COMPARATIVE STUDY OF POSTURAL RECOGNITION FROM FOUR ACTIGRAPHS DURING ACTIVITIES OF DAILY LIVING.

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Introduction: Ambulatory actigraphy is a simple and objective method for the evaluation of motor activity that is used in several neuropsychiatric disoders such as depression, agitation, apathy, and sleep disorders.

Objective: To evaluate the sensitivity (Se) and specificity (Sp) of actigraphic postural detection versus postural data gathered by observer during multiple guided activities.

Material and methods: A voluntary healthy subject was equipped with different actigraphs (Actiwatch®; MicroMini-Motionlogger®; MotionLog®; Movilis®) then realized multiple guided activities during a 7-hour diurnal period : walking, standing, sitting, decubitus with sleep. Actigraphs were worn on different locations (wrists, thorax, ankles, belt) and two of them included postural recognition in addition to motor activity monitoring. Se and Sp for postural recognition compared to ground-truth were obtained from table of confusion based on raw activity data recordings; error of attribution due to devices is detailed in confusion matrix.

Results: Actigraphy postural recognition is efficient for lying position detection (MotionLog: Se 99% Sp 97%; Movilis: Se 80% Sp 72%). Standing position was mainly recognized as sitting position and therefore actigraphic detection lacks of accuracy for these positions. Walking is detected with 20% error.

Conclusion: Postural actigraphy is efficient for lying position detection and actigraphic postural recognition could improve detection and characterization of nocturnal awakenings and diurnal napping in clinical practice.