

Inflammatory pathologies of genitalia in girls and adolescents

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Abstract

Background: Children and adolescents are a group of population that represents 1/3 of territorial population with specific biological peculiarities of age, activity, health and morbidity. Professional medical assistance given to the young generation ensures for subsequent generations a nice and healthy future.

Material and methods: The present study is non-experimental, of a descriptive type with a general group of 400 patients hospitalized during 2014 in the department of pediatric gynecology. Statistical processing was performed using the program «Epiinfo 2002» and the program «Microsoft Office Excel 2010».

Results: According to the obtained results within the study the inflammatory diseases of genitals were most frequently diagnosed – 263 cases (65.8±2.37%), the majority of which 254 (96.6±1.11%) of a non-specific genesis and 9 cases (3.4±1.11%) bacterial infections of specific genesis, $P<0.001$. In half of the investigated cases 108 (52.7±3.48%) there have been cultivated combinations of pathogens, the most frequently determined being: *E. coli+corinebacterium*, *E. coli+corinebacterium +Enterococcus faecalis*, or *Corinebacterium + St. Viridans*, *Streptococcus saprophyticus+corinebacterium*. From the total number of non-specific inflammatory diseases prevail inflammatory diseases of external and inferior internal genitals 169 (66.5±2.96%), $P<0.001$ – vulvovaginitis: acute vulvovaginitis, chronic relapsing vulvovaginitis with a maximum share in the age group 1-4 years old 68 (40.2±3.79%). Contrary to the distribution of inflammatory diseases of the inferior and external genital tract, the inflammatory diseases of the upper genitals increase with the advancement in age of the patients involved in the study with a maximum rate in the group of adolescents of 16-19 years old (55.4±5.47%), $P<0.001$.

Conclusions: An increase of the inflammatory processes of genitals in the age groups 1-4 (22.3%) and 16-19 (25.8%) was determined. A maximum share of inflammatory diseases of inferior genitals was determined in patients aged 1-7 and inflammatory diseases of the upper genital tract in the period of adolescence – 14-19 years old.

Key words: girls, adolescents, inflammatory process.

Introduction

Children are considered to be an investment of parents, a population of reproductive age, of the country in the future of the society. A good, satisfactory state of health of the girls and adolescents beginning with the antenatal period, maintained and consolidated in childhood and adolescence, constitutes an important resource for the health of future generations. The health of girls and adolescents should be one of the major concerns for policy makers because health insurance at this age is a guarantee of an acceptable level of health for generations to come [1,2,3]. Unfortunately, maintaining and strengthening the health of the general population, including girls and adolescents in the Republic of Moldova today is difficult due to the mass migration of the population, including the female population until adolescence; poor economic condition of the country and poor living conditions, especially in rural areas; low education level of the population. These factors influence the increase in infantile gynecological morbidity which largely affects their sexual development, their reproductive function and the decreasing of social activity [4]. According to some reports a decrease in the general health of girls during the last 10 years from 28.6 to 6.3% is observed [5].

The structure of gynecological morbidity in girls varies according to age and stages of their body development [6, 7]. If we analyse the distribution of gynecological diseases in the general structure of gynecological morbidity, then it can be observed that it does not vary in different regions

and countries of the world, the inflammatory diseases of the genitals having the highest frequency (65.8-63%).

The aim of the study: Evaluation of incidence and distribution of inflammatory diseases of genitals in girls and adolescents from the study in different life periods.

Objectives: 1. Determination of cardinal clinical symptoms of inflammatory diseases of genitals in patients from the study; 2. Evaluation of laboratory parameters, instrumental in patients with inflammatory diseases in the studied group; 3. Analysis of reference diagnostics, clinical admission and final diagnoses of the patients from the study; 4. Distribution of inflammatory diseases of genitals in patients from the study according to their age.

Material and methods

The present study is non-experimental, of a descriptive type with a general group of 400 patients hospitalized during 2014 in the department of pediatric gynecology of the National Institute of Mother and Child, Chisinau, the Republic of Moldova. Methods of data collection in the study were based on extraction of medical documentation data from archive to complete the questionnaire for research. Statistical processing was performed using the program “Epiinfo 2002” and the “Microsoft Office Excel 2010”.

