

## DIAGNOSIS OF TUBERCULOSIS ADENITIS IN CHILDREN

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### Abstract

In the last decade, tuberculosis has become a major health problem, due to the increase of the disease frequency, both in adults and in children. Tuberculosis adenitis diagnosis was made according to the clinical and paraclinical manifestations and it was confirmed by a histopathological exam or cultures for *Mycobacterium tuberculosis*. Tuberculosis adenitis was a frequently encountered adenopathy (87 cases), representing 7.8% of all the adenopathies under study and 12.5% of the infectious adenitis. TB adenitis was found in all the age groups, with a higher frequency at the 10-16 years group (39.1%). The most frequent localization of adenopathy was anterior cervical in 43 children (49.4%). In 6 children (7%), the evolution was towards opening the abscess and fistulization. Diagnosis was set according to the following criteria: positive cutaneous test at tuberculin (87.3%), notion of TB contact (82.7%), ganglionic biopsy (64.4%) and the presence of the characteristic changes on the pulmonary x ray (21.8%).

**Key words:** Tuberculosis adenitis, diagnosis, children.

### Introduction

Tuberculosis adenitis is a disorder which was known ever since antiquity under the name of “scrofula”, a term which comes from Latin and was used for the tuberculosis infection of the lymphatic ganglions in the cervical region. The first record of this disease dates from

400 BC, when Herodotus suggested that persons suffering from it should be isolated (Lewis, 2003).

### Material and method

The group of the children with superficial tuberculosis adenitis was made up of 87 cases admitted in the Infectious Disease Hospital in Craiova, between 1996 and 2005. Tuberculosis adenitis diagnosis was made according to the clinical and paraclinical manifestations and it was confirmed by a histopathological exam or cultures for *Mycobacterium tuberculosis*, on a Löwenstein-Jensen environment. An important role for setting the diagnosis was given by the cutaneous test at tuberculin with 2 or 10 units, being considered positive when the local induration was more than 10 mm, and the anamnesis notion of TBC contact.

In studying the group, we looked for: the reported frequency for the rest of adenopathies; particularities related to anamnesis; case distribution according to age groups, sex, origin; local and general clinical exam; specific (PPD test, pulmonary x ray, ganglionic biopsy, cultures) and unspecific paraclinical examinations (ESR, leukocytosis, lymphocytosis).

### Results

Tuberculosis adenitis held an important place in the studied case-book record (87 cases), representing 7.8% of all the adenopathies under study and 12.5% of the infectious adenitis. The frequency of infection with *M. tuberculosis* as reported to all the infections with microbacteria was 87.8%, the rest of 12.2% being diagnosed as infections with atypical microbacteria. (Table 1).

Table 1. Tuberculosis adenitis frequency.

Type of adenopathy	No.	Tuberculosis adenitis (N=87)
Total adenopathies	1112	7.8%
Total infectious adenitis	694	12.5%
Total adenitis with microbacteria	99	87.8%

The increased frequency of the tuberculosis adenitis reflects a high incidence of the disease in our country. TB adenitis was found in almost all the age groups, with a higher frequency at the 10-16 years group (39.1%); during this period of life, there is a maximum receptivity to the disease, with a low natural resistance of the body.

The distribution of the cases according to sex reveals a slight predominance of females (51.6%), as compared to males (48.4%); according to environment, we have noticed a higher frequency for the children coming from rural areas (62%) as compared to those from the urban ones (38%).

The characteristics of the group according to age, sex, and environment are given in Table 2.

Table 2. Clinical characteristics of children with tuberculosis adenitis (N = 87).

Age group	Sex						Environment			
	Male		Female		Urban		Rural			
	No.	%	No.	%	No.	%	No.	%	No.	%
6 months-1year	4	4.6	3	3.4	1	1.1	2	2.3	2	2.3
1-3 years	14	16.1	6	7	8	9.2	5	5.7	9	10.3
3-6 years	13	15	6	7	7	8	6	7	7	8
6-10 years	22	25.2	10	11.5	12	13.8	7	8	15	17.3
10-16 years	34	39.1	17	19.5	17	19.5	13	15	21	24.1
Total	87	100	42	48.4	45	51.6	33	38	54	62

The incubation period of the disease, from the moment of infection until the clinical appearance of adenopathy, was difficult to tell.

