Scoliosis

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Can scoliosis follow up by surface topography (Biomod-L®) securely predict Cobb angle progression? Longitudnal study; preliminary results on 60 patients

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Background

The gold standard parameter for scoliosis follow-up is the Cobb angle from full spine radiographs. However, the repetition of X-rays on children and adolescents may increase future cancer risks [1,2]. Our project is to space out X-rays assessments by using a Moiré based Surface Topography device (Biomod-L®).

Two reference postures have been selected after a preliminary study: 1) Joined elbows and coiled shoulders (dorsal hump measurement); 2) Erected position, hands grasping wall bars (all other measurements).

Purpose

Can the progression of Biomod-L® parameters securely predict the progression of Cobb angles measured on X-rays?

Materials and methods

60 patients (mean age 13,4 years old ; 9-18) who had undergone at least two simultaneous X-Rays + Biomod-L® assessments were included in a row. This provided a total of 75 "follow up segments" distributed on different periods of growth, preliminary follow up and treatment follow up.

The X-rays criteria were +3° for progression and -5° for improvement. The Biomod-L® progression was assessed on the hump, lordosis, spinal curves and list measurements, and on a subjective comparison of the fringe mapping.

Results

For worsening prediction: sensitivity 90%, negative predictive value 90%, specificity 60%, positive predictive value 59%. For improving prediction: sensitivity 50%, negative predictive value 87%, specificity 91%, positive predictive value 62%.

Conclusion

According to the sensitivity and negative predictive value for worsening prediction, Biomod-L® seems a reasonably liable tool for detecting slight progressions of the Cobb angle and to be used as a trigger for X-Rays controls.

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