Results and discussion

Analyzing the obtained data it was found that from the age of 3 weeks to 19 years old the average age of patients studied was 11.4 ± 1.26 years old (fig. 1).

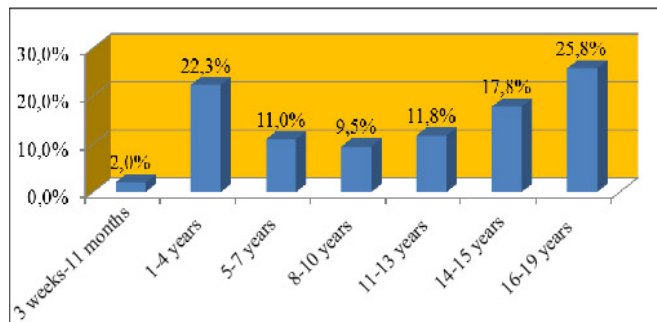


Fig. 1. Distribution of the patients in the study according to their age.

By place of residence 205 patients come from the urban area (51.3±2.49%) and 195 (48.7±2.49%) from rural area (table 1).

Table 1

Distribution of patients according the place of residence

No	Place of residence	Abs. n=400	P±ES (%)	t	P
1	Urban	205	51.3±2.49	0,7356	>0.05
2	Rural	195	48.7±2.49		

Performing a comparison between reference diagnostics and established diagnoses at admission it was found that in reference diagnostics of the patients in the hospital predominate the inflammatory pathologies of the genital organs 250 (62.5%): 244 (97.6%) non-specific inflammatory diseases and in 6 (2.4%) cases inflammation of the genitals of specific origin (urogenital mycoplasmosis, genital herpes, warts acuminata). From the total number (244) of clinical cases with non-specific inflammatory diseases 180 (73.8%) are attributed to inflammation of external and internal inferior genital organs (acute vulvovaginitis 98 (54.5%); recurrent vulvovaginitis 80 (44.4%); acute Bartholinitis 2(1.1%)), and 64 cases (26.2%) inflammatory pathologies of internal superior genital organs (acute salpingoophoritis 41 (64%), subacute salpingoophoritis 18 (28.2%), chronic recurrent salpingoophoritis 5 (7.8%). In diagnoses, established at admission, dominate the same categories of pathologies without major differences (table 2).

Table 2

Distribution of gynecological diseases according to reference and hospitalisation diagnoses

Gynecological maladies	Reference diagnostics n =400		Admission diagnostics n =400	
	Abs	P±ES	Abs	P±ES
Inflammatory pathologies of genital organs	250	62.5±2.41	251	62.7±2.41

After evaluating the clinical picture of inflammatory processes of genitalia in girls and adolescents there were highlighted most common symptoms: pain in 140 cases (35 ± 2.38%), P <0.001; pathological leucorrhoea in 210 cases (52.5 ± 2.49%), P <0.001; itching genitals – 102 cases (25.5 ± 2.18%), P <0.001. The extragenital complaints are attributed mainly to urinary tract damage, dysuria 19 (4.75±1.06%), P<0,001, fully associated with inflammatory diseases of the external genitalia.

Depending on the onset of the inflammatory process: acute onset / primary was determined in 239 cases (59.8 ± 2.45%), chronic evolution, relapsing diseases in 161 cases (40.2 ± 2.45%), p <0.001 (fig. 2).

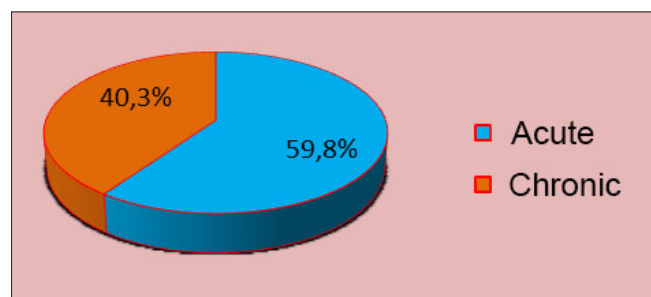


Fig. 2. Graphic representation of patients according to onset of disease.

