The Relationship of Symptom to Function Elaborated

In what I consider to be a classic editorial, Landau (1974) argued that it is the negative symptoms (e.g., paresis, loss of dexterity) rather than the positive symptoms (e.g., spasticity with increased reflexes and muscle tone) that are disabling to patients with diagnoses such as stroke. Nevertheless, as Spaulding, Strachota, McPherson, Kuphal, and Ramponi noted in their article "Wrist Muscle Tone and Self-Care Skill in Persons with Hemiparesis" (AJOT, January 1989), negative symptoms appear to remain the target of some therapeutic approaches. The authors' investigation of the relationship between a positive symptom (i.e., wrist muscle tone) and function exemplifies a line of research of great importance to both occupational and physical therapy.

Although I hail the authors' efforts, I would like to correct one of their statements regarding one of my own publications and to respond to their statement that "few studies examine the relationship between muscle tone and function" (p. 11).

The authors cited a paper that a colleague and I wrote in 1985 (Bohannon & Larkin). They inferred that our paper described the use of "torque output during isokinetically controlled movement" to "measure the level of spasticity" (p. 11). We indeed did use an isokinetic dynamometer. Torque output, however, was not measured. Instead, the dynamometer range of motion record was used to document the "joint angle response to a pendulum test" (Spaulding et al., 1989, p. 11). In that respect, our measurement was much like that of Bajd and Bowman (1982).

Concerning the authors' statement that "few studies examine the relationship between muscle tone and function" (p. 11), the relationship between muscle tone and a specific function (gait) has been studied in patients who have had a stroke.

Norton, Bomze, Sahrmann, and Ellisson (1975) reported no significant correlation between spasticity at the knee (as measured by electromyographic responses to stretch) and gait speed. In 1987, I documented no correlation between manually graded resistance to passive stretch and gait speed, cadence, independence, or appearance (Bohannon, 1987). Nakanura, Hosokawa, and Tsuiji (1985) found no significant correlation between the degree of the patellar tendon reflex and gait velocity or cadence. In a study submitted for publication, Andrews and I were unable to verify a significant correlation between the results of a pendulum test on an isokinetic dynamometer and gait speed. Given the studies cited here, increased muscle tone or spasticity (regardless of the method of measurement) appears to lack a significant relationship with gait (regardless of the aspect measured).

The evidence, to which Spaulding et al. have contributed, is mounting. Spasticity, in most cases, may not be so much the enemy as a neutral, albeit sometimes obnoxious, bystander.

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References


Authors’ Response

We appreciate Bohannon’s letter and apologize for misinterpreting and misreporting the methods used in his study.

It is our contention that many studies have indeed been conducted to assess the underlying mechanisms of spasticity and, more recently, the assumption that spasticity is driven by the stretch reflex. Bohannon’s letter illustrates some of the confusion that is problematic in the literature. We have taken the position that hypertonia is not synonymous with spasticity (McPherson, 1981). We agree with Bohannon that the evidence has been mounting that stretch reflex enhancement is not the principal underlying cause of the abnormality seen with brain injury. We also agree with Burke (1988) that elevated levels of intersegmental spinal reflex activity should be considered a positive symptom (consistent with Landau’s [1974] position) rather than a negative symptom. For those persons interested in studies that support this viewpoint, we have supplied a list of related readings. As Katz and Rymer (1989) suggested, hypertonia is one component of upper motor neuron syndrome. Other features include loss of dexterity, weakness, fatigability, and release phenomenon. These other features may be more disabling than hypertonia, as Bohannon suggests in his letter.

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References


Related Readings