p<0,05). IL-17A-ის და IP-10-ის მომატებული შემცველობა ზრდის F3-4-ის განვითარების ხარისხს პაციენტებში HBV/HIV-კოინფექციით.

MODERN ETIOLOGICAL STRUCTURE OF ACUTE GASTROENTEROCOLITIS IN THE SOUTHERN UKRAINE

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The relevance of acute diarrhoeal infections (ADI) does not raise doubts, in view of heavy complications and outcomes at the children of early age [1,4,6,9]. Due to ADI, daily in the world about 4 thousand children, in developing countries, die under 2 years old; in economically developed countries a high incidence rate of this pathology is also registered [8,12,13]. Diarrhoeal disease is the second leading cause of death in children under 5 years old – each year diarrhoea kills around 525,000 children under 5. According to data of WHO, up to 20-70% of all cases of diarrhea on the Earth it is caused by rotaviruses [8].

High level of modern laboratory diagnostics allows to detect up to 50% of possible virus causative agents of ADI, at the same time a significant part of etiological factors remain undetected [2,3,10,11]. According to modern data, the most common caus-

ative agents of viral gastroenteritis (GEC) include rota-, noro-, adeno-, entero-, astro-, boca-, and coronaviruses [2,9,15]. The study of the epidemic process of ADI, conducted in Baku, established the leading role of enterovirus infection (EVI) in the 0-2 age group [14]. Being no vaccine-preventable and characterized by the outbreak nature of the epidemic process with the development of severe clinical forms, EVI is a serious public health problem in almost all countries of the world, including post-Soviet states [6,13-15]. In many countries, outbreaks of ADI, associated with the use of meals that have not undergone heat treatment, as well as contact with water, which was used for recreational purposes, are diagnosed [5,7]. On the territory of Primorsky Krai, outbreaks of norovirus infection in organized groups of children and adolescents were described; in most cases, the source of infection were employees of the nutrition departments of children's preschool and other educational institutions, and the transfer factors were cooked meals that were not subjected to heat treatment [15].

Material and methods. The main materials were annual and monthly reports on infectious and parasitic incidence among the general and child population (f-1, f-2) for 2015-2017, provided by State Institution "Odesa Oblast Laboratory Center of State Ministry of Health of Ukraine" (SI "Odesa OLC SMHU") – 6 reports and 4,390 statistical cards (f-066 /o) of patients who were hospitalized with the diagnosis of ADI in Communal Institution "Odesa Municipal Clinical Infectious Hospital" (CI "Odesa MCIH") in 2015-2017 and left the hospital.

We conducted research of 228 fecal samples from adult patients who was hospitalized at CI «Odessa MCIH» with the diagnosis of ADI in June-August, 2016. The age of patients was from 19 to 88 years old. To determine the antigens of rota-, noro-, adeno-, astroviruses in fecal samples, chromatographic rapid tests of «PHARMACO Ltd» (Italy) were used. The results of the genotyping of the detected rotaviruses were carried out the virological laboratory of SI "Odesa OLC SMHU".

Results and their discussion. The etiological structure of ADI during 2015-2017 was analyzed. Comparative analysis of the age structure of sick persons was carried out. Tables 1 and 2 show the data on the number of registered cases of diseases and hospitalized patients at CI "Odesa MCIH" (which performs at the same time the function of the regional hospital, undertaking the main hospital loading).

During 2015-2017 in the Odessa region, there were 9 cases of typhoid fever, including 5 cases among adults, 4 among children (44,44%). In 2,015.2 cases of typhoid fever were registered, 1 of which was among children; in 2016 – 3 cases among adults; in 2017 – 4 cases, 3 of which were among children under 17 years old. Given the severity of the disease, the frequency of complications and the possible threat to the patient's life, all patients with typhoid fever were hospitalized and treated in an infectious hospital.

1,879 persons, including 1,062 adults (56,52%), 817 children (43,48%), were ill salmonellosis. Of these, 1,423 people were hospitalized (75,73% of the number of registered cases), including 770 adults (54,11%), 653 children (45,89%). During the study period, 71 children under 1 year old were diagnosed with salmonellosis (10.87% of the under 17 age group). On average, 354.0 cases of the disease were registered annually among adults, 256,67 of which were hospitalized (72,51%). Among children 272,33 cases were registered and 217,67 cases were hospitalized (79,93%). Thus, salmonellosis among adults was registered more often than among children, but with an statistical unreliable difference (t=1,96; p=0,19), with a high rate of hospitalization (72,51 and 79,93% of cases, respectively).

Over the study period, only 290 people of different ages got ill with dysentery, of which 135 were hospitalized (46,55%). Among children under 17 years old, 191 cases of dysentery were registered (65,86%), including 9 – under 1 year old; among adults, 99 cases (34,14%). Total of 86 children (45,03%) and 49 adults (49,50%) were hospitalized. On average, 33,0 cases of dysentery were registered annually among adults, 16.33 of which were hospitalized (49,49%); among children, 63,67 cases of dysentery were registered annually and 28,67 cases, respectively, were hospitalized (45,03%). Thus, dysentery was registered statistically valid more often among children (t=4,82; p<0,05), with a low rate of hospitalization among the compared groups.

