



## Editorial

## The cutaneous silent period: An underutilized tool in clinical neurophysiology

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The cutaneous silent period (CSP) is a transient suppression of the ongoing EMG activity induced by high-intensity stimulation of the sensory nerves. Although the CSP has been mostly studied in the hand muscles after electrical stimulation of the digital nerves, other stimulation paradigms and recording sites have been used. Since the sensory inputs mediating the CSP are conveyed mainly by slow-conducting, A-delta-type nociceptive fibers (Uncini et al., 1991; Leis et al., 1992; Leis 1994), it has been suggested that the CSP may be considered as part of a global nociceptive response that involves also the withdrawal flexor reflex (WFR) (Rossi et al., 2003; Don et al., 2008). Although electrical stimulation can induce a mixture of inhibitory and excitatory responses, the CSP seems to prevail in distal muscles (Eckert et al., 2018), but the WFR in the more proximal ones (Sandrini et al., 2005; Serrao et al., 2001, 2006). Thus, the functional significance of the CSP may be to prepare the limbs to rapidly move away from an offending object by preferentially inhibiting muscles that mediate reaching and grasping (hand muscles), while allowing activation of the proximal muscles that retract the limb (biceps and deltoid).

Since the CSP has been found impaired in several motor control disorders (Pullman et al., 1996; Serrao et al., 2002; Espay et al., 2006; Gilio et al., 2008), it appears conceivable that the interneuronal substrate mediating the CSP represents the final common pathway subserving various aspects of motor control. In this light, the CSP may have two-fold utility: On one hand, as a tool to investigate spinal nociception, on the other hand, as a tool to investigate sensory-motor integration and motor control.

The comprehensive review by Kofler et al. (2019a, 2019b) in this issue of *Clinical Neurophysiology* surveys the literature of the last 25 years on pathophysiological conditions and clinical utility of CSP testing. As underlined by the authors, the potential clinical usefulness of the CSP relies on the possibility to evaluate segments and components of sensory nerves that are not exhaustively assessed by standard electrodiagnostic methods. An interesting result emerging from the present review is that the CSP may have a diagnostic role in the assessment of small fiber neuropathies, in particular the axonal polyneuropathies purely or predominantly affecting small-diameter fibers. Furthermore, among central nervous system diseases, the most useful clinical application of the CSP seems to be the functional diagnostics of intramedullary

lesions, including cervical astrocytoma, syringomyelia and cervical myelopathy.

The CSP has been found abnormal in numerous other diseases involving both the peripheral and central nervous system. However, as stated by the authors, the small population samples and the lack of test-retest reliability represent limitations that will need to be addressed in future studies.

In summary, the CSP is a potentially underutilized tool in clinical neurophysiology. The review by Kofler et al. (2019a, 2019b) is a must read for all those who are interested in extending their diagnostic armamentarium by CSP testing.

#### Conflict of interest

None of the authors have potential conflicts of interest to be disclosed.

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*Accepted 31 January 2019*

*Available online 7 February 2019*