In all cases, the major clinical sign which determined seeing the doctor was the occurrence of adenopathy. The period of time between the adenopathy

onset and the moment of going to the doctor varied between 15 days and 6 months (on average - 30 days).

The clinical characteristics, localization of adenopathy and the systemic signs associated to adenopathy are given in table 3.

Table 3. Localization of adenopathy and the association of systemic signs.

Localization of adenopathy	Present systemic signs		Absent systemic signs	
	No.	%	No.	%
<i>Cervical</i>	43	49.4	34	39.1
Submandibular	11	12.6	9	10.3
Submentonier	4	4.6	3	3.4
Supraclavicular	2	2.3	2	2.3
Axillary	6	7	4	4.6
Inguinal	5	5.7	2	2.3
Multiple	16	18.4	15	17.3
<b>Total</b>	87	100	69	79.3

The most frequent localization of adenopathy was anterior cervical in 43 children (49.4%), followed by a submandibular localization in 11 children (12.6%), submentonier in 4 children (4.6%), subclavicular in 2 children (2.3%), axillary in 6 children (7%) and inguinal in 5 children (5.7%). The multiple ganglionic affection was found in 16 children (18.4%).

The affected ganglions were moderately increased in volume, painless, of a firm/tough consistency.

In evolution, they increased their volume, becoming more or less coalescent and adherent to the neighboring plane. In 6 children (7%), the evolution was towards opening the abscess and fistulization.

The patients with tuberculous adenopathy are classically described, showing systemic clinical signs, such as: fever, weight loss, physical asthenia, nocturnal

perspiration. In our study, 69 children (79.3%) showed weight loss and tiredness, while in 18 children (20.7%) the adenopathy was not accompanied by signs of affecting the general state.

The primary pulmonary tuberculosis, which was radiologically confirmed, was present in 19 children (21.8%) with peripheral tuberculous adenitis: 12 children showed a primary complex, 4 children also had pleurisy, and 3 children had an infiltrated right upper lobe.

In all those children we noticed the presence of general signs (fever, asthenia, adynamy, weight loss, nocturnal perspiration) and of specifically pulmonary signs.

Among the biological investigations, the peripheral hematological examination revealed a moderate leukocytosis (8000 - 14000/mm<sup>3</sup>) in 24 children (27.6%), moderate lymphocytosis (40 - 60%) in 64 children (73.5%) and ESR >

30mm at 1h in 74 children (85%). Moderate anemia (Hb 8 - 11g%) was found in 48 children (55.2%).

The positive diagnosis was set according to the following criteria:

- positive results at the hystopathological examination of the affected lymphatic ganglions, in 56 cases (64.4%);
- positive cutaneous test at tuberculin in 76 cases (87.3%);
- abnormal pulmonary x ray in 19 cases (21.8%): hilary adenopathy in 12 cases (13.8%), concentration in the upper lobe in 3 cases (3.4%), pleurisy in 4 cases (4.6%);
- familial or close contact with an adult presenting active tuberculosis was admitted in 72 cases (82.7%);
- positive cultures for *Mycobacterium tuberculosis* coming from the gastric aspiration in 5 cases (5.7%).

**Discussions**

Tuberculosis represents the main cause of death in the world. Extra-pulmonary tuberculosis represents 1/3 of all cases of tuberculosis, children showing an increased predisposition to develop this kind of disease.

Superficial tuberculous adenitis represents the main manifestation within the extra-pulmonary tuberculosis, being the most frequent form of chronic cervical adenopathy

in children. The sucklings are more susceptible to severe forms of tuberculosis, with milliary tuberculosis prevalence; in preschool children there is a prevalence of superficial adenitis and tuberculous meningitis, while in school children the pleurisy and the bone tuberculosis.

In Romania, the tuberculosis incidence raised from 58.8/100.000 in 1985, to 141.3/100.000 in 2002 (4). In a study carried out by Didilescu and co. in 2002, 86.3% of the total localizations were pulmonary ones, 9.5% pleural and 4.2% extra-respiratory. According to the distribution on localization of extra-respiratory tuberculosis cases registered in Romania in 2002, we found out that tuberculous adenitis was present in 28.8% of the cases, followed by osteoarticular disorder 20.7%, meningoencephalitis 13.1%, disorders of urinary apparatus 9.7%, pericarditis 7.8%, digestive disorders 6.8%, nodose erythema 4.8%, genital 4.4% and ocular disorders 1.7%.