During the study period, 10,890 people, including 8,473 children (77,80%) and 2,417 adults (22,20%), were registered GEC (including foodborne toxicoinfections and intoxication) with a detected bacterial causative agent. 4,275 people of different ages were hospitalized in total (39,26% of all registered cases) – 979 adults (8,99%) and 3,296 children (30,27%), including 1,035 children under 1-year-old (31,40% of all hospitalized children under 17 years old). Every year, 3,630,0 cases of the disease

Table 1. The proportion of hospitalized adults with ADI of arious etiologies

Disease	2015		2016		2017		M (2015-2017)	
	1	2 (%)	1	2 (%)	1	2 (%)	1	2 (%)
Typhoid fever	1	1 (100,0)	3	3 (100,0)	1	1 (100,0)	1,67	1,67 (100,0)
Salmonellosis	233	133 (57,08)	552	421 (76,27)	277	216 (77,98)	354,0	256,67 (72,51)
Dysentery	31	3 (9,68)	44	23 (52,26)	24	23 (95,83)	33,0	16,33 (49,49)
GEC of established etiology	834	342 (41,01)	757	202 (26,68)	826	435 (52,66)	805,67	326,33 (40,50)
Rotavirus infection	4	2 (50,0)	10	9 (90,0)	3	3 (100,0)	5,67	4,67 (82,36)
GEC caused by unidentified path.	3,380	2,529 (74,82)	3,699	2,575 (69,61)	3760	3,333 (88,64)	3,613,0	2,812,3 (77,84)
The sum of cases of ADI	4,483	3,010 (67,14)	5,068	3,238 (63,69)	4,891	4,018 (82,15)	4,814,0	3,422,0 (71,08)

note: 1 – the number of registered cases, 2 – the number of hospitalized persons, the proportion, %

Table 2. The proportion of hospitalized children under 17 years old with ADI of various etiologies

Disease	2015		2016		2017		M ($_{2015-2017}$)	
	1	2(%)	1	2 (%)	1	2 (%)	1	2 (%)
Typhoid fever	1	1 (100,0)	0	0 (0,0)	3	3 (100,0)	1,33	1,33 (100,0)
Salmonellosis	190	134 (70,53)	387	320 (82,69)	240	199 (82,92)	272,33	217,67 (79,93)
Dysentery	61	9 (14,75)	86	41 (47,67)	44	36 (81,81)	63,67	28,67 (45,03)
GEC of established etiology	3,052	1,056 (34,60)	2,614	898 (34,35)	2,807	1,342 (47,81)	2,824,33	1,098,67 (38,90)
Rotavirus infection	787	662 (84,12)	628	444 (70,70)	771	667 (86,51)	728,67	591,0 (81,11)
GEC caused by unidentified pathogen	7,276	6,649 (91,38)	7,504	7,183 (95,72)	8,560	8,103 (94,66)	7,780,0	7,311,67 (93,98)
The sum of all cases of ADI	11,367	8,511 (74,87)	11,219	7,989 (71,21)	12,425	10,376 (83,51)	11,670,33	8,958,67 (76,77)

note: 1 – the number of registered cases, 2 – the number of hospitalized persons, the proportion,%

Table 3. The average age structure and the proportion of the children with ADI in 2015-2017

Group size on 01/01/2017	Age groups, %					
	0-1	1-4	5-10	11-14	15-17	Total
	27,244 (5,99)	117,549 (25,84)	137,623 (30,25)	110,173 (24,21)	62,369 (13,71)	454,958
The average number of registered cases of the disease (2015-2017), the proportion,%						
GEC of established etiology	649,00 (22,98)	1,572,00 (55,66)	405,33 (14,35)	143,67 (5,09)	54,33 (1,92)	2,824,33 (100)
GEC caused by unidentified pathogen	814,67 (10,47)	4,055,67 (52,13)	1,960,67 (25,20)	683,00 (8,78)	266,00 (3,42)	7,780,00 (100)
Rotavirus infection	94,33 (12,95)	518,67 (71,18)	102,67 (14,09)	13,00 (1,78)	0 (0)	728,67 (100)
The sum of all cases of ADI	1,558,00 (13,75)	6,146,34 (54,23)	2,468,67 (21,78)	839,67 (7,41)	320,33 (2,83)	11,333,00 (100)

were registered on average, of which 1,425,0 cases were hospitalized (39.26%).

Thus, GEC with the detected bacterial causative agent were registered mainly among children (77,80%) (t=19,06; p<0,005), but no more than one third of them were hospitalized, mostly they were children of younger age groups.

During the analyzed period, 2,203 people, including 17 adults (0,77%) and 2,186 children (99,23%), got rotavirus infection (RVI). Of the cases, 14 adults and 1,773 children (81,11%) were hospitalized, including children under 1 year old – 267 (15.02%), 1-4 year-old – 1,100 (62,02%), 5-10-year-old – 352 (19,88%), 11-14-year-old – 44 children (2,48%), 15-17 year-old – 10 (0,58%). Among the children's population, RVI was registered mainly in 1-4 year-old, the frequency of hospitalization in this age group was high.

