FOOT PRESSURE DISTRIBUTION AND FUNCTIONAL LEVELS: ANKYLOSING SPONDYLITIS VS CONTROLS

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Background: Ankylosing spondylitis (AS) is a chronic rheumatic disease characterized by the inflammation of the pelvis and spine with a tendency to bony ankylosis. The most common AS-related alterations in posture are, the limitation of spinal mobility, head protration, loss of lumbar lordosis, increased dorsal kyphosis, flexion contracture of the hip and consequent flexion of the knee.

Objectives: The purpose of this study was to investigate the foot pressure distribution and functional levels differences in ankylosing spondylitis and also compare with healthy individuals.

Methods: Eighteen patients with ankylosing spondylitis (median age= 42.2 ±2.4 years, median BMI=25.27±1.27 kg/m²) and 17 controls (median age= 43.1±2.4 years, median BMI=26.78±1.27 kg/m²) were included in the study. Plantar pressure distribution was recorded by Digital Biometry Scanning System and Milletrix software (DIASU, Italy). The static test was used to determine the maximum foot pressure (N/cm²) of the foot, forefoot weight ratio, rarefoot weight ratio, total load and foot angle axis (FAA). When evaluating spinal mobility; lumbar flexion, lateral flexion and tragus to wall distance were used in Bath Ankylosing Spondylitis Mobility Index (BASMI) sub-parameters. The Bath Ankylosing Spondylitis Disease Activity Index (BASDAI) was used to determine the disease activity; The Bath Ankylosing Spondylitis Functional Index (BASFI) was used to measure functional impairment; The Ankylosing Spondylitis Quality of Life (ASQoL) Questionnaire was filled out by the patients in an attempt to understand the impact of the disease on the quality of life. Mann-Whitney U test was used to compare AS groups with the control group. Spearman test was used for correlation analysis.

Results: No difference between age (p=0.031) and BMI (p=0.012) in both groups. There were no differences modified Schober (p=0.184), lumbar flexion (p=0.160) and tragus to wall distance (p=0.434). But lower right lateral flexion (p=0.003) and left lateral flexion (p=0.001) in ankylosing spondylitis group when compared to healthy individuals. Rearfoot load higher than forefoot load in ankylosing spondylitis group (p=0.001). There were no differences static and dynamic analysis parameters ankylosing spondylitis group and healthy group. In addition to right lateral flexion (r=0.645 p=0.005) and left lateral flexion (r=0.641 p=0.04) correlated foot angle axis; tragus to wall distance correlated maximum foot pressure (r=0.578 p=0.015) and average foot pressure (r=0.542 p=0.025).

Conclusion: Lumbar spine flexibility was lower and associated with foot pressure distribution in AS patients. In addition, the load distribution between the rare and fore foot was different in these patients. Therefore, the foot pressure distribution as well as the spine flexibility should be monitored closely, when implementing and designing the exercise programs in patients with AS.

REFERENCES

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PULMONARY FUNCTIONS AND RESPIRATORY MUSCLE PERFORMANCE CORRELATE WITH NIGHT PAIN IN PATIENTS WITH ANKYLOSING SPONDYLITIS COMPARED TO CONTROLS

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Background: In ankylosing spondylitis (AS), chronic systemic inflammation mainly affects the axial skeleton and involvement the costovertebral and costotransvers joints results in limitation of thoracic and spinal mobility (1,2). There is no study published to evaluate the endurance and strength of respiratory muscle and to investigate the relationship with pain.

Objectives: The aim of the study was to investigate the functional status, quality of life, pain, pulmonary function, respiratory muscle strength and endurance patients with AS and compare to healthy controls.

Methods: Standard pulmonary function tests, maximum inspiratory pressure (PImax), and maximum expiratory pressure (PEmax) for pulmonary volumes and respiratory muscle strength were applied. Respiratory muscle endurance was recorded using sustained threshold loading of 40% maximal inspiratory pressure. AS group were evaluated by using the functional status and quality of life, the Bath Ankylosing Spondylitis Functional Index (BASFI), Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), Ankylosing Spondylitis Quality of Life Questionnaire (ASQoL). The severity of night pain, morning pain and morning stiffness were evaluated by Visual Analog Scale (VAS) in patients with AS. Mann Whitney-U test and Student’s Test were used to compare to groups variables. To evaluate the correlation in AS group Spearman’s Test was used.

Results: A total eleven patients (6 female, 5 male; mean age: 41.9±4.4yrs, body mass index (BMI): 26.1±5.3kg/m² and duration of disease ≥24.9months) and eleven controls (6 female, 5 male; mean age: 42.9 ±12.7yrs and BMI: 25.5±3.6kg/m²) were included in this study. There were no differences in age (p=0.554) and BMI (p=0.922) between the groups. No difference between FEV1% (p=0.069), FEV1/FVC% (p=0.243), PEF% (p=0.490), FEF25-75% (p=0.297), MVV% (p=0.450), PImax (p=0.694), PEmax (p=0.358) and respiratory muscle endurance (p=0.341) in both groups. But FVC% (p=0.041) significantly lower in AS group compare to controls. In addition to PImax (r= -0.800, p=0.003), PEmax (r=-0.683, p=0.021) and respiratory muscle endurance (r=0.683, p=0.021) were correlated the night pain level in AS group. The respiratory muscle endurance (r=0.675, p=0.023) was correlated the duration of disease. No correlations to the functional status, quality of life indexes and pulmonary functions in AS group.

Conclusion: This study shows that patients with AS have clearly reduced maximal PImax and PEmax, indicating decreased respiratory muscle strength and endurance as night pain levels increased. If indeed the respiratory strength were to be unchanged or even increased the decreased respiratory muscle strength should be due to reduced strength or atrophy of intercostal or accessory muscles, or both. Although the present data do not provide the direct evidence of muscle atrophy, it is tempting to speculate that immobilization of these muscles due to thoracic rigidity and decreased inspiratory intercostal and accessory activation leading to disuse may be an important factor contributing to it.

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