Scoliosis

BioMed Central

Oral presentation

Open Access

Evaluation of a posture tracking system

MS Wong* and WY Wong

Address: Department of Health Technology and Informatics, The Hong Kong Polytechnic University, Hung Hom, Hong Kong

Email: MS Wong* - m.s.wong@polyu.edu.hk

* Corresponding author

from 6th International Conference on Conservative Management of Spinal Deformities
Lyon, France. 21-23 May 2009

Published: 14 December 2009

Scoliosis 2009, **4**(Suppl 2):O60 doi:10.1186/1748-7161-4-S2-O60

This abstract is available from: http://www.scoliosisjournal.com/content/4/S2/O60

Objective

The purpose of this study was to examine a portable posture monitoring and training system developed for tracking daily posture information and posture improvement.

Background

Spinal deviations usually refer to abnormal lateral or sagittal curvature that could be the cause or effect of some spinal diseases. The conventional orthotic intervention is to apply passive forces to a patient's body with an orthosis for supporting and controlling the trunk alignments. However, once the orthosis is removed, such functions cannot be maintained. Therefore, an active posture training approach is proposed for suitable clinical cases, as it can keep the trunk in appropriate posture using the patient's own back muscles, and a long-lasting effect is anticipated.

Materials and methods

A portable posture monitoring system was developed, which consists of 3 inertial sensor modules, a data logging and feedback system, an integrated garment, and software for posture analysis and training. The sensor modules were used for tracking posture change at the thoracic and lumbar regions on the sagittal and coronal planes relative to a neutral position, in terms of curvature alteration measured between adjacent sensor modules. An auto-reset algorithm was designed for minimizing the error due to the inherent limitations of the inertial sensors. An opto-electronic motion analysis system was used for accuracy comparisons.

Results

The results showed that inertial sensor modules could provide trunk posture information, and its measurements were found to be comparable to those of the motion analysis system (averaged RMS differences < 4.3o for the sagittal plane and < 3.6o for the coronal plane, correlation coefficient > 0.829 in domain planes of movements during flexion and lateral bending). The system was used to monitor posture changes of 5 healthy human subjects during daily activity over a period of 4 days with different thresholds set for providing an audio-biofeedback signal.

Conclusion

The findings demonstrated the potential of this system in facilitating posture training. It is worthy of further developments, and the ultimate goal is application in occupational health promotion as a prophylactic measure for those jobs with a high risk of back problems as well as a treatment option for the patients with posture deformities or spinal diseases.