During 2015-2017, 34,179 cases of GEC with an unidentified bacterial causative agent were registered, including 23,340 among children (68,29%) and 10,839 among adults (31,71%). 30,372 people of different ages were hospitalized (88,89% of the number of all registered cases), including 21,935 children (93,98% of the number of all registered cases of the group) and 8437 adults (77,84%). Every year, on average, 11,393 cases of the disease were registered, 10,124 of which were hospitalized (88,86%). Cases of GEC with an unidentified bacterial causative agent were registered statistically valid more often among the child population (t=13,12; p<0,01), with a high frequency of hospitalization of children and adults.

49,453 cases of AGI were registered in total, including 35,011 among children (70,79%) and 14,442 among adults (29,20%). 37,132 people of different ages were hospitalized (75,09% of the registered cases), including 26,876 children (76,76% of the total number of registered cases of the group) and 10,266 adults (71,08%). 16,484,33 cases of this group of diseases, on average, were recorded annually, of which 12,377,33 cases were hospitalized (75,09%). In general, ADI were significantly more frequently registered among the child population (t=17,16; p<0,005), with a high frequency of hospitalization among children and adults (Table 4).

In January 1, 2018, 454,958 children under 17 years old lived in the territory of the Odesa region, each age group had a different proportion. We compared the number of diseased by RVI, GEC with detected and unidentified causative agents, depending on the size of the group (Table 3). The proportion of children under 1 year old was 5,99%. Every sixth or seventh case of hospitalization with RVI, third or fourth case – with GEC with a detected causative agent, seventh-eighth case – with GEC with an unidentified pathogen and, on average, every fifth case of hospitalization with AGI were children in this age group. The propor-

Table 4. The average age structure and the proportion of the children hospitalized with the diagnosis of ADI during 2015-2017

Group size on 01/01/2017	Age groups, %					
	0-1	**1-4**	**5-10**	**11-14**	**15-17**	**Total**
	27,244 (5,99)	117,549 (25,84)	137,623 (30,25)	110,173 (24,21)	62,369 (13,71)	454,958
The average number of registered cases of the disease (2015-2017), the proportion,%						
GEC of established etiology	252,33 (28,35)	484,00 (54,38)	110,00 (12,36)	25,67 (2,89)	18,00 (2,02)	890,00 (100)
GEC caused by unidentified pathogen	555,33 (13,00)	2,379,67 (55,72)	979,67 (22,94)	216,67 (5,07)	139,67 (3,27)	4,271,00 (100)
Rotavirus infection	89,00 (15,06)	366,67 (62,04)	117,33 (19,85)	18,00 (3,05)	0 (0)	591,00 (100)
The sum of all cases of ADI	896,66 (15,59)	3,230,34 (56,16)	1,207,00 (20,98)	260,34 (4,53)	157,67 (2,74)	5752,00 (100)

Table 5. Etiological structure of detected causative agents from children hospitalized with ADI during 2015

Cauative agent 0-1		**The numbers and proportions (%) of the detected causative agents from children of different age groups**					
		1-4	**5-10**	**11-14**	**15-17**	**Σ, total**	
Rotavirus		84 (18,71)	461 (54,24)	108(54,54)	7(30,44)	0	660
Staphylococcus aureus		251 (55,90)	181(21,29)	29 (14,65)	4 (17,39)	4 (28,57)	469
Klebsiella pneumoniae	51 (11,36)	87 (10,24)	26 (13,13)	4 (17,39)	6 (42,86)	174	
Proteus vulgaris	30 (6,68)	59 (6,94)	15 (7,58)	3(13,04)	1 (7,14)	108	
Enterobacter cloacae	8 (1,78)	28 (3,29)	8 (4,04)	2(8,70)	1(7,14)	47	
Proteus mirabilis	10 (2,22)	11 (1,29)	0	0	0	21	
Enterobacter aerogenes	5 (1,11)	9 (1,06)	3 (1,52)	1 (4,35)	0	18	
Citrobacter freudii	4 (0,89)	7 (0,82)	2 (1,01)	1 (4,35)	1 (7,14)	15	
Pseudomonas aeruginosa	4 (0,89)	5 (0,59)	6 (3,03)	0	0	15	
Vibrio cholerae	0	1 (0,12)	1 (0,51)	0	0	2	
Morganella	1(0,22)	0	0	0	1 (7,14)	2	
Citrobacter species	1 (0,22)	0	0	0	0	1	
Enterococcus spp.	0	1 (0,12)	0	0	0	1	
Vibrio parahemoliticus	0	0	0	1 (4,35)	0	1	
Total	449	850	198	23	14	1,534	

tion of 1-4-year-old children was 25,84%; and every second case of hospitalization with RVI, GEC with a detected causative agent, GEC with an unidentified pathogen and, on average, every second case of hospitalization with AGI were children in this age group. The proportion of 5-10-year-old children was 30,25%. Every fifth case of hospitalization with RVI, eighth case – with GEC with a detected causative agent, fourth case – with GEC with an unidentified pathogen and, on average, every fifth-sixth case of hospitalization with AGI were children in this age group.

