A survey on Spinal Abnormalities among Children and Adolescents Aged 6 to 18 in China

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Summary

The problem of spinal curvature abnormalities among Chinese children and adolescents is relatively severe. Using a spinal function assessment instrument, the spinal curvature of 1,304 children and adolescents aged 6 to 18 was measured. Issues of varying degrees were found in uneven shoulders, pelvic obliquity, neck obliquity, thoracic obliquity, and lumbar obliquity, with differences observed between genders and ages. This investigation provides a data foundation for the prevention and intervention of spinal abnormalities among children and adolescents.

Introduction

The issue of abnormal spinal curvature among Chinese children and adolescents is relatively serious, with scoliosis becoming the third major disease that endangers their health. This not only adversely affects the development of their internal organs, bones, and muscles but may also lead to severe problems such as pain and even impact their mental health.

Methods

Using a computer vision-based spinal function assessment device, the spinal curvature of 1,304 adolescents aged 6 to 18 was tested. Participants were required to stand in front of the testing device in tight-fitting clothing for 10 seconds to obtain the results.

Results and Discussion

Among the 1,304 adolescents aged 6 to 18 tested, only 0.2% had no shouldertilt, 99.6% had left shouldertilt, and 0.2% had right shouldertilt. The prevalence of uneven shoulders was 9.4%, with higher rates observed among those aged 8, 10, 11, and 14. When comparing boys and girls, boys (11.5%) had a higher prevalence of uneven shoulders than girls (7.6%). There was a significant difference in shouldertilt angles, with boys averaging 1.54±1.14 cm and girls averaging 1.35±1.1 cm.

Hiptilt towards the left accounted for 98.3%, towards the right for 1.2%, and notilt for 0.5%. Pelvic obliquity was observed in 4.5% of the participants. The average hiptilt angle was 1.38±1.01 cm for boys and 1.30±2.28 cm for girls, with no significant difference except for those aged 18, where girls had a greater angle than boys. Pelvic obliquity was found in 5.2% of boys and 3.9% of girls.

Neck curvature towards the right accounted for 93.5%, towards the left for 6.5%, and neck obliquity for 5.3%, with the issue being relatively severe among those aged 11 to 16. Chest curvature towards the right was 57.2%, towards the left was 42.8%, and chest scoliosis was observed in 3.5% of cases, mainly concentrated among those aged 11 to 16, with a significant difference in chest scoliosis angles between boys and girls. Lumbar curvature towards the right was 76.8%, towards the left was 23.2%, and lumbar scoliosis was observed in 0.7% of cases, with a significant difference in lumbar scoliosis angles between boys and girls.

Previous studies on spinal curvature abnormalities among children and adolescents have been mostly focused on sagittal plane investigations[1]. According to the survey results, uneven shoulders, forward neck tilt, and anterior pelvic tilt are the main issues among children and adolescents[2]. This study complements the detection of coronal plane spinal curvature abnormalities among Chinese children and adolescents, providing a theoretical basis for the prevention and intervention of spinal health problems.

Conclusions

1.The primary spinal issues among Chinese children and adolescents include uneven shoulders, pelvic obliquity, neck scoliosis, thoracic scoliosis, and lumbar scoliosis. Among them, the majority of shoulder and hip joints exhibit a leftward tilt, while the neck, thorax, and lumbar region predominantly curve to the right.

2.There are gender differences in abnormal spinal curvature, with boys generally exhibiting a higher prevalence and greater angles of scoliosis compared to girls.

3.Abnormal spinal curvature also exhibits age differences.

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