GAIT ANALYSIS DURING AN ORIGINAL WALKING TEST: APPLICATION IN FIBROMYALGIA SYNDROME

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Introduction and aim

Gait analysis represents a relevant method to detect walking disorders and to appreciate the effectiveness of treatments. The purpose of this study was to develop an original walking test likely to show abnormal gait. This test could be relevant particularly in patients with pathologies associated to symptoms of physical or mental fatigue and psychomotor slowdown.

Patients and methods

Gait analysis data of 265 healthy volunteers (144 women and 121 men aged 5-83 years, included in nine age groups) were established. Control subjects and patients walked at their comfortable speed down and back along a 40 meters straight corridor. Subjects repeated the way three times corresponding to a total distance of 240 meters.

The gait analysis system used in this study (Locometrix^{TM}) included an acceleration sensor, a recording device and a computer program for processing the acceleration signals. The sensor was incorporated into a semi-elastic belt and placed over the L3-L4 intervertebral space.

A 20-second period of stabilized walking was selected for each of the 6 ways to calculate stride frequency, stride length, stride regularity, step symmetry and medio-lateral, cranio-caudal and antero-posterior activities. The walking speed was measured with electrical photocells.

Results

Good reproducibility of gait analysis (intra-tester, inter-corridor and inter-analysis) was observed: coefficient of variation remained below 10% for walking speed, stride frequency, stride length **(Figure 1)**, stride regularity and below 15% for step symmetry. Normative data and patterns during the 6 ways were established for all variables, age groups and sex. Speed of control subjects began to decrease during the sixth decade in men and the seventh decade in women. Variable of gait measured in FM patients illustrated a major reduction ($p < 0.05$) of speed, stride length **(Figure 1)**, stride regularity and activities (medio-lateral, cranio-caudal and antero-posterior) in comparison with normative data.

Conclusion

Patterns of parameters measured during an original walking test offer relevant perspectives to gait analysis and to track the evolution of gait after treatments in several pathologies. We objectified a major psychomotor slowdown in FM patients. This test could be relevant to track the evolution of symptoms in these patients.

Figure 1: Pattern of stride length during the 6 ways in control and FM subjects.