The analysis of the age structure of the diseased of ADI of children showed that 1-4-year-old children had these diseases more often than others. This age group is a quarter of the children's population in the region; 62.02% of cases with RVI, 54.39% of cases with GEC with a detected causative agent, 55.79% of cases with GEC with an unidentified causative agent were registered in 1-4-year-old children. On average, 15.04% of cases with RVI, 28.35% of cases with GEC with a detected causative agent, 12.90% of cases with GEC with an unidentified causative agent were registered in children under 1 year old. 19.88% of cases with RVI, 12.36% of cases with GEC with a detected causative agent, 22.96% of cases with GEC with an unidentified causative agent were registered in 5-10-year-old children. Among 11-14-year-old adolescents 2.48% of cases of RVI, 2.88% of cases of GEC with a detected causative agent, and 5.08% of cases GEC with an unidentified agent were registered. Among 15-17-year-old teenagers, 0.58% of cases of RVI, 2.02% of cases of GEC with a detected causative agent, and 3.27% of cases of GEC with an unidentified causative agent were registered.

Thus, registration of RVI, GEC with an detected and unidentified causative agents occurs mainly among young children. Children under 1 year old were about one seventeenth of the total number of children in the Odesa region, 13.75% of cases of ADI are registered among this group on average. 1-4-year-old children were more than a quarter of the child population in the Odesa region and 54,23% of cases of ADI were registered in this age group, while 5-10-year-old children were more than a third of the child population and of them 21,78% got ill this pathol-

Table 6. Etiological structure of detected causative agents from children hospitalized with ADI during 2016

Causative agent	The numbers and proportions (%) of the detected causative agents from children of different age groups					
	0-1	**1-4**	**5-10**	**11-14**	**15-17**	**Σ, total**
Staphylococcus aureus	204 (52,17)	253 (42,45)	29 (20,86)	5 (17,24)	3 (25,00)	494
Rotavirus	128 (32,74)	224 (37,58)	67 (48,20)	13 (44,83)	0 (0)	432
Klebsiella pneumoniae	38 (9,72)	42 (7,05)	15 (10,79)	4 (13,79)	1 (8,33)	100
Pseudomonas aeruginosa	5 (1,28)	19 (3,19)	14 (10,07)	3 (10,34)	6 (50,00)	47
Enterobacter cloacae	2 (0,51)	15 (2,52)	6 (4,32)	1 (3,45)	1 (8,33)	25
Enterobacter aerogenes	4 (1,02)	12 (2,01)	4 (2,88)	0	0	20
Proteus mirabilis	0	14 (2,35)	1 (0,72)	0	0	15
Citrobacter freudii	0	4 (0,67)	2 (1,44)	2 (6,90)	1 (8,33)	9
Proteus vulgaris	2 (0,51)	3 (0,50)	1 (0,72)	0	0	6
Klebsiella oxytoca	0	3 (0,50)	0	0	0	3
Vibrio alginolyticus	0	0	0	1 (3,45)	0	1
Staphylococcus aureus + Klebsiella pneumoniae	4 (1,02)	3 (0,50)	0	0	0	7
Staphylococcus aureus + Pseudomonas aeruginosa	1 (0,26)	1 (0,17)	0	0	0	2
Staphylococcus aureus + Proteus vulgaris	1 (0,26)	0	0	0	0	1
Staphylococcus aureus + Enterobacter cloacae	0	1 (0,17)	0	0	0	1
Staphylococcus aureus + Helicobacter pylori	1 (0,26)	0	0	0	0	1
Staphylococcus aureus + Enterobacter aerogenes	1 (0,26)	0	0	0	0	1
Staphylococcus aureus + Pseudomonas aeruginosa	0	1 (0,17)	0	0	0	1
Staphylococcus aureus + Pseudomonas aeruginosa+ Citrobacter freudii	0	1 (0,17)	0	0	0	1
Total	391 (33,50)	596 (51,07)	139 (11,91)	29 (2,49)	12 (1,03)	1,167

ogy. 11-14-year-old children were about a quarter of the child population; among them 7.41% of cases of ADI were registered. 15-17-year-old children were 13.71% of the child population; among them 2.83% of cases of ADI were registered.

According to the results of the research, every 36th child under 1 year old living in Odesa region was hospitalized with GEC when an infectious causative agent was detected.

This does not exclude the participation of rotaviruse in the occurrence of ADI cases, in cases of GEC with an unidentified pathogen, including among children over 15 years old and adults, since not everyone is tested for viral pathogens.

Characteristics of the etiological structure of OKA in 2015-2017

We analyzed in detail etiological structure of ADI of hospitalized children in 2015-2017. In 2015, among 1,534 hospitalized children with ADI with a detected causative agent (including RVI), 449 children were under 1 year old (29.27%). 13 different bacterial causative agents were isolated from children of different ages (Table 5).

Most often diarrheal diseases in people in this age group were caused by *Staphylococcus aureus* (55.90% of cases), *Rotavirus* (18.71%) and *Klebsiella pneumoniae* (11.36%), and other causative agents (14.03%).

In 2015, children aged 1-4 years represented 55.41% (850 out of 1,534) of the total number of hospitalized. The etiological structure was presented by the same causative agents, but rotavirus disease is prevailing: *Rotavirus* (54.24% of all cases), *St. aureus* (21.29%), *Kl. pneumoniae* (10.24%), and other causative agents (14.23%).

5-10-year-old children were 12.91% of all hospitalized children (198 out of 1,534). RVI was also predominant among children in this age group: *Rotavirus* (54.54% of all cases), *St. aureus* (14.65%), *Kl. pneumoniae* (13.13%), *Proteus vulgaris* (7.58%) and other causative agents (10.10%).

