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STANDARD TREATMENT EFFICACY AMONG CHILD'S PULMONARY TUBERCULOSIS

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Abstract: *Tuberculosis is known as one of the first 10 causes of death worldwide. Due to the high incidence of tuberculosis and the particularities of the caring of a child patient, is important to study the evolution of the children hospitalised and standard antituberculosis treated for different forms of tuberculosis, as well in the initial phase as in the continuing phase. Studying the results of treatment in TB patients could help both the public health professionals and the clinicians. The evolution to sechelae of stationary images may it be predictable especially in those cases of late diagnosis and treatment.*

Key words: *children, pulmonary tuberculosis, standard treatment*

1. Introduction

In Romania tuberculosis incidence has recorded an increase since 1986, then reached it's highest level of 142.6‰ in 2002 and slowly decreased in the next few years reaching in 2006 the level of 117.8‰. [10] Among children also the peak was recorded in 2002 – 48.2‰, then there was a decrease to 31.8‰ in 2006. Braşov is a traditional historic centre, a Transylvanian town cross-road placed, cross-road which carried out it's fame across the country and far more.

Old industrial centre, Braşov has been an attractive place for the population nearby and future generations kept it's connections with the laged ones. Children's tuberculosis sanatorium which later became a Pneumology Hospital has seniorrity and experience which has permitted itself by its placement, dope and personnel to carry and to treat children with tuberculosis from different towns of the country [4, 11].

2. Work hypothesis

Due to the high incidence of tuberculosis and the particularities of the caring of a child patient, the authors proposed themselves to study the evolution of the children admitted and treated for different forms of tuberculosis and who have benefited by standard antituberculosis treatment. We have considered that the antituberculosis medication given to the patients in standard treatment is efficiently as well in the initial phase as in the continuing phase of all types of tuberculosis included in the study.

We have evaluated the results depending of the duration, rhythm and the place of the

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treatment, following clinical and para-clinical criteria in dynamic as well during the admission as an outpatient, until the treatment was finished.

3. Material and methods

There were 306 cases studied and consisted of two batches of patients from different time periods:

- First period was 01.01.1990 – 31.12.1993, the study being retrospective and consisted of 174 cases;
- Second period was 01.01.2000 – 31.12.2003 which it is a prospective study including 132 cases.

Of the 306 cases, 170 cases belonging to both time periods received standard treatment. These patients were admitted to the paediatric ward of Pneumology Hospital Braşov, they have had ages between 2 months and 19 years and came from counties nearby Braşov such as: Covasna, Harghita, Mehedinţi and Alba where from, over 50 years, the virtue of the history, children with active tuberculosis have been treated. Patient's data were collected from the hospital charts, radiology bronchology, spirometry hospital registry, case reports charts to the ambulatory, treatment evaluation charts, ambulatory electronic database, charts of the hospital they were transferred from and the general practitioner's children registry.

Most of the children came from, at the moment of hospital admission, new or old tuberculosis focuses and they were detected through descendent epide-miological investigation and also through other hospital's paediatric wards, at the testing before entering a community or by the general practitioner. Children have had active tuberculosis, they were admitted to hospital and then they have bed taken in the evidence of the pneumologic ambu-latory and they were monitored until the end of entire treatment period. The evaluation of the efficacy of the standard treatment and the evolution of cases has been made depending of the place and treatment rhythm, duration of the consolidation period and the entire period of treatment duration.

4. Results and discussion

From all the 306 patients, 170 (55.5%) cases received standard treatment medication. Regarding the repartition on the two periods of time, more cases were registered among second period of time. After year 2000 when the treatment sheet was generalized and DOTS strategy had been adopted. Tuberculosis forms depending of the age group, radiologic dynamics, applied therapeutic schemes wear the imprint of the local medical conditions and of the endemy of those years. (Fig. 1)

