III. PEDIATRICS

PHYSIOTHERAPY IN CYSTIC FIBROSIS IN SCHOOL CHILDREN AND TEENAGERS

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Summary

The purpose of the study was to compare the efficiency of different technique of clearance in cystic fibrosis. The lot of study consisted of 12 children from the records of the Cystic Fibrosis Centre Timisoara. The methods of clearance were: active cycle of respiratory technique and flutter – therapy. Conclusions: both tehchnique have the same efficiency, a consequent and correct physiotherapy is probably the most important factor in the prevention of a chronic pulmonary infection.

Key words: cystic fibrosis, physiotherapy, children

The premises of the study

Cystic fibrosis (CF) is the most frequent monogenic disease, autosomally recessive, with chronic evolution, progressive, lethal potential of the white population. CF is characterized by a clinical polymorphism, but the pulmonary involvement represents the decisive prognosis element. That is why the physiotherapy of the respiratory apparatus is a compulsory part in the management of the sick with CF. Physiotherapy allows the clearance of the respiratory channels and implicitly prevents the bacterial infection. The physiotherapeutic techniques are individualized according to age, the compliance of the sick person and the experience of the physiotherapist (2,3).

The purpose of the study

The purpose of the study was to compare the efficiency of some of the classical techniques of respiratory clearance (the active cycle of respiratory techniques – ACRT) with some newer techniques, flutter-therapy respectively (expiratory pressure positive oscillating).

Material and method

The study was performed between january 2003 – june 2004

The lot of study consisted of 12 children from the records of the Cystic Fibrosis Centre Timisoara (8 girls and 4 boys) with an age range between 8 and 18 years (average 12,4 years).

Depending on the applied techniques of physiotherapy, the lot was divided into two subgroups:

- gr. A: active cycle of respiratory technique (ACRT) carried out in various positions of postural drainage (fig.1, 2).
- gr. B:expiratory pressure positive oscillating (flutter – therapy) – fig.3.

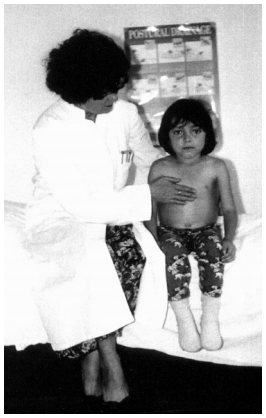

Fig. 1. Breathig control.
(phototeca of CF Centre Timisoara).

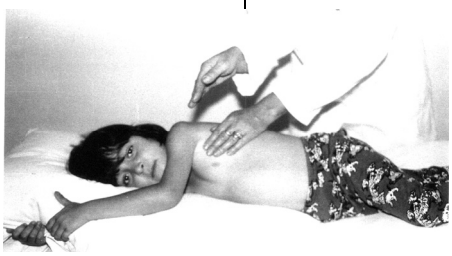

Fig. 2. Clapping in ACRT.
(phototeca of CF Centre Timisoara).

Fig. 3. Flutter therapy.
(phototeca of CF Centre Timisoara).

Followed parameters were: the character of the cough and of the phlegm and pulmonary physical signs; radiography and computer pulmonary tomography features; respiratory infection; nutritional status; respiratory functional tests (FVC, FEV1, FEF 25-75, FEV1 / FVC).

Results and Discussions

ACRT – mobilizes and eliminates the bronchial secretions in excess. It consists of: breathing control (RC), thoracic expansion exercises (TEE), the forced expiration technique (FET)

It can be applied in any position and it can be associated with the postural drainage. Between the various stages of the ACRT one can do percussions or tampotament and shake-ups (1,3).

Flutter-therapy combines the PEP technique (positive expiratory pressure) and therapy through oral oscillations of high frequency. It is done through a pocket device (Flutter VRP1). Flutter therapy improves ventilation and makes respiration easier (4,5,6).

At group A

The clinical and paraclinical data before physiotherapy were: general clinical state relatively good, productive cough in all children, the aspect of the phlegm suggestive for the isolated germ, constant and significant radiological modifications for CF (emphysema, mucus bronchogram etc.). Bronchiectasis were present in 5 children (through computer tomography – CT). Five out of the six have been infected (*Staphylococcus aureus* or *Pseudomonas aeruginosa*). The nutritional status was good in most of them. Ventilation functional tests were modified in 4 children.

After physiotherapy we observed: change in the characteristics of the cough (decrease up to disappearance), the aspect of the phlegm (in those for which the cough has remained the phlegm has become more fluid and clearer). Radiological and CT signs: were maintained for bronchiectasis but did not progress. was The persistence of the infection with *Pseudomonas* and the infection with *Staphylococcus* in one child. The ventilation functional tests have shown the increase of the quantified parameters (fig. 4)

Note: In the treatment of bacteria pulmonary infection, physiotherapy was dubbed by specific antibiotherapy.