Most patients in the study 264 (66.0 ± 2.36%) were hospitalized in satisfactory, at 121 patients (30.3 ± 2.29%) was established a state of medium severity and 15 patients (3.8 ± 0.95%) were hospitalized in serious condition.

On physical examination there was found hyperemia of vulvar mucosa in 260 cases (65.0 ± 2.38%). Vulva swelling was recorded in 234 cases (58.5 ± 2.46%), accompanying entirely the mucosal hyperemia, P <0.001. Purulent discharges from the genital tracts are found in 144 cases (36.0 ± 2.40%), bloody deletions in 72 cases (18.0 ± 1.92%) and only 3 cases (0.8 ± 0.44%) with cheesy discharges.

At gynecological examination of genitals (exam with specula; vagino-abdominal/recto-abdominal exam; vaginoscopy) performed in 154 cases (73.3 ± 3.05%) there were determined modifications, P <0.001, of which on the first place is: sensitive annexes in 127 cases (59.6%), hypoplastic uterus was found in 1 case (7.8%), ovarian enlargement in size in 13 cases (8.4%), the presence of the foreign body in the vagina and hypoplastic ovaries were determined in 2 cases (0.9%), rudimentary uterus in one case (0.5%).

The patients in the study who were hospitalized in the department of pediatric gynecology had undergone a set of laboratory investigations. Leukocytosis with a drift to the left has been detected in 75 cases (18.8±1.95%), identified in patients with acute inflammatory process (acute salpingoophoritis, subacute salpingoophoritis, chronic recurrent salpingoophoritis) of the superior genitalia – 34 (45.3±5.75%), leukocytosis less characteristic for the lower genital inflammation – 12 (16.0±4.23%), in 10 cases

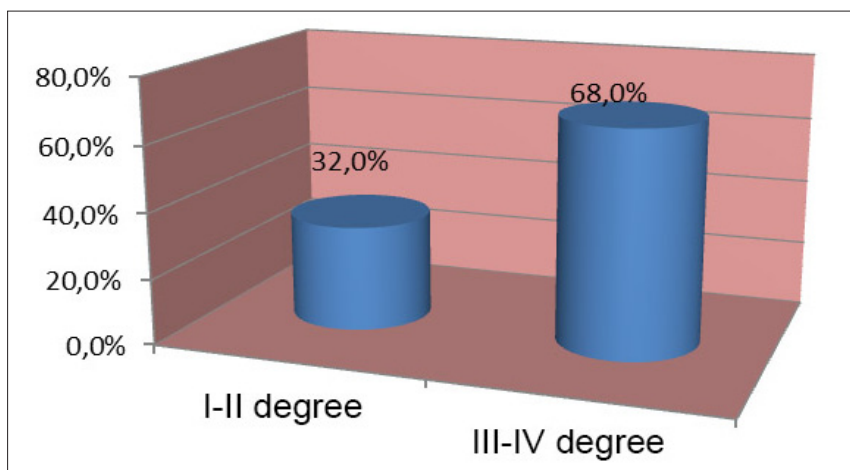


Fig. 3. Results of bacterioscopic exam in patients of the study.

(13.3±3.92%) leukocytosis was identified in patients with other complications (foreign bodies 3; trauma of genitalia 1; ovarian cysts 6).

It should be mentioned that leukocytosis is not a specific criterion only for inflammatory diseases of genitalia because the rest of the patients 19 (25.3±5.01) with leukocytosis within the study had other sources of bacterial infections in the body 7 (36.8%) or formed a combination with inflammatory diseases of genitalia 12 (63.2%) (e. g. vulvovaginitis + acute cystitis; vulvovaginitis + chronic recurrent/acute pielonefritis; inflammatory diseases of the annexes of uterus + chronic/acute pielonefritis, chronic cystitis; inflammatory diseases of external/internal superior genitalia associated with bacterial infections of upper respiratory tract). Eosinophils increase in the general analysis of blood marks the girls' contact with various parasites (ascariasis, toxocarasis, giardiasis, lamblia, etc).