Hospitalized 11-14-year-old adolescents were 1.50% of the total number of hospitalized children (23 out of 1,534), 15-17-year-old – 0.91% (14 out of 1,534). The etiological structure was represented by the following pathogens: *Rotavirus* (30.44% and 0% of all cases, respectively), *St. aureus* (17.39% and 28.57%), *Kl. pneumoniae* (17.39% and 42.86%), *Pr. vulgaris* (13.04% and 7.14%), and other pathogens (21.74% and 21.43%, respectively).

Thus, children from 0 to 1 year old and from 1 to 4 years old most often got ill ADI. In 2015, among 0–17-year-old children, the leading in etiological structure of diarrheal diseases

was *Rotavirus* (43.02%), *St. aureus* (30.57%), *Kl. pneumoniae* (11.34%) and *Pr. vulgaris* (7.04%); the other pathogens, in general, were 8.03%.

In 2016 among all hospitalized with ADI children, children under 1 year old were 33.50% (391 out of 1,167 people) (Table 6). The most frequently in children of this age group diarrheal diseases were caused by: *St. aureus* (52.17% of all cases), Rotavirus (32.74%), *Kl. pneumoniae* (9.72%), and other pathogens (5.37%).

In 2016, 1-4-year-old children were 51.07% of the total number of hospitalized (596 out of 1,167). Among the detected causative agents again prevailed: *St. aureus* (42.45% of all cases), *Rotavirus* (37.58%), *Kl. pneumoniae* (7.05%), and other pathogens (12.92%).

5-10-year-old children were hospitalized in 11.91% of cases (139 out of 1,167). Rotavirus infection was predominant in this age group: *Rotavirus* (48.20% of all cases), *St. aureus* (20.86%), *Kl. pneumoniae* (10.79%), *Pseudomonas aeruginosa* (10.07%), *Enterobacter cloacae* (4.32%) and other pathogens (5.76%).

11-14-year-old adolescents accounted for 2.49% of the total number of hospitalized children (29 out of 1,167), 15-17-year-old – 1.03% (12 out of 1,167). The etiological structure of causative agents: *Rotavirus* (44.83% and 0%, respectively), *St. aureus* (17.24% and 25.00), *Kl. pneumoniae* (13.79% and 8.33%), *Ps. aeruginosa* (10.34% and 50.00%), *Ent. cloacae* (3.45% and 8.33%), *Citrobacter freudii* (6.90% and 8.33%), and other pathogens (3.45% and 0%).

Thus, children aged 0-1-year-old and 1-4-year-old most often got ill. In 2016, the leading causative agents isolated from children (0-17-year-old) with diarrheal diseases were: *St.aureus* (42.33%), *Rotavirus* (37.02%), *Kl. pneumoniae* (8.57%), *Ps. aeruginosa* (4.03%); other causative agents accounted for 8.05% of the total number of children.

In 2017, among 1,689 children hospitalized with the diagnosis of ADI were 173 children under 1 year old (10.24%) (Table 7). Most often in children in this age group *St. aureus* was detected

Table 7. Etiological structure of detected causative agents from children hospitalized with ADI during 2017

Causative agent	The numbers and proportions (%) of the detected causative agents from children of different age groups					
	0-1	1-4	5-10	11-14	15-17	Σ, total
Rotavirus	46 (25,59)	383 (35,63)	169 (50,15)	23 (33,82)	10(26,32)	631
Staphylococcus aureus	79 (45,66)	411 (38,23)	64 (18,99)	14 (20,59)	12(31,58)	580
Klebsiella pneumoniae	29 (16,76)	143 (13,30)	47 (13,95)	15 (22,05)	10(26,32)	244
E.coli	2 (1,16)	40 (3,72)	25 (7,42)	2 (2,94)	2 (5,26)	71
Pseudomonas aeruginosa	2 (1,16)	22 (2,05)	14 (4,15)	10 (14,71)	1 (2,63)	49
Enterobacter cloacae	3 (1,73)	20 (1,86)	7 (2,08)	1 (1,47)	0	31
Enterobacter aerogenes	5 (2,89)	10 (0,93)	5 (1,48)	0	2 (5,26)	22
Proteus mirabilis	0	13 (1,21)	3 (0,89)	0	0	16
Citrobacter freudii	1 (0,58)	6 (0,56)	0	2 (2,94)	0	9
Morganella morganii	1 (0,58)	0	0	0	0	1
Salmonella enteritidis	0	1 (0,09)	0	0	0	1
V.parahemoliticus	1 (0,58)	0	0	0	0	1
Klebsiella pneumoniae + Rotavirus	0	7 (0,65)	2 (0,59)	0	0	9
Staphylococcus aureus + Klebsiella pneumoniae	2 (1,16)	6 (0,56)	0	0	0	8
Staphylococcus aureus + Rotavirus	0	7 (0,65)	0	0	0	7
Pseudomonas aeruginosa + Klebsiella pneumoniae	1 (0,58)	1 (0,09)	1(0,3)	0	0	3
Staphylococcus aureus + Rotavirus + Klebsiella pneumoniae	0	1 (0,09)	0	1 (1,47)	0	2
Staphylococcus aureus + Escherichia coli	0	1 (0,09)	0	0	1 (2,63)	2
Staphylococcus aureus + Rotavirus + Pseudomonas aeruginosa	0	1 (0,09)	0	0	0	1
Staphylococcus aureus + Enterobacter cloacae	0	1 (0,09)	0	0	0	1
Pseudomonas aeruginosa + Rotavirus	0	1 (0,09)	0	0	0	1
Staphylococcus aureus + Proteus mirabilis	1 (0,58)	0	0	0	0	1
Total	173 (10,24)	1,075 (63,65)	337 (19,95)	68 (4,03)	38(2,25)	1,689

– 45.66%, slightly less: *Rotavirus* (25.59% of cases), *Kl. pneumoniae* (16.76%), and other pathogens (11.99%).

