

Physiotherapy in Adolescents with Idiopathic Scoliosis. Randomized Clinical Trial (RCT)

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Abstract: *Background and Purpose: Many treatments are available for adolescents with idiopathic scoliosis, but the purpose of this study was to evaluate the effectiveness of back school and Mezieries method in patients with mild adolescent scoliosis (AIS). Design or describe: Randomize Clinical Trial. Materials and Methods: This was a parallel-group, randomized in which 38 patients were randomly assigned to a rehabilitation programme consisting of mezieries method and back school exercise (experimental group 19 subjects) and (19 subjects control group).This study covers a period of two years, September 2013 and September 2015,Clinical Physiotherapy Fisiomed,Tiranë. Results: Total results of 38 patients (30 girls and 8 boys) whose average age was 12,23 years and average Cobb angle was 22,38 at the beginning of the treatment. After a mean treatment period of 1 years, their average Cobb angle changed to 13, 38.We applied back school exercise and another specific method known as Mezieries. Adolescents who were in the stage of holding the brace, two methods were alternated with a frequency 2 times in a week. Meanwhile the adolescents with Cobb angle under 45 degrees, did the rehabilitation at a frequency of one times in a week with intensity 45-60 minutes. Conclusion: Physical therapy can be indicated for patients with idiopathic scoliosis. Back school exercise and the most Mezieries method lists of effective and useful options for idiopathic scoliosis*

Keywords: Active exercises, scoliosis idiopathic, rehabilitation, Mezieries

1. Introduction

Scoliosis, simply defined as a lateral curvature of the spine, has been recognized clinically for centuries. The deformity is actually much more complex and to describe more completely and quantify scoliosis deformity, three planar and three dimensional terminology and measurements are required (Samuel Kadoury, et al 2008). Adolescent idiopathic scoliosis is found between 10 years of age and skeletal maturity as we found out in our study. This form accounts for the majority of cases of idiopathic scoliosis (M. Timothy Hresko, et al 2015). The cause of adolescent idiopathic scoliosis is unknown, it is generally considered to be multifactorial in origin and thought to have separate factors for curve initiation and progression (Maruyamat et al 2003). There are some physicians who believe it is not useful to treat scoliosis conservatively, and the best way is "to wait and see". That is to say, follow the patient without proposing conservative treatment until a Cobb degree three should be achieved, which would indicate that spinal surgery is necessary (C. Fusco et al 2003). There are others who believe conservative treatment should be started as soon as possible to avoid surgery (Negri et al 2008). Treatment strategies for idiopathic scoliosis include conservative treatment and surgery. There is consensus about surgical treatment in a minority of patients with spinal curvatures greater than 45 degrees, especially in patients with severe rotational abnormalities (Toro. Met al 2008). The prevalence of adolescent idiopathic scoliosis in our study is 3% to 4% of children between 10 and 17 years of age. The ratio of girls to boys is equal in adolescents with spinal curvatures of 10 degrees. With spinal curvatures greater than 30 degrees, the ratio increases to 10 girls for every boy, and the scoliosis in girls tends to progress more often. Only 10% of adolescents diagnosed with scoliosis have curve progression requiring medical intervention (Kouwenhoven Jw et al 2008).

2. Materials and Methods

2.1 Purpose

This randomized design study wanted to clear effectiveness of Mezieries Method and back school exercise.

2.2 Method and Samples

Adolescents with a diagnosis of scoliosis were referred from an Orthopedic doctor. A total of 38 adolescents aged 9-17 years were involved in the study. The adolescents were treated between September and October 2015 in "Fisiomed" centre of rehabilitation for our patients. They were randomly allocated into two groups: the first group received Mezieries Method (MM group) and the second group received a set of exercises known by name Back school Exercises (Bcs group). The randomization was conducted according to the angle of Cobb. They were screened for the clinical presentation of AIS by trained physiotherapists with the following eligibility criteria (Negri et al 2011)

Inclusion criteria:

- 1) Age between 9 to 17 years
- 2) Positive Adam's Forward Test
- 3) AIS diagnosis (Wang et al 2008)
- 4) Risser 3-4

Exclusion criteria:

- 1) Postural Scoliosis
- 2) Curv less than 10°
- 3) Age younger than 9 years
- 4) A history of spinal surgery (Wang et al 2008)

3. Study Protocol

The first group (MM Group) received a standardized application that know by name Mezieres Method. Which consists in stretching , in relaxing of tensions of the muscles and restoring their initial lengths so that the body regains its harmonious form and the most important is the postural correction . This method applied in the infrequent once time a week and the duration 45"-60" of a session, without home exercises ,were used for 6 months and 1 years (Paul Barbieux).The second group (Bsc group) that know by name Back School method is based on a program of exercises that aims to improve mobility, flexibility, and strength (Andrade et al 2005) .Patients allocated to this group received theoretical and practical information during the treatment sessions. The protocol of advice and exercises of this method was 2 time in week. Treatment was provided by experienced physiotherapists with an international qualification for physical methods .

