The effects of daily pulmonary rehabilitation program at home on childhood asthma


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SUMMARY

Objective: the aim of this study is to investigate the efficacy of pulmonary rehabilitation program in children with asthma.

Patients and method: twenty eight children with mild persistent or moderate asthma were included into a double blind, randomised study. Sixteen children (9 girls, 7 boys) with the mean age of 10.8 ± 2.3 were assigned to receive pulmonary rehabilitation program with their parents for 30 days (group I). Control group included 12 children (6 girls, 6 boys) with the mean age of 10.2 ± 2.4 (group II). Symptom and medication scores quality of life index and pulmonary function tests were evaluated in rehabilitation and control group in the beginning of the study and after the one month period.

Results: the groups did not differ on all parameters before the study (p > 0.05). Statistically significant decrease were found in symptom and medication scores in rehabilitation group (p < 0.05) and quality of life index was increased significantly in the same group (p < 0.05). Pulmonary function measures also significantly improved including vital capacity, forced vital capacity, FEV1, PEF and FEF25-75 in the rehabilitation group (p < 0.05). The best improvement were seen in FEF25-75 (10.09% increase) and PEF (7.81% increase) values. In control group no statistically significant differences were found in all parameters.

Conclusion: in this study it was shown that daily pulmonary rehabilitation at home could improve quality of life and pulmonary functions. So pulmonary rehabilitation should be placed as a component of management in childhood asthma.

Key words: Pulmonary rehabilitation. Childhood, asthma.


INTRODUCTION

A number of patients with chronic obstructive pulmonary diseases and asthma is on the rise over all the world. Education, environmental control and drug therapy are the corner stones in the management of asthma. Nowadays pulmonary rehabilitation is a recognised discipline for stabilisation and improvement of asthma and chronic obstructive pulmonary diseases. Pulmonary rehabilitation program (PRP) could improve the quality of life, pulmonary functions, exercise tolerance, reduce the symptoms and anxiety of patients and decrease frequency and duration of hospitalisation (1-6).

The aim of this study is to investigate the efficacy of pulmonary rehabilitation program in children with asthma.

PATIENTS AND METHOD

Twenty eight children with mild persistent or moderate asthma were included into a double blind, randomised study. Sixteen children (9 girls, 7 boys) with the mean age of 10.8 ± 2.3 were assigned to receive pulmonary rehabilitation program with their
parents for 30 days (group I). Control group included
12 children (6 girls, 6 boys) with the mean age of 10.2
± 2.4 (group II). Children in both groups were
comparable according to the stage of asthma and they
had been using same drugs at least for six months.

Pulmonary rehabilitation program consisted of
relaxation exercises, endurance exercises, breathing
exercises and rhythmic mobilisation exercises.
Patients and their parents had visited Physical
Medicine and Rehabilitation Department at the first
visit and they were thought to perform this program
at home for 30 days. Symptom scores, medication
scores (7), quality of life index (8) and pulmonary
function tests were evaluated in rehabilitation and
control group in the beginning of the study and after
the one month period.

STATISTIC

The results in both group were given as mean scores
and standard deviation. The findings indicated that non
parametric methods were appropriate so Wilcoxon
matched pairs test was used for difference between
results at baseline and after the study. Mann-Whitney
U test was used for comparing the groups. A p value
of < 0.05 was regarded as statistically significant.

RESULTS

Symptom and medication scores and quality of life
index of group I and group II were listed in table I.
The groups did not differ on all parameters before the
study (p > 0.05). Statistically significant decrease
were found in symptom and medication scores in
rehabilitation group (p < 0.05 ) and quality of life
index was increased significantly in the same group
(p < 0.05) (table I). Pulmonary function measures
also significantly improved including vital capacity,
forced vital capacity, forced expiratory volume in the
first second of expiration, peak expiratory flow rate
(PEF) and FEF_{25-75} in the rehabilitation group (p <
0.05). the best improvement were seen in FEF_{25-75}
(10.09 % increase) and PEF (7.81% increase) values
(table II).

