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The definition of sng: The expert consensus by the sng taxonomy Task force of the Taiwan sng Society

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ABSTRACT

“Sng” is a Taiwanese term describing a distinct state of soreness. Accumulating evidence indicates that sng is a specific somatosensory modality, independent of pain, with distinct receptors and transduction pathways. In recent years, variations in its presentation across different medical specialties have highlighted the need for a standardized definition of sng-related terminology. To address this, the Taiwan Sng Society established a multidisciplinary Sng Taxonomy Task Force, comprising 32 experts in both clinical and basic sciences related to sng. Here we summarize the discussions and expert consensus from the Task Force. A total of 16 sng-related terminology was defined. The first edition of sng terminology aims to establish a clear, standardized framework for the clinical practice and research of sng.

1. Introduction

“Sng” is a Taiwanese term that denotes a distinct state of soreness, while “sngception” refers to the somatosensory nervous system’s response to tissue acidosis [1]. Accumulating evidence from both basic research and clinical observations has demonstrated, since 2018, that sng has distinct receptors and transduction pathways separate from pain [2–13]. The clinical manifestations of sng are diverse and span multiple disciplines. It is a specific sensation that can present as soreness or aching (e.g., delayed-onset muscle soreness, statin-induced myalgia, and computer vision syndrome), morbid soreness (e.g., myofascial pain, fibromyalgia), heaviness (e.g., acupuncture in Chinese medicine), or tightness (e.g., degenerative spine diseases) (Table 1). Given the wide range of clinical presentations and underlying pathophysiology of sng, a set of related terms has emerged. Consequently, an expert consensus is needed to establish clear definitions for sng-associated terminology, ensuring consistency in neuroscience research and clinical practice (see Table 2).

To establish standardized terminology for sng, the Taiwan Sng Society formed the Sng Taxonomy Task Force (STTF), consisting of 32 experts from diverse fields, including anesthesiology, dentistry, dermatology, gastroenterology, linguistics, neurobiology, neurology, neurosurgery, nursing, ophthalmology, philosophy, psychiatry, and rheumatology [16] (Appendix 1). The primary objectives of this study were to develop a taxonomy of sng based on existing literature and to define its terminology through expert consensus.

2. Method

The Sng Taxonomy Task Force (STTF) of the Taiwan Sng Society met for the first time on Feb 8, 2025 at TaiChung, Taiwan. A steering committee (Der-Sheng Han, Jiann-Her Lin, Chih-Hsien Hung, and Shu-Pin Huang) prepared the draft of sng-related terminology based on scientific background and literature review. The first meeting of the STTF aimed to achieve consensus on the definition of sng-related terms.

2.1. Preconference survey

To facilitate the discussion during the consensus conference, the steering committee conducted preconference surveys based on previous literature [17–21]. An online discussion within the steering committee was performed and the Sng Taxonomy was drafted for consensus conference.

2.2. Consensus conference

All members of the STTF were invited to participate in a consensus conference aimed at defining terminology related to sng. The meeting began with participant introductions, followed by opening remarks from Professor Wei-Zen Sun, former director of the Department of Anesthesiology at National Taiwan University Hospital, who chaired the conference. Professor Chih-Chen Cheng, the president of the Taiwan Sng Society, then provided an overview of sng’s development. The discussion proceeded with an open forum and voting process to establish consensus on terminology definitions. The consensus was defined as approval by more than 50 % of attendees. If consensus was not reached, further discussion and revisions were conducted, followed by a second vote.

¹ These authors contributed equally.

3. Result

The steering committee identified 16 sng-related terminology, based on the Pain Terms from the International Association for the Study of Pain [22]. These definitions were discussed during the consensus conference, and the final version is as follows.

3.1. Sng

Definition: An unpleasant sensory and emotional experience, primarily or partially associated with, or resembling that associated with, acid-like sensation that often evokes a motivation to take active relief efforts.

Note: Sng, pronounced as/səŋ/, is the Romanization of Taiwanese word “酸” or “痠”. Sng is always subjective and can be known as soreness or ache in the context of exercise-induced muscle discomfort [23]. However, sng is different from soreness or ache in many therapeutic procedures (e.g., acupuncture, prolotherapy, immunization, etc.), as well as in disease states such as fibromyalgia, degenerative spine diseases, infection, etc.

3.2. Sngception

Definition: The neural process of encoding sngceptive stimuli.

Note: Consequences of encoding may be a muscle twitch (via proprioceptive reflex) or a motivation to evoke active-relieving behaviors.

3.3. Sngceptor

Definition: An acid-sensitive sensory receptor of the peripheral somatosensory nervous system that is capable of transducing and encoding sngceptive stimuli.

3.4. Sngceptive stimulus

Definition: An acidic or mechanical event transduced and encoded by sngceptors.