Outcome Measure

Primary outcome measures for scoliosis consist of radiographic parameters, frontal measurement and sagittal profile. The radiological examination conducted by an orthopedic doctor

As secondary outcome measures we used Incidence (risk) of progression can be calculated according to the formula by Lonstein and Carlson (1984)According to the indication guidelines (Weiss et al. 2008) we have to distinguish between an-Indication for observation only (Incidence (risk) of progression-Indication for physiotherapy (Incidence (risk) of progression 40-60%).The change of Cobb degrees and the incidence (risk) of progression ,which is calculated by the formula: $\text{Cobb angle} \times (3 \times \text{Risser stage}) / \text{chronological age} = \text{Progression factor}$; Was assessed six months after treatment and one year after treatment

Statistical analysis

4. Results

A total of 38 patients ((19 in Mezieres Method group and 19 in the Back school group)) completed the treatment period of 1 years .The average age of MM group patients was

13,36±12 years and the average age of the Bcs group was 11,10±10 years Tab 1

Group	MM Age	Group Bcs Age
Average Mean	13,36	11,10
St deviation	2,36	1,99
Median	13	10
Mode	12	10
Minimum	10	9
Maximum	17	16

Table 2: The average angle Cobb in the MM group was 24,47°±22° and the average angle of Cobb in the Bcs Group was 12,26°±11°.What we look in the both groups ?That the angle Cobb in the MM group is greater than the angle Cobb in the Bcs group .The patients in the MM group need physiotherapi intensively

Angle Cobb Tab 2	MM Group	Bcs Group
Average	24,47°	12,26°
St deviation	5,64°	1,79°
Median	23°	12°
Mode	22 °	11°
Minimum	18 °	10°
Maximum	39 °	16°

Table 3: Comparison of Cobb degrees between two groups

Angle Cobb	MM Group Mean ±SD	Bsc Group Mean ± SD	P value
Baseline	24,47±5,64	12,26±1,79	0.81
After 6 M	21,47±5,23	10,26±2,18	0,47
After 1Y	16,52± 4,92	4,73±3,05	0.01

SD-standarddeviation,6 M-six months,1Y-a year

The average Cobb angle in MM group decreased from 24,47 ° (± 5,64°) to 21,47° (± 5,23°) after six Months in 16,52° (± 4,92°) after one years . In MM Group 50.0% of the patients improved by more than 5 degrees, and te average Cobb in MM group decreased from 24,47°± 5,64° to 21,47°±5,23° after 6 Months and in 16,52° ±4,92° after one Year .While the average Cobb in Bcs group decreased from 12,26° (±1,79 °) to 10,26° (±2,18 °) after six Months in 4,73° (±3,05 °) after one years. The results were statistically significant in the MM group after one year p < 0.01.



In both groups, regardless the angle of Cobb, stage of Risser and chronological age that are different improved significantly after treatment. Patients in MM group had significantly after one year of treatment. There was not much difference between the MM group and Bck group after six Months of treatment (Table 6)

5. Discussion

The purpose of this study was to determine the effect of Mezeries Method and to compared with back school method. In our rehabilitation protocol of experimental group we preferred Mezeries method which have curvs more than 25 degrees. It was demonstrated that both strategies are effective in reducing pain, in decreasing the angle of cobb, improvement of asymmetry skeletal. We identified a significant improvement of the outcomes after one year of treatment in the MM group. There was no significant difference after six months of the treatment. In the table 3 we look that the average angle Cobb in the MM group was $24,47^{\circ} \pm 22^{\circ}$ greater than the average angle of Cobb in the Bcs Group $12,26^{\circ} \pm 11^{\circ}$. However the experimental group in the MM group have had the most better results than the control group in back school exercise. We think that the sudden effects may have been potentially due to Mezeries Method, which reduces the proportion of children with adolescent idiopathic scoliosis. Study that claimed the effects of physical exercise is it also, Cobb asserted that physical exercise is beneficial when practiced in order to improve the muscle strength and tone, vital capacity and posture of the scoliotic subject (Cobb J et al 1948; Weiss et al 2003)

6. Conclusion

The study shows that the patients with idiopathic scoliosis can be treated successfully with physiotherapy mainly with Mezeries Method. When scoliosis and in the early stages of evolution and reduced while attracting risk and significant postural collapse. Despite the small sample that was used study provides an efficient protocol to help the physiotherapists for rehabilitation of patients with idiopathic scoliosis. Future studies also need to involve large numbers of patients, and measure both short-term and long-term outcomes. More research is also needed to establish a standard protocol of treatment for idiopathic scoliosis, and to develop valid and reliable outcome measures for these conditions.

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