1-4-year-old children were 63.65% (1,075 out of 1,689) of the total number of hospitalized in 2017. The following pathogens were detected: *St.aureus* (38.23% of all cases), *Rotavirus* (35.63%), *Kl. pneumoniae* (13.30%), *E. coli* (3.72%), other pathogens (9.12%).

5-10-year-old children were hospitalized in 19.95% of cases (337 out of 1,689). The rotavirus infection was the prevailing cause of ADI among the hospitalized children of the specified age group: *Rotavirus* (50.15% of cases), *St. aureus* (18.99%), *Kl. pneumoniae* (13.95%), *E. coli* (7.42%) and other activators (9.49%).

11-14-year-old adolescents were about 4.03% of the total number of hospitalized children (68 out of 1,689), 15-17-year-old – 2.25% (38 out of 1,689). The etiological structure was represented by: *Rotavirus* (33.82% and 26.32%, respectively), *St. aureus* (20.59% and 31.58%), *Kl. pneumoniae* (22.05% and 26.32%), *Ps. aeruginosa* (14.71% and 2.63%), *E. coli* (2.94% and 5.26%) and other pathogens (5.89% and 7.89%, respectively).

Thus, in 2017, children from 1 to 4 years old and from 5 to 10 years old most often got ill ADI. In 2016, the leading pathogens detected in 0-17-year-old children with diarrheal diseases were: *Rotavirus* (37.36%), *St. aureus* (34.34%), *Kl. pneumoniae* (14.44%), *E. coli* (4.20%), *Ps. aeruginosa* (2.90%), other pathogens (6.76%).

We carried out a examine of 228 fecal samples for virus antigens using chromatographic tests. The material was taken from patients hospitalized during the summer period from June to August 2016. 339 examines were carried out in total. Among the examined patients were 134 women and 94 men. It was examined: on *Rotavirus* antigens – 100 samples, 15 of them are positive (15.00%); on the *Norovirus Genogroups 1 and 2* – 228 samples, 15 of them are positive (6.58%); *Astrovirus* – 1 sample, the patient with a RVI had a positive result; *Adenovirus* – 10 samples were examined, with no positive results.

Thus, antigens of 31 viruses (13.60%) were detected in 228 samples of test material. In one sample, *Rotavirus* and *Astrovirus* antigens were detected.

Genotyping of the circulated rotavirus strains on territory of the Odessa region was performed, and found their wide variety: 5 common rotavirus strains – G1P [8], G3P [8], G4P [8], G9P [8], G2P [4], and 6 uncommon rotavirus strains: G1P [4], G6P [9], G3P [9], G12P [6], G12P [8], G4P [4].

In 2015, two strains dominated: G4P [8] – 32.5% and G1P [8] – 23.0%; in 2016, the dominant strains were: G1P [8] – 46.7% and G3P [8] – 26.7%. Infection of children under 2 years old with arotavirus G1 [8] P strain was accompanied by a more hard clinical course, with diarrhea duration of 1.5-2 days in average longer than wit other strains of rotaviruses.

Conclusion. 1. The catalogue of bacterial causative agents, isolated from ADI patients, registered in Odesa region during the study period, was presented 18 pathogens, the roster of which from year to year could change very slightly. Domination of such pathogens as *St.aureus, Kl.pneumoniae, Ps.aeruginosa, E.coli, Pr.vulgaris, Ent.cloacae* was registered, and in some cases the mixed infection was noted at which 2 and more causative agents were isolated from a patient's fecal sample (2016 – 1.29%; 2017 – 2.07%).

2. During 2016-2017 the mixed infection was registered in 54 patients. Bacterial-virus associations of causative agents were noted in 20 samples and presented: *St. aureus, Kl. pneumoniae*, *Ps. Aeruginosa* and *Rotavirus*.

3 Frequency of detection of rota-, noro-, adenovirus antigens in the examined fecal samples of adult patients were 13.60%.

4. A wide variety of rotaviruses circulate in the territory of the Odesa region. In 2015-2016 the predominant strains were: G4P [8], G1P [8] and G3P [8].

5. Modern feature of the epidemic process of ADI in Odessa region is a wide variety of both, viral and bacterial causative agents, and their multiple combinations.

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SUMMARY

MODERN ETIOLOGICAL STRUCTURE OF ACUTE GASTROENTEROCOLITIS IN THE SOUTHERN UKRAINE

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The etiological structure of the acute diarrhoeal infections among the population of the Odessa region during 2015-2017 was analyzed. Based on the registered cases, an assessment of the frequency of hospitalization of sick persons from different age groups was undertaken. The most frequent pathogens from 18 detected bacterial causative agents were *St. aureus, Kl. pneumoniae, Ps. aeruginosa, E. coli, Pr. vulgaris, Ent.cloacae.* During 2016-2017 the mixed infection was detected in 54 fecal samples. Bacterial-virus associations were detected in 20 samples and were presented in *St. aureus, Kl. pneumoniae, Ps. Aeruginosa and Rotavirus.* During the summer period of 2016, the detection rate of rota-, noro-, adenovirus antigens in the examined fecal samples of adult patients was 13.60%. According to the results of genotyping of the circulating rotaviruses strains in 2016, strains G1P[8] (46.70%) and G3P[8] (26.70%) are most commonly detected.