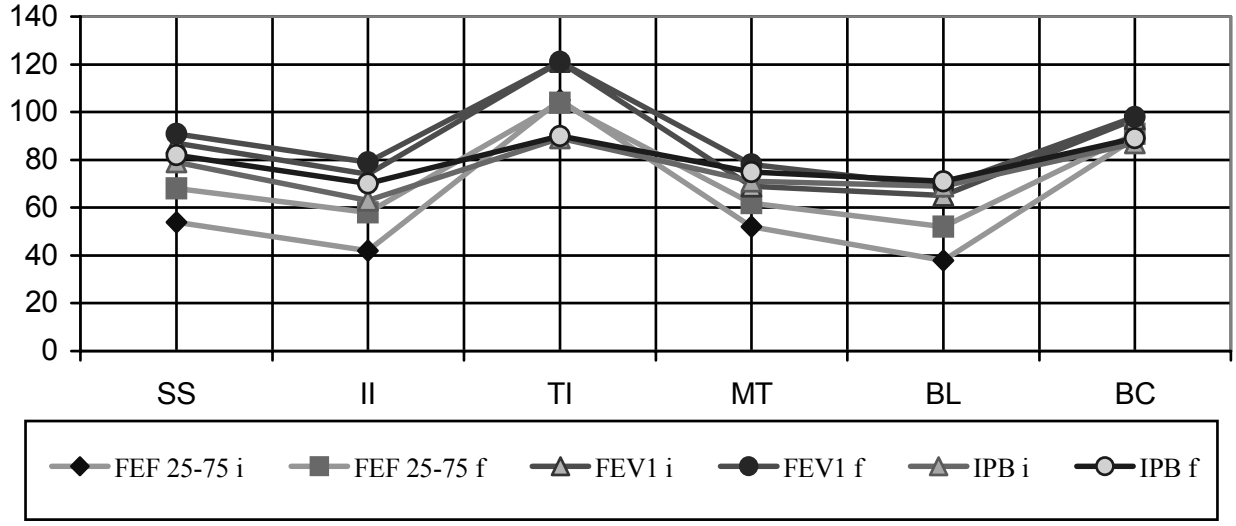

Fig. 4. The comparative values of the basal ventilometric indices before and after physiotherapy in group A.

At group B

The clinical and paraclinical data before physiotherapy were: most children with hyperinflation, increased dorsal cyphosis, clubbing, greenish productive cough, abundant in children infected with *Pseudomonas aeruginosa*. Bronchiectasis were present in 5 children. Three out of 6 were infected with *Pseudomonas aeruginosa* and 2 with S*taphylococcus aureus.* About status nutritiona, two children have shown a severe growing failure. The ventilation functional tests were modified in all children.

After physiotherapy we observed: the significant improvement of the general clinical state decrease of coughing, change in the feature of the cough, clearer and more fluid, but with the persistence of the infection with *Pseudomonas* in those with chronic infection. Nutritional status was good in 4 children, in one of them it has improved, and in another one the severe decrease in growing was maintained. The ventilation functional tests have shown the significant improvement of all the evaluated ventilometric indices (fig. 5).

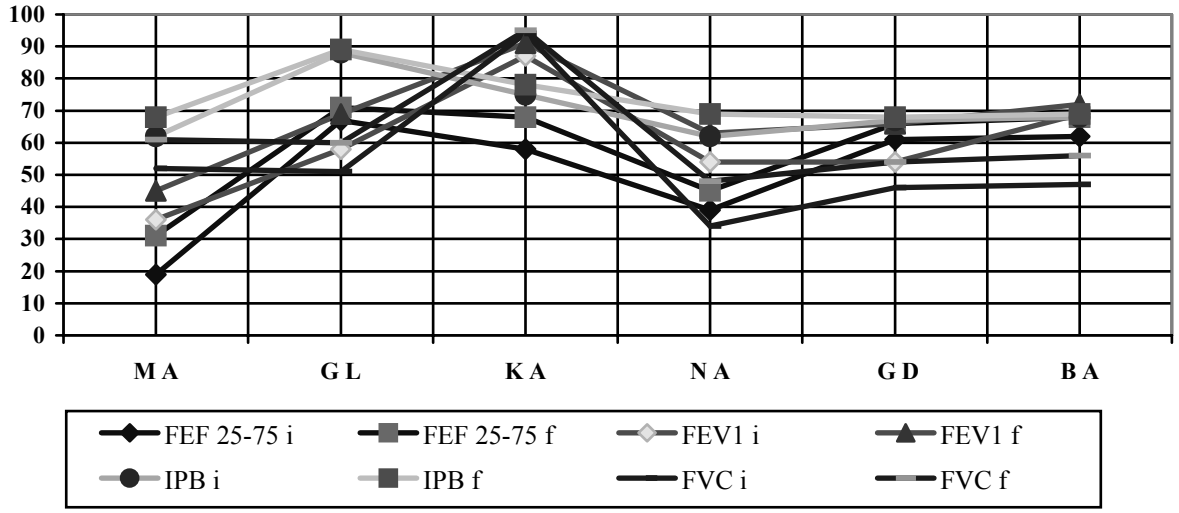

Fig. 5. The evaluation of the respiratory functional modifications before and after physiotherapy in group B.

Conclusions

At school age and teenage years the classical clearance techniques (ACRT) as well as the newest ones (Flutter-therapy) are equally indicated, they are both efficient, but the cost and accessibility to flutter may be an impediment in choosing this variant

Physiotherapy must be included in the management program of any person with cystic fibrosis, it has to start immediately after diagnosis and must be performed daily both when there are increases in infections, or lack of them, when the number of sessions increases.

A consequent and correct physiotherapy is probably the most important factor in the prevention of a chronic pulmonary infection and when added to antibiotics therapy it helps to the significant improvement of the prognosis and the maintenance of a quality of life as close to normal as possible.

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