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原著

脳卒中片麻痺患者の安静立位・歩行時における¥¥腹筋群の筋活動 ---- 表面筋電図を用いて ----

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EMG Activity of the Abdominal Muscles During Standing and Walking in Hemiplegics Patient After Stroke

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Abstract

The purposes of this study were to investigate the electromyographic (EMG) activities of the abdominal muscles during standing and walking and to clarify abdominal muscle function. Twelve hemiplegic patients (67.9±11.1 years) participated in the study. Bipolar surface electrodes were placed on both sides of the rectus abdominis and the oblique abdominis muscles. The EMG and signals from foot sensoors during standing and walking were recorded and analyzed. The EMG raw data were rectified and averaged, and then normalized as a percent of the values obtained during maximum voluntary contractions (%IEMG). The rectus abdominis muscles of the paralyzed

side showed little activity during standing and continuous activity (10.0±12.5 %IEMG) during walking. The oblique abdominis muscles of the paralyzed side showed no activity except in four subjects who showed a little activity during standing and three patterns during walking. The first pattern was a continuous pattern. The second pattern had a peak during the paralyzed side swing phase. The third pattern had a peak during the unparalyzed side swing and stance phase. The oblique abdominis muscles of the paralyzed side showed an activity of 24.7±23.3%IEMG during walking while that of the unparalyzed side was 35.9±30.0%IEMG. These muscle movement patterns during walking, have several causes, including compensation by the unparalyzed side, excess effort by the paralyzed side, spasticity and a combination of these factors.

要 約

本研究の目的は，脳卒中片麻痺患者の歩行時における腹筋群の筋活動パターンと活動量を検討することであった．対象は脳卒中片麻痺患者12名（67.9±11.1歳，男性8名，女性4名）とした．正規化のため，被験者に最大随意収縮を行なわせた後，自由歩行をさせ，同時に左右の腹直筋・腹斜筋群の筋電波形とフットスイッチからの信号を記録した．この信号から各筋の歩行時における筋活動の正規化した積分値（%IEMG）を求めた．その結果，歩行時の腹直筋の筋活動パターンは持続的であった．歩行全周期の筋活動量は，麻痺側が10.0±12.5%IEMG，非麻痺側が4.9±2.2%IEMGであった．一方，歩行時の腹斜筋群の筋活動パターンは，左右腹斜筋群が持続的な筋活動パターン，非麻痺側は持続的であるが麻痺側遊脚期に峰を持つ筋活動パターン，麻痺側は持続的であるが非麻痺側の立脚期と遊脚期それぞれに峰を持つ筋活動パターンに分けられた．歩行全周期の筋活動量は，麻痺側が24.7±23.3%IEMG，非麻痺側が35.9±30.0%IEMGであった．このように筋活動パターンにばらつきや多くの筋活動量を必要とした要因として，下肢筋の麻痺，感覚障害，高次脳機能障害などによる歩行障害に対する非麻痺側の代償運動，麻痺側の過剰努力，連合運動にともなう痙縮などが考えられた．