Bacterioscopic exam results indicate the presence of inflammatory process of genitals (purity grade III-IV) in 272 patients (68.0 ± 2.33%) in the study group, $P < 0.001$ (fig. 3).

The bacterioscopic exam (table 3) was followed by bacteriologic investigations in 205 cases (75.4±2.60%), biological material was taken from the vagina 191 (97.5±0.78%), vulva 6 (2.0±0.70%), urine 3 (0.5±0.35%). In half of the investigated cases 108 (52.7±3.48%) were cultured combinations of pathogens, the most frequently determined were: *E.coli+corinebacterium*, *E.coli+corinebacterium+Enterococcus faecalis*, or *Corinebacterium + St. Viridans*, *Streptococcus saprophyticus+corinebacterium*. Below in table 3 the rate of pathogens according to their detection in patients is presented. Thus, the most frequent increase is attributed to optional microbes: *Corynebacterium spp.* 96 (46.8%), followed by *E.coli* 63 (30.5%), *Enterococcus faecalis* 50 (24.4%), *Stafilococcus aureus* 20 (9.8%), *Str. viridans* 17 (8.3%), *Str. saprophyticus* 15 (7.3%), *Staph. epidermidis* 14 (6.8%), *Klebsiella pneumoniae* 12 (5.9%), etc. It is to be mentioned that an increase of the anaerobic agents,

known as the most aggressive, was not found in patients who undertook the bacteriological exam. Rarely detected were: *Proteus vulgaris* 1 (0.5%); *Proteus mirabilis* 3 (1.5%); *Ps. Aerogenosa* 3 (1.5%), *Hemophilus influenzae* 2 (1%), *Gardenerlla vaginalis* 2 (1%), *Klebsiella oxytoca* 7(3.4%), *Candida glabrata* 1 (0.5%), *Candida krusei* 1 (0.5%).

Serological exams with the purpose to determine the infections and their evolution were carried out in 121 patients (30.3±2.29%). Immune antibodies (IgA, IgM, IgG) were identified in 48 cases (39.7±4.44%): *Mycoplasma hominis* 30 (62.5±6.98%) (in 28 cases there was determined a chronic infection, Ig G being detected in 2 cases – recent infection marked by positive titres of IgM and IgA); *Ureaplasma urealiticum* 17 (35.4±6.90%) (chronic infection in 14 cases, marked by positive titres IgG and 2 cases of fresh infection, marked by the presence of IgM; IgA); *Ascaris lumbricoides* detected in 17(14.6±5.09%) (6 patients with a history of infection, marked only by titres IgG and 1 case with a recent infection with positive IgA titres); chronic

Table 3

Ranking of pathogens within the bacteriological exam in patients from the study

No	Pathogens	N=205	P (%)
1	Corynebacterium	96	46.8
2	E. Coli	63	30.5
3	Enterococcus faecalis	50	24.4
4	Stafilococcus aureus	20	9.8
5	Streptococcus viridans	17	8.3
6	Streptococcus saprophyticus	15	7.3
7	Klepsiella pneumonia	12	5.9
8	Staphylococcus epidermitis	14	6.8
9	Candida albicans	9	4.4
10	Streptococcus β-hemolitic	7	3.4

infection with *Clamidia trachomatis* 3 (6.3±3.50%) (Positive IgG titres); *Toxocara catis/canis* 4 (8.3±3.98%) (3 cases of chronic infection – IgG and 1 case of acute infection, marked by positive IgA); *Giardia lamblia* 4 (8.3±3.98%) (in 3 cases chronic parasitosis/IgG “+” and 1 case of acute infection/IgA “+”).

Thus, the laboratory serological results allowed us to find out the contact of the patients with the above mentioned pathogens which can be the cause of the development of the inflammatory diseases of the upper internal genitalia as well as the external genitalia in case of parasitic diseases. It was not possible to determine this «link» in patients from the study because of dispersing/discordance of the obtained results in analysis and interpretation of the laboratory parametres mentioned above.

Full assessment, full division and ranking of gynecological diseases; division and distribution of gynecological diseases according to the age of girls and adolescents in the study group was performed after an analysis of conclusive clinical diagnostics at discharging patients from the hospital.