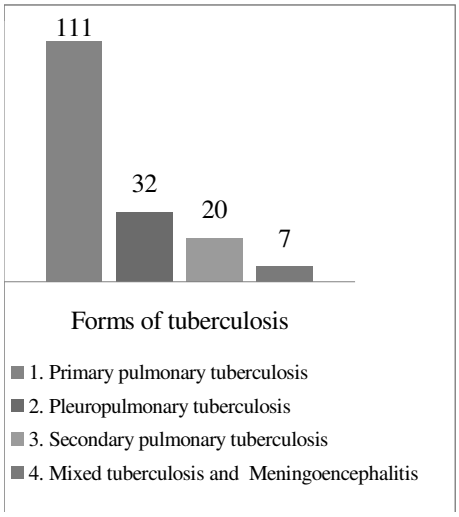

Fig. *1. Case repartition of the forms of tuberculosis among patients who received standard treatment.*

The forms of tuberculosis which have received standard treatment:

1.Primary pulmonary tuberculosis – 111 cases (65.29%):
   a. Primary benign (pb) - 104 cases

(61.18%)
   b. Primary granuly (pg) – 5 cases (2.94%)
   c. Primary cavern (cp) – 2 cases (1.18%)
2. Secondary pulmonary tuberculosis – 17 cases (10%):
   a. Pneumonia (pn) – 1 case (0.59%)
   b. Infiltrative ulcerated (iu) – 8 cases (4.71%)
   c. Infiltrative simple (is) – 2 cases (1.18%)
   d. Caseus cavitary (cc) – 6 cases (3.53%)
3. Pleuropulmonary tuberculosis – 33 cases (19.41%):
   a. Pleural simple (ps) – 28 cases (16.47%)
   b. Pleuropulmonary primary (pm) – 4 cases (2.35%)
   c. Pleuropulmonary secondary (pp) – 1 case (0.59%)
4. Extrapulmonary – 9 cases (5.29%):
   a. Meningoencefalitis (me) – 1 case (0.59%)
   b. Oculary (oc) – 1 case (0.59%)
   c. Mixed (mx) – 7 cases (4.12%)

Among primary tuberculosis of the pb group there were primary simple complex and benign complicated complex and a separate highlight group primary caverns – cp. In this group were dominating simple hilar adenopathy and the forms with perifocal congestion and perihilar disseminations. Malignant complicated primary complex includes: granuly and bronchopneumonia.

Pleuropulmonary tuberculosis consists of primary simple pleurisy – 85% and primary and secondary pleuropulmonary forms 15%, especially with numerous cases among primary tuberculosis combined with adenopathy, pneumonia and pleurisy.

In the secondary tuberculosis there are included post primary forms, primsecundary forms and secondary forms (infiltrative – nodular, ulcerated – cases and cavitary).

Extrapulmonary tuberculosis was represented by meningitis, ocular tuberculosis, mixed forms with simultaneous involvement: meningitis and pulmonary tuberculosis, peritonitis and pulmonary tuberculosis. Different forms of tuberculosis have influenced the duration of hospital admission. Large duration of 3.7 months in which children with primary tuberculosis have received hospital treatment may be justified by including granuly in this group.

Standard antituberculosis treatments that were applied are:
- I: 2HRZE(S)7/7+4HR7/7 or 3/7
- III: 2HRZ7/7+4HR7/7 or 3/7

The combinations which included etambutol – EMB were administered also to the children under age of 6 and the medical's ward experience did not revealed any adverse effects. Because the difference is made by the scheme from the initial phase of the treatment, HR combination has been administered to all 170 cases.

Third standard treatment has been administered in 61% of the cases (103 patients). Drug's doses were according to the literature:
- Isoniazid – HIN, has been administered in daily interrmitent doses of 5-10 mg/kg and 15 mg/kg/zi intermittent. There were administered tablets of 50 mg in which have been included also 5 mg of vit. B_6. For the mixed cases there were used injective solutions. For children of bigger age there were used 200 mg and 300 mg tablets.
- Rifampicin – RMP was used also as Rifadin syrup for children under age of 5 because it is easy to dose, it tastes good and capsules of 150 mg and 300 mg for bigger age. Administered dosage was 8-12 mg/kg daily and 15 mg/kg intermittent.
- Pyrazinamide – PMZ is 500 mg tablets

and administered dosage was 20-30 mg/kg daily and 40-50 mg/kg intermittent. For short periods of time and daily use were used also combinations such as HRZ.

- Ethambutol – EMB was used as well 400 mg tablets as 250 mg capsules and administered dosage was 15-25 mg/kg daily and 30-40 mg/kg intermittent. In some special cases there was a follow up of visual function made by the ophtalmologist.
- Streptomycin – SM administered dosage was 15-20 mg/kg daily and also intermittent.

