Re: “Upper Limb Neural Tension and Seated Slump Tests: The False Positive Rate Among Healthy Young Adults without Cervical or Lumbar Symptoms”


I t was of great interest that I read the recent article by Davis et al1 which questions the clinical validity of the seated slump test and upper limb neural tension test (median nerve), two commonly used clinical neurodynamic tests1. What ignited my interest was that this study employed a methodology which attempted to determine the ratio of false-positive test findings with definitions that do not adequately reflect the true intention of these neurodynamic tests.

Clinically neurodynamic tests assess the mechanosensitivity of neural tissue2. Neurodynamic tests utilize established sequences of movements to either stress or relieve the nervous system in such a way as to alter, albeit temporarily, the mechanics (i.e. ability of the nerve to withstand compression, glide, stretch) and/or physiology (i.e. localized ischaemia, alterations in intra-neural pressure) of that particular neural tissue3–5. Each test has a number of options of ‘sensitizing movements’ which are a ‘test component that preferably has no direct structural link with the symptomatic area except by means of the nervous system’6. These sensitizing movements therefore attempt to differentiate whether the symptoms that are reproduced during the test are caused by the contralateral limb and as such should not be considered to be indicative of neurodynamic pathology and therefore should not be rated as a positive neurodynamic test. This is in support of the previous definition from Butler3.

Although Davis et al1 have acknowledged the distinction that Shacklock8 makes between an over abnormal neurodynamic response and a normal neurodynamic response, they go onto define a positive test for their study “using structural differentiation as the criterion”9. Essentially the authors are happy to assign a positive finding to a neurodynamic test that shows structural differentiation. It is surprising that, based on this definition of a positive test and given the healthy subject population, the rate of false-positives was not 100% given that normal neurodynamic responses are to be expected when progressive load is imposed on the neural tissues, such as that with neurodynamic testing.

It is vital that the interpretation of neurodynamic testing must take into account the symptoms and presentation of the patient. Many experts in the field of neurodynamics have clearly stated the importance of the reproduction of a person’s symptoms, which implies the presence of pathology3,8,10,11. Therefore clinically, it would be flawed to suggest that a neurodynamic test is to be judged either as positive or negative based on structural differentiation. Unfortunately this is exactly what Davis et al1 have done in defining a positive neural tension test, based solely on structural definition.

The other feature which is vital to the interpretation of any neuromusculoskeletal clinical measure is the comparison between sides (i.e. for neurodynamic testing, comparison between limbs). This study sought only to assess the left side. During neurodynamic assessment no inference can be made as to whether a clinical test is positive or negative unless bilateral comparison is made. This lack of comparison would surely increase the likelihood of a false-positive test for any clinical measure, particularly in light of the fact that healthy subjects were examined. Davis et al1 do acknowledge that this situation is a limitation of the study.

Further to this point, if claims are to be made about the clinical validity or usefulness of neurodynamic tests, then the fact that bilateral comparison was not made should have forced the methodology to be changed to incorporate this very important process. This being the case any claims regarding clinical validity must be debated.

The use of the term false-positive would imply that a clinical test is found to
be positive, thus implicating the presence of a condition or diagnosis, where in fact the condition does not exist. To conduct a study to specifically assess the ratio of false-positive findings for a clinical test in a population of healthy subjects appears to be an unfair witch-hunt. Surely a study conducted to try to establish true-positive results and therefore attest to the strength of clinical validity in a symptomatic group (compared even to a healthy population) would seem a much more robust methodology. With this type of design, the ratio of false-positive rates to true-positive findings could still be assessed.

I think the negative comments that Davis et al make in respect to the clinical validity and usefulness of neurodynamic tests require further debate, especially when the working definition that they have used to judge a positive or negative test is not complete. As a newly emerging field of neuromusculoskeletal therapy, neurodynamics has been associated with many different terms and definitions. Leading authorities, like David Butler and Michael Shacklock actively try to promote clear terms and definitions to avoid confusion for clinicians. This study has the potential to undermine this effort. It is vital that there is a universal adoption of clear and concise terms and definitions within neurodynamics, particularly in respect to interpretation of neurodynamic tests. There is no gold standard measurement or clinical test for neurodynamic dysfunction. In respect to clinical validity or neurodynamic tests, measurement of construct and content validity is perhaps the best assessment available. Clearly more research needs to concentrate on the true underlying physiological and biomechanical underpinnings of neurodynamic pathology before a gold standard measurement exists. While we are waiting, Shacklock’s clinical algorithm presents the most simple and user-friendly method of interpretation or neurodynamic tests.

Richard Ellis, B. Phyt, Post Grad Dip Lecturer
School of Physiotherapy
Auckland University of Technology
Auckland, NZ

REFERENCES