The first place in the ranking of gynecological diseases in girls and adolescents in the study was attributed to inflammatory pathologies of genitalia, diagnosed in 263 cases (65.8±2.37%): the majority 254 (96.6±1.11%) of a non-specific genesis and 9 (3.4±1.11%) bacterial infections of specific genesis (8 urogenital mycoplasmosis, 1 urogenital ureoplasmosis), P<0.001. From the total number of non-specific inflammatory diseases the inflammatory diseases of external and internal inferior genitalia prevail 169 (66.5±2.96%), P<0.001 – vulvovaginitis: acute vulvovaginitis 135 (79.9±3.08%); chronic relapsing vulvovaginitis 33 (19.5±3.04%); acute bartholinitis 1(0.6±0.59%). Non-specific inflammatory diseases of the upper internal genitalia were diagnosed in 183 patients (32.7±2.94%), found

as salpingoophorites in various phases of evolution: acute salpingoophoritis 68 (81.9±4.22%), subacute salpingoophoritis 11 (13.3±3.72%), chronic relapsing salpingoophoritis 4 (4.8±2.34%) (table 4).

Table 4

General division of gynecological diseases in patients from the study

Gynecological diseases	Clinical diagnostics n=400		Dignostics at hospitaliaza-tion n=400		t	P
	Abs	P±ES	Abs	P±ES		
Inflammatory pathologies of genitalia	263	65.8±2.37	251	62.7±2.41	0.9198	>0.05

Another aspect which we had proposed ourselves to analyse was the general and separate distribution of various gynecological diseases mentioned above in different age groups. The analysis of the group of inflammatory diseases of genitalia (fig. 4) showed the predomination of non-specific inflammatory pathologies of external and inferior internal genitalia in age categories between 1-4 years old 68 (40.2±3.79%), P<0.001, with a diminishing rate when the girls advance in age. Thus, according to the graphic representation below, an obvious decrease in the rate of inflammatory diseases of external and inferior internal genitalia from 5 to 15 years old is observed, with a tendency to increase inflammatory processes in late adolescence 16-19 years old (5.3±1.73%), P>0.05. On the contrary, the distribution of inflammatory diseases of lower and external genital tract, inflammatory diseases of the upper genitalia increase with the age of the patients involved in the study, with the maximum rate in the group of 16-19 years old 46 (55.4±5.47%), P<0.001.

Following the presentation of data on distribution of

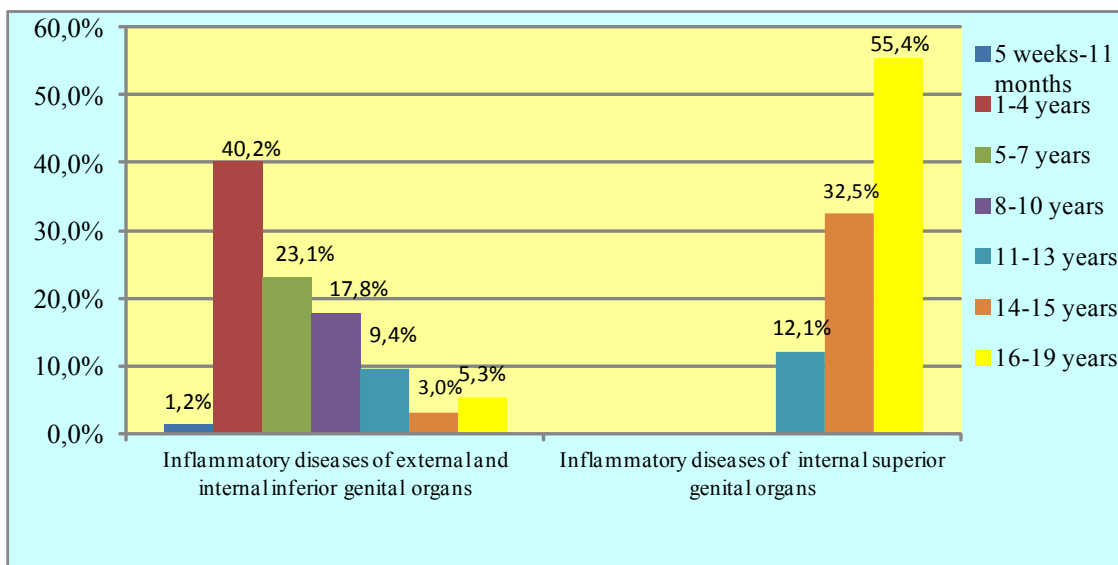


Fig. 4. Division of inflammatory diseases of genitalia in age groups.