The drugs were administered daily in the initial phase and intermittent in the continuing phase; considering that patients have had hospital admissions longer than 2 months it was easier to administer and follow daily administration of small doses and obvious well tolerated by the children. Sometimes the initial phase has had more than two months, especially extensive and complicated forms depending of clinical phenomena resolution, endoscopic or radiologic modifications at first check-ups.

We have considered having value in the following of the evolution the initial and end of treatment radiograph images. We weren't able to appreciate the evolution to a number of cases of 23 because the patient didn't came to the final evaluation or the final evaluation at the end of the treatment was made at other pneumology ambulatory. The appreciation of the lesion evolution has permitted the division into 4 radiologic groups:

- Partial resorbtion of the lesions – rp – 11 cases – 7%;
- Total resorbtion of the lesions – rt – 54 cases – 34%;
- Stationary images – st – 58 cases – 37%;
- Radiologic sechelae (persistent lesions tending to fibrosis) – se – 35 cases – 22%.

Among cases with standard treatment those with partial resorbtion of the lesions were almost equal to those with stationary images. Persistent lesions tending to fibrosis and sechelae were more dependent of the tuberculosis form than the hospital admission duration. Extensive forms and pleuropulmonary forms had the most stationary images.

The evolution to sechelae of stationary images may it be predictable especially in those cases of late diagnosis and treatment. Complicated primary complex primary tuberculosis forms have had slow radiologic involution especially children aged 1 to 5. Regarding the patients age groups we have observed that radiologic dynamics is slower amongs those with persistent radiologic signs and children aged 1 to 10. Among children with standard treatment whatever age they had, 49% have had resorbtion of the lesions. Predictive signs for lesion inactivity are:

- Unchanged aspects on plain chest radiograph after 6 months of follow-up,
- Negative BK bacteriology (1, 2, 5).

Severe cases of tuberculosis were 3.3% of all cases and between 9 months of age and 17 years and 55% were bacteriologic acknowledged and treated with standard treatment between 9 months and 12 months. Clinical manifestation of the disease was determined not only by the quantity of bacili from the source patient but also by the patient's immunity and associated pathology (11, 12).

Bacteriological acknowledge of the pleuropulmonary tuberculosis were obtained in 14% of cases in accordance with the literature (1, 2, 5). The results have been influenced also by the time passed between collection of the biological products and their processing.

Toracocentesis was conducted under ultrasonographic guidance [3, 13]. Of all the pleuropulmonary tuberculosis and which received standard treatment, 16% have had stationary lesions starting with

month 4 to 6 from the beginning of the treatment and later at evaluation [9, 10].

Pleural lesions persistence may request later a surgical treatment [7, 12]. A quicker diagnosis by dosing the adenosisn deaminasis (ADA) may it make possible the rapid intiation of the adequate treatment [6, 8].

Similar results were obtained also by S. K Kabra who analyzed in his study 459 patients among which only 365 were able to be monitored and the overall curing rate using standard treatment was of 98% and among different forms of tuberculosis the curing rare was of 80% and 100%. Patients have been followed until they reached the end of treatment. Just in a few cases it was necessary to increase the duration of the treatment above standard treatment duration but in accordance with the guidelines. So, also S. K Kabra and his collaborators sustain the necessity and the efficacy of the standard treatment.

5. Conclusions

1. The persistence of lesions and their tendency to fibrosis was more dependent of the tuberculosis form than the hospital admission duration.
2. Extensive forms and pleuro-pulmonary forms had the most stationary radiologic images.
3. The evolution to sechelae of stationary images may it be predictable especially in those cases of late diagnosis and late treatment.
4. Complicated primary complex primary tuberculosis forms have had slow radiologic involution especially children aged 1 to 5.
5. Regarding the patients age groups we have observed that radiologic dynamics is slower among those with persistent radiologic signs and children aged 1 to 10.
6. Among children with standard treatment whatever age they had, 49% have had resorbtion of the lesions.
7. The tuberculosis forms which were treated 6 months, the stationary lesions and the sechelae were more numerous than those forms of tuberculosis treated longer.

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