In control group no statistically significant
differences were found in symptom and medication
scores, in quality of life index, even in pulmonary
function tests (p > 0.05).

DISCUSSION

Pulmonary rehabilitation program had both
physiological and psychological beneficial effects on
patients with chronic obstructive pulmonary
diseases. Pulmonary rehabilitation relaxes the chest
muscles, improves ventilation, decreases work of
breathing and decreases the anxiety of patients and
their parents.

In this study it was shown that pulmonary
rehabilitation could improve the quality of life and
pulmonary functions. Similar to our results Cambach
et al had reported that quality of life and exercise
capacity improved after the rehabilitation program (2).
Field et al also had demonstrated that children with
asthma had improved pulmonary function after the
daily relaxation and massage therapy (4). They
found best improvement in FEF_{25-75} values like our finding which reflects the small airway obstruction. These results mean PRP could lead improvement in airway obstruction and control of asthma.

In another study that were carried out by Cox et al it was shown that pulmonary rehabilitation had beneficial effects on endurance, psychological variables, quality of life, skills, coordination, smoking habits, airway obstruction and dyspnea (6). However bronchial hyperresponsiveness, need of pulmonary drugs and complaint of cough did not change. They followed patients for two years and long term effects of PRP were evaluated. Our study is a preliminary study and long term effects of PRP is well not known.

The cost effectiveness of PRP is another point that could discuss. In our group PRP was performed at home by parents and it makes less cost. If we had enough data about the results of PRP performed by physiotherapists we could make a comparison for these both methods. Effects on psychological variables and compliance could not be evaluated in this study.

In conclusion because of the beneficial effects on quality of life and pulmonary functions pulmonary rehabilitation should be placed as a component of management in childhood asthma. Further studies are needed to investigate the long term effects and cost effectiveness of PRP.

REFERENCES


RESUMEN

Objetivos: el objetivo de este estudio fue investigar la eficacia de un programa de rehabilitación pulmonar para niños asmáticos.

Pacientes y método: veintiocho niños con asma leve persistent o moderada fueron incluidos en un estudio aleatorio doble ciego. Diecisésis niños (9 chicas y 7 chicos, edad media 10,8 ± 3,5 años) fueron incluidos en un programa de rehabilitación pulmonar de 30 días de duración que realizaron con sus padres (grupo I). El grupo control incluyó 12 niños (6 chicas y 6 chicos, edad media 10,2 ± 2,4 años) (grupo II). Se evaluaron las puntuaciones por síntomas y el consumo de fármacos, el índice de la calidad de vida y las pruebas de función pulmonar en los grupos de rehabilitación y control al principio del estudio y después de un intervalo de un mes.

Resultados: antes del estudio no se encontró ninguna diferencia entre grupos en los parámetros (p > 0,05). Después de un mes de rehabilitación, se encontró una disminución estadísticamente significativa en las puntuaciones por síntomas y consumo de fármacos (p < 0,05) y un índice de calidad de vida significativamente mayor (p < 0,05). Las mediciones de función pulmonar también mejoraron significativamente, incluyendo la capacidad vital, capacidad vital forzada, FEV_{1}, PEF y FEF_{25-75} en el grupo de rehabilitación (p < 0,05). La máxima mejora se constató en los valores del FEF_{25-75} (un incremento del 10,09%) y PEF (un incremento del 7,81%). No se observó ningún cambio estadísticamente significativo en los parámetros del grupo control.

Conclusion: este estudio ha demostrado que un programa de rehabilitación pulmonar diaria en el domicilio puede mejorar la calidad de vida y función pulmonar. Por lo tanto, la rehabilitación pulmonar debería incluirse en el tratamiento del asma infantil.

Palabras clave: Rehabilitación pulmonar. Infancia. Asma.

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