III. PEDIATRICS

STUDY ON ACUTE LYMPHADENITIS IN CHILDREN

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Abstract

In this study, we followed the clinical and paraclinical manifestations of the acute adenitis in children, taking into consideration that they represent the most frequent cause of acute lymphadenitis during childhood. The infectious adenitis represented the most frequent cause of increasing lymphatic ganglions in children, being present in 694 cases (62.4%). Pyogenic adenitis mostly affected small children (37.1%), the frequency gradually decreasing towards the older child. The pyogenic adenitis appears most frequently after a recent regional infection (89%) in the drainage area of the affected lymphatic ganglions. The most frequent localization of the pyogenic adenitis was at the level of cervical (63.3%) and submandibular regions (21.1%). The pharynx infections were the most frequent (37%), followed by the cutaneous ones (29%).

Key words: Pyogenic adenitis, etiology, frequency, children.

Introduction

Pyogenic adenitis is a localized adenitis, determined by microbial agents which may primitively affect the ganglion or may accompany a regional infection, being a satellite to the infectious processes which are found in the corresponding drainage area.

Microbial adenopathies with common germs often accompany a rhynopharinx infection. The adenopathy may be unilateral or bilateral, painful, surrounded by a moderate periadenitis, without the modification of adjacent teguments. After the pathogen agent penetrates the lymphatic ganglion, the polimorphonuclear cells increase in number and the suppuration occurs. Without treatment, it can evolve to adenophlegmon.

Material and method

We carried out a retrospective study in 313 patients with acute lymphadenitis, aged between 2 weeks and 16 years, who were admitted in the Pediatric Clinics of the Emergency County Hospital in Craiova, from 1996 to 2005.

For this group, we followed: pyogenic adenitis frequency; case distribution according to age groups, sex and environment; anamnesis particularities related to onset; local and general clinical examination; careful clinical examination of the drainage areas in the affected ganglionary area; correlation between the type of infection and the localization of the adenopathy; specific (cultures from the ganglionary product and from other pathologic products) and unspecific paraclinical examinations (neutrophylic leukocytosis, acute phase reactants).

Results and discussions

Within an ampler study, carried out over a period of 10 years, on a group of 1112 children with lymphadenitis, the infectious adenopathies represented the most frequent cause of increasing lymphatic ganglions in children, being present in 694 cases (62.4%). Bacterial etiology was found in 324 cases (46.6%), viral in 255 cases (36.7%), mycobacterial in 99 cases (14.2%), parasitary (toxoplasmosis) in 16 cases (2.3%). We did not register cases of adenopathy caused by fungi (Table 1).

Table 1. Infectious causes of adenopathy (N = 694)

Infectious Causes of adenopathy		No.	%
Bacterial (N=324)	Pyogenic adenitis	313	45.1
	Cat's scratch disease	11	1.5
Viral (N=255)	HIV Infection	184	26.5
	Infectious Mononucleosis	36	5.2
	Rubella	28	4
	Measles	4	0.6
	CMV Infection	3	0.4
Mycobacteria (N=99)	Tuberculous adenitis	87	12.5
	Adenitis with atypical mycobacteria	12	1.7
Parasitary (N=16)	Toxoplasmosis	16	2.3
Fungi (N=0)	Hystoplasmosis, Aspergillosis	0	0
Total	Infectious adenopathies	694	100

In our study, the pyogenic adenitis represented the most frequent cause of acute adenitis (45.1%) within infectious adenitis.

The group characteristics related to age, sex, and environment are given in table 2.

Table 2. Characteristics of the group with pyogenic adenitis (N = 313).

Age group			Sex				Environment			
			male		female		urban		rural	
	No.	%	No.	%	No.	%	No.	%	No.	%
0 – 1year	51	16.3	40	12.8	11	3.5	13	4.2	38	12.1
1 - 3 years	116	37.1	64	20.4	52	16.6	55	17.6	61	19.5
3 - 6 years	71	22.6	47	15	24	7.6	27	8.6	44	14.1
6 - 10 years	49	15.6	28	8.9	21	6.7	23	7.3	26	8.3
10 - 16 years	26	8.3	18	5.8	8	2.5	11	3.5	15	4.8
Total	313	100	197	62.9	116	36.9	129	41.2	184	58.8

Taking into account the case distribution according to age groups, we can notice that pyogenic adenitises mostly affects infants (37.1%), the frequency gradually decreasing with toddlers. For the 0-3 year age group, immunity is low, and the frequency of the respiratory and cutaneous infections is high. We found pyogenic adenitis in 6 cases for the new-born (2%), while for the infant, in 45 cases (14.3%).