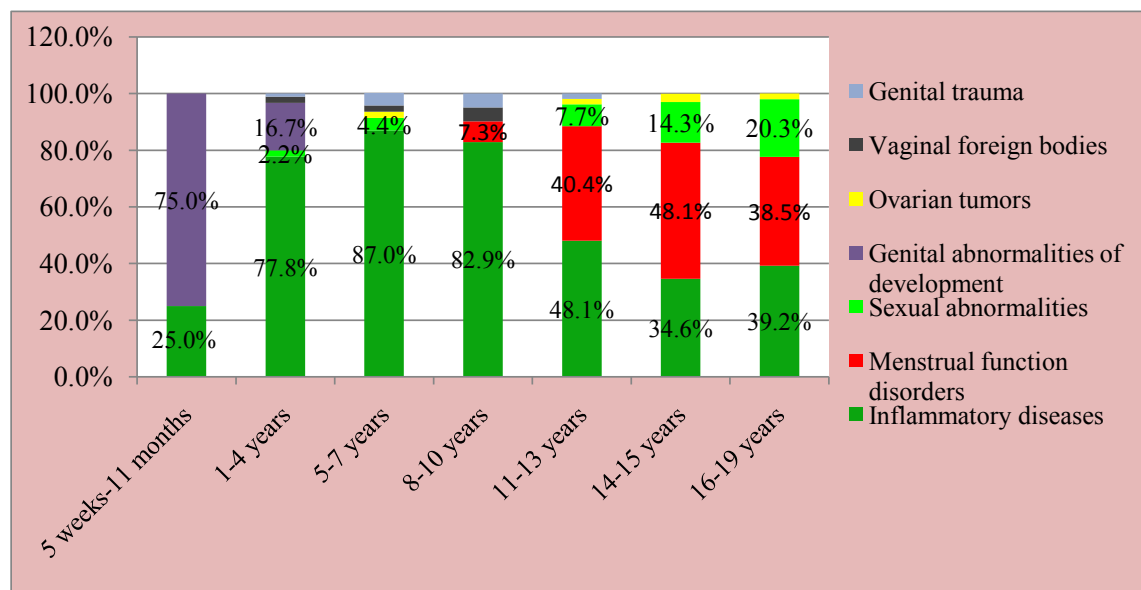


Fig. 5. Distribution and classification of gynecological diseases in various age groups.

inflammatory diseases of the genital organs, it can be concluded that vulvovaginitis occurs frequently during 1-4 years old, explained by poor hygiene in this group, helminthiasis was determined only in this age group, peculiarities of the female gonadostat functioning at this age [8,9]. Other causes cannot be mentioned because of the lack of data in the studied medical documents. Surprising were the results of determining an increased rate of inflammatory diseases of the upper genital tract in adolescents although there was no evidence, facts in medical records that would reveal the cause of their appearance (e.g. sexually transmitted diseases, manipulations of genitalia, presence of other extragenital outbreaks of infection) [7,10].

Thus, in the group of girls at the age between 5 weeks and 11 months predominated anomalies of external genital organs (labial agglutination) 6 (75±15.30%) and only in 2 cases (25±15.30%) – vulvovaginitis.

Graphic representation of gynecological diseases in patients of the age group 1-4 years old demonstrates an increased frequency of inflammatory diseases of external and internal genital organs – vulvovaginitis 70 (77.8±4.38%); in 68 cases (97.1%) and 2 (2.9%) cases of specific inflammations (mycoplasmosis and chronic urogenital ureoplasmosis), followed by anomalies of genital organs – synechiae of pudental labia 15 cases (16,7±3.93%). Other gynecological diseases in the group 1-4 years old were distributed in the following way: trauma of the external genitalia 1 (1.1%), abnormalities of sexual development 2 (2.2±1.54%) presented by early telarche and virile syndrome; foreign bodies in vagina 2 (2.2±1.54%).

