Scoliosis

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Adult scoliosis and non-specific low back pain: analysis of trunk kinematics

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Background

Adult scoliosis (AS) is an emerging issue in the field of spinal deformities management [1]. The increased prevalence results from the cumulative effect due to aging of patients affected by juvenile scoliosis (JS) plus the appearance of new cases in adult age.

Aim

To provide data about trunk kinematics performance in patients with AS, and to compare it with non-specific low back pain (NL).

Methods

Cotrel method was used to assess Cobb angle (CA) on plain x-ray. Bilateral trunk side bending (SB) and extension (TE) were evaluated with a two optoelectronic cameras (14markers, Gemini BTS spa, Milano, Italy)[2]. During active range of motion (aROM, °), speed of motion (SOM, °/sec) and error in trunk repositioning (ETR, °) were measured. Patients performed, as allowed by pain or discomfort, two movements for each direction.

Results

AS-Group included 40 patients (10 men and 30 women, CA >15°, age 61.8±11.5 years, BMI 23.6±2.8kg/m2). A single curve was present in 32 patients (80%). CA of primary curve averaged 27.1±11.5° (range, 15–63°), thoracic CA averaged 25.5±22.3° (range, 8–58°). NL-Group included 40 patients, 9 men and 31 women (age was 58.2±10.9 years, BMI 23.9±3.2kg/m2). NL-Group averaged 35.7±12.3° in aROM on the right side, and 35.2±11.2° on the left (SOM 28.1±13.6°/sec) (p>0.05). AS-Group averaged 34.6±10.6° of aROM on the right side, and 35.5±12.5° on the left side (SOM 31.8±11.7°/sec) (p>0.05). Global trunk mobility during SB test averaged 71.0±21.2° in NL-group and 64.2±29.1° in AS-group (p>0.05), with no differences when considering the two different directions. During SB, 26% of the trunk aROM derived from the relative contribution of lumbar segment (L1-L5) (AS vs NL p>0.05). TE averaged 23.7±8.1° in NL-Group, (L1-L5: 54.5±26.3%) and 22.6±8.1° in AS-Group (L1-L5: 60.8±30.6%) (p>0.05). NL group ETR was 3.4±2.7° during SB and 3.6±2.0° during TE (p>0.05). In AS group, ETR was 3.4±1.5° during SB and 2.9±2.0° during TE (p>0.05).

Conclusions

In an AS-Group of patients, the kinematic performance, and the ability to control spinal motion (SOM and ETR), was similar to a NL-Group. Mild to moderate scoliosis is not influencing the motor control of the spine. As previously shown in NL[3], physiotherapy programs for AS do not require more attention in trunk proprioception.

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