

THE IMPACT OF SCOLIOSIS ON INTERNAL ORGANS

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Abstract: Scoliosis is a complex, three-dimensional spinal deformity characterized by a lateral curvature of the spine. This condition is not only associated with physical discomfort and postural changes but can also have a significant impact on the internal organs. The degree of impact largely depends on the severity of the curvature, the age at onset, and whether scoliosis is progressive.

Keywords: inertinal system, scoliosis, respiratory system, lung disease, gastrointestinal (GI) system, lumbar spine, kidneys, autonomic nervous system.

Introduction

One of the primary internal systems affected by scoliosis is the respiratory system. Severe spinal curvature can lead to thoracic insufficiency, a condition where the chest cannot support normal breathing or lung growth. This is particularly concerning in individuals with early-onset scoliosis, as the lung development during childhood can be significantly compromised. Curvatures that compress the ribcage reduce lung capacity, leading to restricted airflow and, in severe cases, respiratory complications such as restrictive lung disease. Scoliosis, particularly in cases with high thoracic curves, can also affect the cardiovascular system. When the spine curves significantly, it can compress the heart or push it to one side, making it more challenging for the heart to pump effectively. In severe cases, this may lead to increased blood pressure within the pulmonary arteries, a condition known as pulmonary hypertension, which strains the right side of the heart and can lead to right heart failure if untreated.

2. Materials and methods of research

The impact of scoliosis on the gastrointestinal (GI) system is often indirect but still notable. When the spine curves, especially in the lumbar region, it can displace the abdominal organs, compressing the stomach, intestines, and other digestive organs. This displacement can lead to symptoms such as acid reflux, constipation, and abdominal pain, particularly if the scoliosis is progressive. The compression of the GI tract may also slow down the digestive process, leading to chronic discomfort and nutritional challenges. In some cases, scoliosis can impact the kidneys and urinary system. Curvatures that extend into the lower thoracic and lumbar spine may cause displacement or compression of the kidneys, potentially impairing kidney function over time. Compression of the urinary tract may also result in difficulties with urination, which can lead to urinary retention or recurrent urinary tract infections. Scoliosis can also affect the nervous system, which indirectly impacts organ function. The abnormal curvature may put pressure on nerves exiting the spine, leading to disrupted signals between the brain and organs. This can manifest as issues with bladder control, bowel function, and other autonomic nervous system functions. A sideways curvature disrupts the spine's alignment, affecting its ability to support the body's weight evenly. It can lead to uneven strain on muscles, ligaments, and vertebrae, causing pain and reducing flexibility. The

experimental method developed by us included a set of physical exercises aimed at correcting scoliosis and consisting of special exercises for the formation of a stable muscular corset of girls, as well as exercises that increase the functional capabilities of the cardiovascular and respiratory systems and promote active correction of the chest and spine. The method included two stages.

Chest radiographs of PCD patients were systematically screened for existence of significant lateral spinal deviation using the Cobb angle. Positive values represented right-sided convexity. Curve convexity and Cobb angles were compared between PCD patients with situs inversus and normal anatomy.

Conclusion

In conclusion, scoliosis, especially in its severe forms, is more than a structural condition affecting posture; it has extensive implications for the functioning of various internal organs. Managing scoliosis is essential not only to alleviate physical pain and improve posture but also to reduce its impact on vital organs. Early intervention, regular monitoring, and, in severe cases, surgical treatment are critical in mitigating the adverse effects of scoliosis on the respiratory, cardiovascular, gastrointestinal, renal, and nervous systems. This study supports our hypothesis on the correlation between organ anatomy and curve convexity in scoliosis: the convexity of the thoracic curve is predominantly to the right in PCD patients that were 'randomized' to normal organ anatomy and to the left in patients with situs inversus totalis.

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