In our study, in most cases, the certainty diagnosis was established according to the hystopathological aspect which was characteristic to that of ganglionic biopsy, in correlation with the PPD cutaneous test, the notion of TB contact and the association of changes on the pulmonary x ray.

In table 4 there is a brief description of some clinical studies on tuberculous adenopathy.

Table 4. Clinical studies in literature regarding tuberculous adenopathy.

Authors	Place and date of activity	No. patients	Sex M/F	Average age	Systemic signs %	Associated Rx changes %	Positive PPD %
Polesky and co.	San Jose 2005	106	-	Children and adults	-	38	94
Jhaa and co.	India 1997 - 1998	60	1/1,3	9 months - 62 years (23 years)	18	16	95
Dandapat and co.	India 1987 - 1988	83	1/1,2	1 - 65 years (21 years)	85	35 (8% TB active)	74
Castro and co.	UCLA 1973 - 1983	23	1/1,3	2 -56 years (23 years)	16	18	100

Fine needle aspiration – FNA - was used in the last 10 years as an initial diagnose test, with few risks, being a less invasive procedure as compared to ganglionic biopsy and having better results (5,9). The tests were evaluated by means of a cytological microscopic examination, which revealed a resistance of bacilli to acids and alcohol; we also carried out culture for microbacteria.

The studies demonstrated that the role of FNA in diagnosing tuberculous adenitis is comparable to that of excision biopsy, FNA allowing the setting of the tuberculous etiology in 80-85% of the cases, through a cytological, microscopic and cultures examination (5,9,10).

FNA was not performed for our group of children – we preferred a ganglionic biopsy, because, in children, FNA can favor the appearance of fistulous courses.

Extra-pulmonary tuberculosis is often difficult to diagnose, due to the small number; the reduced increase rate of Koch bacillus in cultures limits its finding through conventional techniques.

In TB adenitis, the demonstration of the Koch bacillus existence on the smear or on the products which were obtained after a biopsy puncture can sometimes be uncertain. We recommend finding out the mycobacterial DNA by using PCR (8).

PCR (Polymerase Chain Reaction) is a DNA amplifying technique which uses specific DNA sequences as a marker for microorganisms. Theoretically, by using this method, we can detect even one microorganism from biological products, such as: sputum, gastric aspiration, pleural liquid or blood.

In adults, the sensitivity and specificity of the test is considered to be over 90% in detecting pulmonary tuberculosis. In children, the use of PCR for detecting *M. tuberculosis* has not been extensively evaluated yet.

In children, performing PCR is recommended in the following situations: in case of serious pulmonary disease; when the diagnosis is difficult to set on the basis of epidemiologic findings and the current laboratory investigations; for the evaluation of the children with pulmonary disease and for establishing the diagnosis of extra-pulmonary tuberculosis and immunosuppression.

Many recent studies used ELISA test for detecting the antibodies to various antigens of *M. tuberculosis* in children. The detection of the mycobacterial antigens (counting the tuberculostearic acid and the mycobacterium mycolic acid) was evaluated more in adults and less in children.

However, these diagnosis methods require special equipments which are still unavailable in countries where tuberculosis is frequent.

#### Conclusions

1. Tuberculous adenitis held an important place in the studied case-book record, representing 7.8% of all the adenopathies under study and 12.5% of the infectious adenitis which reflects the increased incidence of tuberculosis in children.
2. TB adenitis was found in all the age groups, but most frequent in teenagers (39.1%). The adenopathy with a cervical localization was most frequently found (49.4%), other localizations being submandibular and submentonier (17.2%), axillary (7%), inguinal (5.7%), supraclavicular (2.3%).
3. Diagnosis was set according to the following criteria: positive cutaneous test at tuberculin (87.3%), notion of TB contact (82.7%), ganglionic biopsy (64.4%) and the presence of the characteristic changes on the pulmonary x ray (21.8%).

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