The case distribution according to sex emphasizes a clear dominance of males with 197 cases (62.9%), as compared to 116 cases of females (36.9%); from the environment point of view, we notice an increased frequency of children coming from rural areas - 184 cases (58.8%), as compared to urban areas with 129 cases (41.2%).

The adenopathy onset was acute, 1-3 weeks before the hospitalization.

The clinical characteristics of the affected ganglions were: the ganglions diameter was between 2 and 6 cm; they were spontaneously painful or when touching them; they had a hard, fluctuant consistency which was present in 1/3 of the cases; they were adherent to deep planes; modified adjacent teguments (local fever, erythema, edema). The adenitis evolution to suppuration was recorded in 58 cases (18.5%) which required incision and surgical drainage.

The pyogenic adenitis appears most frequently after a recent regional infection, in the drainage area of the affected lymphatic ganglions.

In most cases - 279 cases (89%), we have found out various locoregional infections, after a thorough examination.

The pharynx infections were the most frequent, in 116 cases (37%), followed by the cutaneous ones - 91 cases (29%), infections of the oral cavity - 39 cases (12.5%), otic infections - 17 cases (5.4%), conjunctival infections - 16 cases (5.1%); the infection center was not obvious the moment when the adenitis was diagnosed in 34 cases (11%). (Table 3).

Table 3. Infection localization in pyogenic adenitis (N=313)

Infection localization	Number	%
Amygdalian	116	37
Cutaneous	91	29
Oral cavity	39	12.5
Otic	17	5.4
Conjunctival	16	5.1
Without specified infections	34	11
Total	313	100

A correlation between adenitis localization and regional infections in the afferent drainage area is shown in table 4.

The pharynx infections were present in 116 cases (41.5%), being accompanied by laterocervical adenitis in 96 cases (34.4%) and submaxillary and submentonier adenitis in 20 cases (7.1%)

Cutaneous infections in the drainage area of the affected ganglions were registered in 91 children (32.6%). Infections of the hairy skin of the head (seborrheic dermatitis, impetigo, and pediculosis) were present in 61 children (21.8%). These infections determined the appearance of satellite adenitis, with a laterocervical, occipital, retroauricular localization. Acute piodermitis was found in 20 children (7.1%), especially in sucklings, being accompanied by laterocervical, axillary and inguinal adenopathy. We registered infected wounds at the upper limb level accompanied by axillary adenitis in 6 children (2.1%), while at the lower limb level accompanied by inguinal adenitis in 4 children (1.4%).

Infections of the oral cavity were registered in 39 children (13.9%) - 21 children (7.5%) showed signs of gingivostomatitis, and 18 children (6.4%) dental abscess. These infections led to the appearance of submandibular, submentonier and laterocervical adenopathies.

Otitis externa was found in 17 children (6.1%), being accompanied by laterocervical and retroauricular adenopathy, while conjunctivitis, accompanied by preauricular adenopathy was registered in 16 children (5.7%).

Table 4.Correlation between pyogenic adenitis localization and infection type (N=279).

Localization of adenitis	Type of infection	No.	%
Cervical	Regional cutaneous infections (of the head and neck)	61	21.8
	Pharyngoamigdalitis	96	34.4
	Acute piodermitis	20	7.1
Submaxillary and submentonier	Dental infections	18	6.4
	Gingivostomatitis	21	7.5
	Pharyngoamigdalitis	20	7.1
Preauricular	Conjunctivitis	16	5.7
	Otitis externa	17	6.1
Axillary	Cutaneous lesions of the upper limb	6	2.1
	Acute piodermitis	20	7.1
Inguinal	Cutaneous lesions of the lower limb	4	1.4
	Acute piodermitis	20	7.1

Among the paraclinical investigations, in order to set the diagnostic, the cultures from the ganglionary product, the infected cutaneous lesions and the pharynx exudate were most edifying. The presence of the leukocytosis with neutrophily and of the acute phase reactants held an unspecific, but helpful role.

The cultures from the ganglionary product were performed in 58 cases (18.5%) and they were positive for:
- staphylococcus aureus in 28 cases (9%);
- streptococcus β-hemolytic in 14 cases (4.5%);
- streptococcus group B in 4 cases (1.2%);
- anaerobic germs in 12 cases (3.8%).