The period of life aged 5-7 years old is represented by inflammatory pathology of genital organs 40 (87±7.22%). The rest of gynecological pathologies in this group is attributed to the trauma of external genital organs 2 (4.3±2.99%); abnormalities of sexual development 2 (4.3±2.99%), mani-

festated by early telarche and virile syndrome of an unknown etiology; isolated cases of foreign body (2.2±2.15%) and ovarian cyst (2.2±2.15%).

In the age group 8-10 years old the inflammatory pathologies of genitals remain in the top 34 diseases (89.5 ± 5.96%) with predominance of non-specific inflammations of the external and inferior internal genitalia 30 (88.2%) compared with inflammatory diseases of specific origin 4 (11.8%). Other diseases in this group are uterine bleeding (dysfunctional bleeding) 3 (7.9%) in patients with early menarche; complications connected with foreign bodies 2 (5.3%) and traumas of the external genitalia 2 (5.3%).

The pathologies specific to patients aged 11-13 do not change their status, inflammatory pathologies of genitalia being on the first place 25 (48.1±6.92 %) with predominance of the inflammation of the lower genital tract – vulvovaginitis 15 (60%) and 10 cases (40%) of inflammation of the upper genital tract which occurred primarily in the structure of inflammatory diseases in this age group.

During middle adolescence of 14-15 years old the inflammatory pathology of genitals is followed by menstrual dysfunction within the ranking of this group 36 (35.5±4.69%), with predominance of inflammation of upper internal genitalia 27 (75%) and there was determined a clear decrease of the inflammation of inferior genitalia 5 (13.9%).

Almost equally are distributed the groups of inflammatory diseases of the genitals 57 (38.5±4.08%) and diseases accompanied by disorders of the menstrual function 58 (39.2±4.09%) in adolescents of 16-19 years old. The structure of the inflammatory infections is constituted of the maximum rate of the inflammatory diseases of the upper genital tract 46 (80.7%), with a decrease of inflammatory diseases of the inferior genital tract 9 (15.8%) (fig. 5).

Thus, the analysis of clinical diagnostics of distribution

of gynecological diseases according to age and the general distribution of gynecological diseases gives us the possibility to create a structure of gynecological morbidity in the framework of the present study. The structure and ranking of gynecological diseases is constituted of inflammatory diseases of genital organs, diseases accompanied by menstrual disfunction, abnormalities of sexual development, anomalies of genitals and tumors of the genitals. The represented structure is similar to the structure of gynecological morbidity in different countries inclusively the Republic of Moldova [3,11,12].

Conclusions

1. The inflammatory pathology of genitals occupies the main place ($65.8 \pm 2.37\%$) in the structure of gynecological morbidity in patients from the study;

2. The following is informative for the diagnosis of inflammatory diseases of genitals: bacterioscopic and bacteriologic examination of samplings from genitals, the vulvar prints; vaginoscopy; the coprologic examination to helminths; serological examination to various parasites and specific infections;

3. Pain ($35 \pm 2.38\%$); pathological leucorea ($52.5 \pm 2.49\%$); genitals itching ($25.5 \pm 2.18\%$) and disurea 19 ($4.75\% \pm 1.06\%$) constituted the clinical picture with the most frequent symptoms observed in patients of the studied group;

4. There was determined an increase of the inflammatory processes of genitals in the age groups 1-4 (22.3%) and 16-19 (25.8%);

5. As the most frequent etiological factors in the non-specific inflammatory processes in the majority of age groups there were determined facultative microbes: *Corynebacterium spp.* 96 (46.8); *E.coli* 63 (30.5%); *Enterococcus faecalis* 50 (24.4%); *Stafilococcus aureus* 20 (9.8%); *Str. viridans* 17 (8.3%); *Str. saprofiticus* 15 (7.3%);

6. A maximum share of the inflammatory diseases of the inferior genitals was determined in patients at the age between 1-7 years old and the inflammatory diseases of the genital tract in the period of adolescence 14-19 years old.

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