Keywords: aetiological pattern, acute diarrhoeal infections.

РЕЗЮМЕ

СОВРЕМЕННАЯ ЭТИОЛОГИЧЕСКАЯ СТРУКТУРА ОСТРЫХ ГАСТРОЭНТЕРОКОЛИТОВ НА ЮГЕ УКРАИНЫ

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Целью исследования явилось изучение современной этиологической структуры острых гастроэнтероколитов. Основными материалами послужили годовые и месячные отчеты об инфекционной и паразитарной заболеваемости общего и детского населения (формы №1, №2), предоставленные ГУ «Лабораторный центр МЗ Украины в Одесской области» за 2015-2017 гг. – 6 отчетов и 4390 статистических карт (форма № 066/о) выбывших из стационара больных, госпитализированных с осторой кишечной инфекцией (ОКИ) в Одесскую городскую клиническую инфекционную больницу» в 2015-2017 гг. Для определения антигенов рота-, норо-, адено-, астровирусов в образцах фекалий использовали хроматографические экспресс-тесты фирмы Фармаско (Италия).

Проанализирована этиологическая структура ОКИ среди населения Одесской области на протяжении 2015-2017 гг. Проведена оценка частоты госпитализации заболевших лиц различных возрастных групп с учетом зарегистрированных случаев. Из 18 выделенных бактериальных возбудителей наиболее часто встречались: *St. aureus*, *Kl. pneumoniae*, *Ps. aeruginosa, E. coli*, *Pr. vulgaris, Ent. cloacae*. На протяжении 2016-2017 гг. смешанное инфицирование обнаружено в 54 пробах фекалий. Бактериально-вирусные ассоциации отмечены в 20 пробах и представлены: *St. aureus*, *Kl. pneumoniae*, *Ps. Aeruginosa и Rotavirus.* Проведено исследование 228 образцов фекалий от взрослых пациентов с ОКИ, находившихся на стационарном лечении в июне-августе 2016 г. Возраст заболевших составил от 19 до 88 лет. Частота выявления антигенов: рота-, норо-, аденовирусов в исследованных пробах фекалий взрослых пациентов в летний период 2016 г. составила 13,60%. Результаты генотипирования выявленных ротавирусов предоставлены вирусологической лабораторией ГУЛЦМЗУ в Одесской области. Генотипирование выявленных в 2016 г. ротавирусов выявило доминирование генотипов G1P[8] – 46,70% и G3P[8] – 26,70%.

Современной особенностью эпидемического процесса ОКИ в Одесской области является широкое разнообразие как вирусных, так и бактериальных возбудителей и их множественные сочетания.

რეზიუმე

მწვავე ენტეროკოლიტების თანამედროვე ეტიოლოგიური სტრუქტურა სამხრეთ უკრინაში

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კვლევის მიზანს წარმოადგენდა მწვავე ენტეროკოლიტების თანამედროვე ეტიოლოგიური სტრუქტურის შესწავლა. ძირითად მასალად გამოყენებული იყო საერთო და ბავშვთა მოსახლეობის ინფექციური და პარაზიტული ავადობის წლიური და ყოველთვიური ანგარიშები (ფორმა №№1,2), წარმოდგენილი უკრაინის ოდესის ოლქის ლაბორატორიული ცენტრის მიერ 2015-2017 წწ.-ის მიხედვით – 6 ანგარიში და 4390 სტატისტიკური რუკა (ფორმა №066/ო) პაციენტებისა, რომელნიც 2015-2017 წწ. ჰოსპიტალიზებული და გაწერილი იქნენ ოდესის საქალაქო კლინიკური ინფექციური საავადმყოფოდან. როტა-, ნორო-, ადენო- და ასტროვირუსების ანტიგენების განსაზღვრისათვის ფეკალიების ნიმუშებში გამოყენებული იყო “ფარმასკოს” ფირმის (იტალია) ქრომატოგრაფიული ექსპრეს-ტესტები.

შეფასებულია დაავადებულთა ჰოსპიტალიზაციის სიხშირე სხვადასხვა ასაკობრივ ჯგუფში დარეგისტრირებული შემთხვევების გათვალისწინებით. გამოყოფილი 18 ბაქტერიული გამომწვევიდან ყველაზე ხშირი იყო: St. aureus, Kl. pneumoniae, Ps. aeruginosa, E. coli, Pr. vulgaris, Ent. cloacae. 2016-2017 წწ. შერეული დაინფიცირება დადგენილია ფეკალიების 54 სინჯში. ბაქტერიულ-ვირუსული ასოციაციები აღნიშნულია 20 სინჯში და წარმოადგენილია St. aureus-, Kl. pneumonia-, Ps. Aeruginosa- и Rotavirus-ით. გამოკვლეულია 2016

