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Abstract: Quantitative Sensory Testing (QST) is a psychophysical method assessing the somatosensory nervous system. A premise for comparable results between laboratories is standardized testing. Its quality can be proven by analyzing healthy subjects, because their results should lie within confidence intervals estimated from large database samples. However, it is unclear how many abnormal values can be tolerated. Based on a binomial distribution, a tool for assessing samples of healthy subjects was developed to detect inclusion errors (inclusion of nonhealthy subjects) or measuring errors (inaccuracies in single QST parameters). Sensitivity and specificity of detecting inclusion errors were assessed in 431 healthy subjects and 833 patients with neuropathic pain syndromes from the German Research Network on Neuropathic Pain (DFNS) database. Measuring errors were simulated by raising all absolute values in a single parameter by 0.5 SD. We calculated optimal cutoff values for group sizes of 16 healthy subjects, as implemented in the DFNS certification procedures. The algorithm was applied in the certification process of 18 European QST laboratories. With a specificity of 95% and a sensitivity of 60%, inclusion errors can be assumed for $\geq 4$ abnormal values per subject.
whereas ≥6 abnormal values per QST parameter and laboratory indicate measuring errors. Subsequently, in the certification process of 5 of 18 centers, inclusion or measuring errors were detected. In most cases, inclusion errors were verified and reasons for measuring errors were illuminated by the centers. This underlines the usefulness and validity of our tool in quality assurance of QST laboratories using the DFNS protocol.