
The terms diplegia, quadriplegia, and hemiplegia should be phased out

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SIR—In the June 2010 issue of *Developmental Medicine and Child Neurology*, Michael Shevell presents a thoughtful argument in favor of maintaining the terms diplegia and quadriplegia as descriptions of cerebral palsy (CP).¹ He does not really address the term hemiplegia, and I assume this suggests he feels that term is now safely ensconced in the CP lexicon. I would like to make the argument that all three terms be phased out, particularly in research. They should be replaced by the Gross Motor Function Classification System (GMFCS) and the Manual Ability Classification System which have shown great utility for describing individuals with CP.

First of all, Shevell's definition of diplegia (spasticity of the lower limbs far in excess of any perceptible upper limb involvement) is at odds with the various definitions that have been used historically, as noted in Colver and Sethumadhavan's 2003 article.² The fact that there are various definitions argues strongly for abandoning the use of the term in research. Furthermore, Colver and Sethumadhavan make the point that it is not clear what is meant by 'more involved' and 'less involved.' Is this tone, function, or some other factor? Tone and function can change based on time of day, age, intervention, and other factors, making borderline cases unclassifiable.

Second, there really is no such thing as an uninvolved limb in CP. Studies of individuals with hemiplegia demonstrate marked impairment of movement kinematics in the more affected side. However, the uninvolved side is generally impaired as well, not really matching the performance of normal controls.^{3,4} Because of this, we use the terms 'less affected' arm and 'more affected' arm for an asymmetric patient. Patients with diplegia who truly lack perceptible upper limb involvement are few and far between. In essence, the great majority of patients, if not all, have quadriplegia to some degree.

Finally, Shevell suggests that there is strong correlation between quadriplegia and GMFCS levels IV and V, with diplegia having higher levels. He talks about comorbidities and radiological differences between the two. Based on the several fine articles that have shown the ability of the GMFCS to distinguish children with CP for many characteristics, I would suspect that the GMFCS by itself would also show differences for radiological findings and comorbidities, with much less question as to classification of the participants.

The topological descriptive terms for CP are not completely useless, owing to their familiarity. They are still helpful for clinical communication and for a quick description of a population, perhaps even in the title of a research paper. However, they should be phased out of clinical research and replaced with the more robust classification systems, perhaps with some modifiers to describe limbs involved. Indeed, since in many cases the borderline nature of the involvement brings to mind Lewis Carroll's Humpty Dumpty ('When I use a word ... it means just what I choose it to mean ...'), we should consider coming out of our comfort zones and changing our clinical descriptions as well.

REFERENCES

1. Shevell MI. The terms diplegia and quadriplegia should not be abandoned. *Dev Med Child Neurol* 2010; **52**: 508–9.
2. Colver AF, Sethumadhavan T. The term diplegia should be abandoned. *Arch Dis Child* 2003; **88**: 286–90.
3. Hurvitz EA, Conti GE, Brown SH. Changes in movement characteristics of the spastic upper extremity after botulinum toxin injection. *Arch Phys Med Rehabil* 2003; **84**: 444–54.
4. Brown SH, Lewis CA, McCarthy JM, Doyle ST, Hurvitz EH. The effects of internet-based home training on upper-limb function in adults with cerebral palsy. *J Neurol Rehabil* 2010; **24**: 575–83.