The cultures from the pharynx exudate revealed the presence of the streptococcus β-hemolytic in 24 cases (7.6%) and of the staphylococcus aureus in 16 cases (5.1%); the cultures from the overinfected cutaneous lesions were positive for the staphylococcus aureus in 18 cases (5.7%).

Leukocytosis was present in 286 cases (91.3%), with values between 10,000-25,000/mm^3, while neutrophily with values over 60% was present in all children.

Among the acute phase reactants, the ESR with values between > 30mm/hour was present in 243 children (77.6%), the reactive C protein was present in 86 children (27.5%), the fibrinogen with values over 400 mg% was present in 226 children (72.2%), while α_2 globulins with values > 8% were present in 48 children (15.3%).

The moderate anemia with Hb values between 9 and 11 gr % was found in 87 children (27.7%).

The laboratory findings are shown in table 5.

Ganglionary biopsy was performed in 36 children (11.5%) where the bacterial etiology was not obvious after the clinical exam and the usual paraclinical investigations. In these children, the hystopathological exam emphasized a lymphocytary, reticular, plasmocitary cell hyperplasia, with big, basophile cells. Both these cells and the polimorphonuclear ones showed major dystrophic phenomena.

Cenghiz (2004), in a study carried out on a group of 132 children aged between 2 and 15 years, noticed that pyogenic adenitises were most frequently localized at the level of the cervical region (43.2%) and submandibular (27.3%), while the cultures were positive in 23.5% of the studied cases.

Kelly (1998) specified that infections with staphylococcus and streptococcus are most frequently found in children aged between 1 and 4 years.

Maureen (2002) noticed that 85% of the pyogenic adenitis cases have as etiology the infection with staphylococcus aureus or streptococcus β-hemolytic group A. Kelly (1998) pointed out the presence of the anaerobic bacteria in 38% of the cultures performed in cervical adenitis, in children aged between 2-16 years.

Kelly (1998) presented the following distribution of bacterial adenitis, according to localization: submandibular 50 - 60%; upper cervical 25 - 30%; submentonier 5 - 8%; occipital 3 - 5%; lower cervical 2 - 5%.

Other causes of pyogenic adenitis may also be represented by: *H influenzae, Pseudomonas aeruginosa, Yersinia pestis, Chlamydia, Mycoplasma pneumoniae, Treponema pallidum.*

When etiology is not obvious, one may occasionally require ganglionary biopsy. From the gathered product, one can make cultures for pyogenic germs, mycobacteria, and sometimes PCR.

In patients with fluctuant lymphatic ganglions, with a suspicion of abscess formation, the ganglionary x ray can bring additional data.

In adenophlegmon, the fine needle aspiration can be performed in order to point out the germs, although in these situations, we usually need an incision and the surgical drainage.

Table 5. Paraclinical explorations in pyogenic adenitis (N=313).

Paraclinical explorations	Results	No	%
Leukocytosis	10,000 – 25,000/mm^3	286	91.3
Neutrophily	> 60 %	313	100
ESR	> 30 mm at 1h	243	77.6
Protein C reactive	present	86	27.5
Fibrinogen	> 400 mg%	226	72.2
α_2 globulin	> 8%	48	15.3
Positive cultures from the ganglionary aspirate	- staphylococcus aureus - streptococcus β-hem. - anaerobic germs - streptococcus group B	28 14 12 4	9 4.5 3.8 1.2
Positive cultures from the pharynx exudate	- streptococcus β-hem. - staphylococcus aureus	24 16	7.6 5.1
Positive cultures in cutaneous lesions	- staphylococcus aureus	18	5.7
Ganglionary biopsy	Characteristic modifications	36	11.5

Conclusions

1. Pyogenic adenitis represented the most frequent cause of acute adenitis (45.1%) within the infectious adenitis.
2. Pyogenic adenitis mostly affected small children (37.1%), the frequency gradually decreasing towards the older child.
3. In most cases - 279 (89%) – after a thorough examination, we discovered various locoregional infections; we mainly found pharynx infections in 116 cases (37%)
4. The most frequent localization of the pyogenic adenitis was at the level of cervical (63.3%) and submandibular regions (21.1%).
5. Bacterial etiology was confirmed through cultures from ganglionary product in 18.5% cases, staphylococcus aureus (9%) and streptococcus β hemolytic group A (4.5%) being most frequently isolated.

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