წლის ივნის-აგვისტოში სტაციონარულ მკურნალობაზე მყოფი მწვავე ნაწლავური ინფექციით მოზრდილი პაციენტების (ასაკი – 19-88 წელი) ფეკალიების 228 ნიმუშში. როტა-, ნორო- და ადენოვირუსების ანტიგენების გამოვლენის სიხშირემ მოზრდილ პაცინტებში 2016 წლის ზაფხულის პერიოდში შეადგინა 13,6%. გამოყოფილი როტავირუსების გენოტიპირების შედეგები წარმოდგენილია ოდესის ოლქის ვირუსოლოგიური ლაბორატორიის მიერ. 2016 წელს გამოვლენილი როტავირუსების გენოტიპირებით დადგენილია G1P[8] – 46,70% და G3P[8] – 26,70% გენოტიპების დომინირება.

მწვავე ნაწლავური ინფექციების ეპიდემიური პროცესის თანამედროვე თავისებურებას ოდესის ოლქში წარმოადგენს როგორც ვირუსული, ასევე, ბაქტერიული გამომწვევების და მათი უხვი კომბინაციების ფართო მრავალფეროვნება.

DEVELOPMENT AND ADAPTATION OF DIETARY ASSESSMENT TOOLS FOR ELDERLY IN GEORGIA

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The older population is the most rapidly growing sector of society worldwide and, according to experts' prognosis, in some developed countries elderly will outnumber younger people in the near future [7]. A similar tendency is observed in Georgia. However, little attention has been paid to nutrition assessment, including dietary aspects of the Georgian elderly population and this issue has not yet been studied. Decreased appetite, depression, cognitive impairment, polypharmacy, inadequate socioeconomic conditions, chewing and swallowing problems, loneliness are common potential nutritional risks for older people [2]. The maintenance of health, functional independence and quality of life in elderly requires adequate understanding of nutrition needs of older people [7]. According to ABCD approach [9], dietary assessment is an essential method for evaluating the individual and population's nutritional status in combination with anthropometric, laboratory, and clinical assessment.

For comprehensive dietary assessment of elderly is crucial correctly gathering of essential data, which requires the selection of the most appropriate/relevant questionnaires.

Thus, the aim of our study was to collate and analyze dietary assessment tools in order to adapt nutrition knowledge questionnaires for evaluation of the nutritional status of elderly population in Georgia.

Material and methods. "Compilation, development and adaptation of dietary assessment tools for elderly in Georgia" is the part of the research on the assessment of the nutritional status of practically healthy elderly people in Georgian population which was planned at the David Tvildiani Medical University, Tbilisi.

In our cross-sectional study we applied different dietary evaluation methods and characteristics. To choose an adapted version we have analyzed more than 150 questionnaires of 15 types (https://www.nutritools.org/tools) [5,9], by following 3 steps: 1. Diet questionnaires for general/common appointment; 2.among them we have separated questionnaires available in practice and relevant/valid to our research design (more than 100 questionnaires of 7 types), and finally, 3. diet questionnaires and screening tools special for elderly (more than 20 questionnaires of 4 types.). Therefore, we selected the following methods:

Methods

- Histories [3,9]. of study participants – reflecting: the health state (Health/Medical history), the social and economic situation/condition of the person (Social-economic history); information on the use of medicines (Drug/Medication history).

- Diet history [3,4,9] – gathered information on eating circumstances, nutritional habits, behavior, traditional pattern and food choice (e.g. favorite or disliked/hated food), also life style factors, especially physical activity in relation with nutrition.

-Food Frequency Questionnaire [5,11]. - before the start of the research were created a list o f foods and dishes that are traditionally used by the elderly in Georgia.

- Multiple pass 24-hour recall [6,13]– 4 times with a 2-3 day interval, in 4 nonconsecutive days including at least one weekend, using 5 distinct passes or 5 steps: step 1. "Quick list" – a list of foods and beverages consumed during the previous 24 hours is collected; step 2. "forgotten foods" – probes the foods possibly forgotten during previous step; step3. " time and occasion" for each food is collected; step 4. 'detail cycle" – detailed description, amount, and additions for each food is collected; step 5. "final probe" – probes for anything else consumed in the previous 24 hours.

The questionnaires (see also FFQ) were interviewer-administered, filled face to face, using a surrogate source (e.g. family member, relatives, carers) to verify information. Quantities of consumed foods were estimated by means of following tools: food models, pictures of foods, standard household measuring cups, spoons, etc.

- Mini Nutritional Assessment Short Form (MNA-SF) [2,10]. as Malnutrition risk Screening tool in elderly.

For final adaptation and testing purpose of selected and compiled/developed questionnaires we have used the study group formed for the nutritional status assessment in Georgian healthy elderly (Study group ≥ 60 y (n=75) - men (n=14) and women (n=61); Subgroup <75 y (n=64) - men (n=9) and women (n=55); Subgroup 75+ y (n=11) - men (n=5) and women (n=6)).

At the moment of the research start (2011) universal health care program did not work (http://www.euro.who.int/en/countries/georgia/news/news/2018/6/working-towards-universal-health-coverage-in-georgia) that's why we have proposed to the elderly from several organizations/unions to participate in the study. Based on preliminary data, more than 500 persons have been selected. Finally the research/study group has been developed using the exclusion criteria and people with follow-