"Age effect on upper limb kinematics assessed by REAplan robot. A prospective study in healthy children from 3 to 12 years old."

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ABSTRACT

Introduction : kinematic assessment is recommended to evaluate upper limb movements quantitatively. The aims of this study were to develop norms of upper limb kinematics for healthy children and to determine the effect of age on kinematic indices. Materials and Methods : ninety-three healthy children (3 to 12 years), participated to the study. Five kinematic indices were computed from two unidirectional (i.e., reaching a target and performing a back-and-forth movement) and two geometrical (i.e., drawing a circle and a square) tasks (1). Each task was performed 10 consecutive times with the REAplan, which is a distal effector robotic device that allows upper limb displacements in the horizontal plane. Results : four indices showed an improvement from 3 to 6 years (p<0.05). Indeed, the straightness and smoothness results were more variable during the 10 cycles of movements and the amplitude of movements was lower in the youngest children than in older children. After 6 years, all indic...

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Oral Communication

Age effect on upper limb kinematics assessed by REAplan robot. A prospective study in healthy children from 3 to 12 years old

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Introduction- Kinematic assessment is recommended to evaluate upper limb movements quantitatively. The aims of this study were to develop norms of upper limb kinematics for healthy children and to determine the effect of age on kinematic indices.

Materials and Methods- Ninety-three healthy children (3 to 12 years), participated to the study. Five kinematic indices were computed from two unidirectional (i.e., reaching a target and performing a back-and-forth movement) and two geometrical (i.e., drawing a circle and a square) tasks (1). Each task was performed 10 consecutive times with the REAplan, which is a distal effector robotic device that allows upper limb displacements in the horizontal plane.

Results- Four indices showed an improvement from 3 to 6 years (p<0.05). Indeed, the straightness and smoothness results were more variable during the 10 cycles of movements and the amplitude of movements was lower in the youngest children than in older children. After 6 years, all indices remained stable.

Conclusion- This study is the first to show an age effect on upper limb kinematics in healthy children. These data are used to establish reference standards in children.

Bibliography

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Keywords : Robotics, Outcome assessment, Biomechanics, Kinematics, Children, Upper extremity