3.5. Sngceptive neuron

Definition: A central or peripheral neuron of the somatosensory nervous system that is capable of encoding sngceptive stimuli.

3.6. Sng threshold

Definition: The minimum intensity of a stimulus that is perceived as sngful.

Table 1 Clinical presentation of sng.

	Diseases/procedure	Trigger	Transducer	Sng Prevalence
Dentistry	Temporomandibular disorders	Overuse of masticatory muscles, oral parafunction		22 % [14]
Dermatology	Herpes Zoster	Virus infection		50 %
Metabolism	Statin-induced myalgia	Statin		
Neurology	Diabetes	Proprioceptor neuropathy		
	Headache/Migraine			
Neurosurgeon	Degenerative spine diseases			80 % [9]
Ophthalmology	Computer vision syndrome	Prolonged digital screen use		
Physical medicine and Rehabilitation	Prolotherapy	Glucose	ASIC1a	
	Therapeutic ultrasound	Mechanical wave	ASIC3	
	Low level laser therapy	Heat	TRPV1	
	Delayed onset muscle soreness	Strenuous exercise	ASICs	
Psychiatry	Depressive and anxiety disorders	Psychological distress and perception disturbances		>50 %
Rheumatology	Fibromyalgia	LPC16:0	ASIC3	>90 % [12,15]
Traditional Chinese medicine	Acupuncture	Manual needling		>90 %

Table 2 Sng classification in clinical scenarios.

	Sngceptive	Inflammatory	Neuropathic	Sngplastic
Acupuncture	V			
Prolotherapy	V			
Delayed onset muscle soreness	V			
Statin myalgia	V			
Arthritis, myositis, Enthesitis		V		
Vaccination		V		
Flu		V		
Chronic post-surgical pain (lumbar spine surgery)	V	V	V	V
Post-herpetic neuralgia			V	
Diabetic neuropathy			V	
Fibromyalgia				V
Temporomandibular disorders				V
Headache/migraine				V
Depression and anxiety disorders				V
Long COVID				V

3.7. Sng tolerance level

Definition: The maximum intensity of a sng-producing stimulus that a subject is willing to accept in a given situation.

3.8. Sngceptive asthenia

Definition: Sngception-evoked fatigue or muscle weakness.

3.9. Sngceptive sng

Definition: Sng that arises from tissue acidosis or mechanical stimuli to sngceptors.

Note: This term is designed to contrast with neuropathic sng. The term is used to describe sng occurring with a normally functioning somatosensory nervous system to contrast with abnormal function seen in neuropathic sng.

3.10. Inflammatory sng

Definition: Sng caused by inflammation.

3.11. Neuropathic sng

Definition: Sng caused by direct damage to sngceptive nerves.

3.12. *Sngplastic sng*

Definition: Sng arising from altered sngception without evidence of tissue or somatosensory damage.

3.13. *Allosngsia*

Definition: Sng due to a stimulus that does not normally evoke sng. It is important to recognize that allosngsia involves a change in the quality of a sensation, whether tactile, thermal, or of any other sort. The original modality is normally non-sngful, but the response is sngful.

3.14. *Asngsia*

Definition: Absence of sng in response to stimulus which would normally be sngful.

3.15. *Hypersngsia*

Definition: An augmented sng response to a regular sngceptive stimulus.

3.16. *Hyposngsia*

Definition: A diminished sng response to a regular sngceptive stimulus.

4. Discussion

In this consensus conference, a set of novel sng-related terms was developed and agreed among experts in the Task Force. These new definitions not only clarify that the expert group considers sng as an independent somatosensory modality from pain, but also provides implications for potential pathophysiology of sng.

The somatosensory experience of discomfort associated with acid-like sensation demands a precise definition—one that distinguishes it from garden-variety aches, soreness, and pains and pins down its signature qualities. A term *sngception* is coined to capture this distinctive sensory experience [1]. The word is composed of *sng*, drawn from the Southern Min Chinese *sng* 酸 (“sour taste,” IPA [səŋ])—which later gave rise to *sng* 痠, denoting the very bodily distress under discussion—with PIE root *kap-, meaning “to grasp” as in *conception* and *perception* [23]. By carving out this niche, *sngception* grants linguistic clarity to an experience of discomfort that has long lurked in the shadows of broader pain taxonomies.

In English, “sore” is a similar term, which express “emotional pain or distress, physically tender (as from overuse or injury)” by the Merriam-Webster Dictionary, or “painful and uncomfortable because of injury, infection, or too much use” by the Cambridge Dictionary. However, sng is a synthesis of sensation, which may comprise soreness/aching (delayed onset muscle soreness), morbid soreness (myofascial pain, fibromyalgia), heaviness (acupuncture), and tightness (lumbar stenosis). Thus, a set of novel terminology was coined/developed for a more precise description of symptoms and classifications.

Sng is a multifaceted pathophysiological phenomenon and involves various mechanisms [5]. Sng can be classified into numerous distinct categories according to their underlying pathophysiological mechanisms and clinical manifestations.

Sngceptive sng arises from acid-mediated or acid-like sensing process via direct activation of sngceptors [5,8]. Its triggers can be chemical stimuli, mechanical stimuli, or a combination of both. Primary afferent fibers, including proprioceptors (A α and/or A β fibers), transmit signals via the dorsal column of the spinal cord to the brain, leading to the perception of sngceptive sng [8]. A very common life experience of this type of sng is delayed onset muscle soreness and acute exertional soreness. Another clinical example is sng induced by acupuncture or

prolotherapy, which results from mechanical stimulation during the procedures [3,24]. Statin-induced musculoskeletal discomfort is also classified as sngceptive sng.

Neuropathic sng is another common type of sng. Like neuropathic pain [25], neuropathic sng results from nervous system damage or dysfunction in either the peripheral or central nervous system. Damage to the nerve system leads to maladaptive sng modulation and dysfunction of sng gating pathways, thus resulting in increased excitability of sng perception and exaggerating sng responses. Neuropathic sng may involve abnormal sensory sensations, like allosngia and hypersngia. Clinical examples of this type of sng include diabetic neuropathy-related sng, post-herpetic neuropathic sng and post-stroke sng.

Inflammatory sng occurs due to an inflammatory response following immune system activation inflicted by infection or tissue injury [26]. The trigger of inflammatory sng is associated with the release of inflammatory mediators, thus resulting in increased sensitivity to both harmful and non-harmful stimuli and exaggerating sng perception. Inflammatory sng is commonly accompanied by co-existing inflammatory reactions, such as swelling, redness, and heat over the lesion sites. Like the temporary nature of inflammatory responses, inflammatory sng is usually transient. However, in the conditions of chronic inflammatory disease, inflammatory sng can become chronic due to sustained immune responses. Inflammatory sng can be observed in vaccination, virus infection (e.g., flu, COVID-19), and autoimmune diseases, like rheumatoid arthritis and myositis.

Sngplastic sng occurs after altered sng processing without evidence of nerve injury or tissue damage [5,27]. The development of sngplastic sng commonly involves sensitization of sng pathways within the PNS and/or CNS. The distribution of sngplastic sng is often widespread and diffused rather than localized pattern. Like nociplastic pain, sngplastic sng commonly involves hypersensitivity to various stimuli, such as thermal, mechanical, sound, visual, olfactory stimulation, or even psychological distress. Just like pain, sngplastic sng is very common in conditions like fibromyalgia [15,28,29] and psychiatric disorders [30].

The pathological state of *sng*, which we propose to call *sngsia*, combines *sng* with the suffix *-ia*, a Greek noun-forming elements in the names of diseases, countries, and flowers, as in *hyperthermia*. But rather than the unwieldy *sng-ia*, we settled on *sngs-ia*, by slipping in an *s* for easier articulation. The rationale is that most Indo-European languages lack words that begin with nasal velar consonant [ŋ], making [ŋɪa] mouthful, if not outright unpronounceable. The inserted *s* serves as an articulatory connector, and similar alternations can also be found in existing medical terms like *analges-ia*, as opposed to *anal-g-ia*.

Sngceptive asthenia captures a peculiar form of weakness triggered by sngception, a phenomenon distinct enough to warrant an independent entry in the taxonomy. While *sng* often overlaps with pain, the sensation of muscular frailty or stiffness sets it apart [31]. In Mandarin Chinese and Southern Min Chinese, this experience is expressed in compound 痠軟 “sng-weak.” In the Chinese Suggested Upper Merged Ontology (Chinese SUMO), this domain is labeled as “paralysis” and is not overlapped with pain-related expressions, which reinforces the idea that sngception is uniquely tied to muscle weakness. But paralysis was too strong a word. Unlike true paralysis, which signals a total shutdown of motor function, *sng* describes a more subtle depletion of muscular strength. Another term *asthenia* is therefore postulated in *sng* taxonomy. Meanwhile, a related term *asthenopia* has already embedded in ophthalmology discourse, where it denotes fatigue of the rectus and pupillary muscles responsible for eye movement and focus [32,33]. The term *asthenia* not only preserves linguistic precision but also integrates *sngceptive asthenia* into a broader medical lexicon, making it a more intuitive fit for describing similar bodily sensations.

We acknowledge that there are still open issues related to the terminology of sng. However, although the terminology might be imperfect or provisional, we still need it for more precise description in this field. Future revisions are warranted when more research evidence is available.

5. Conclusion

The first consensus conference of the Sng Taxonomy Task Force provided a simple and consistent definition and terminology of sng, which should be implemented in the future to harmonize communication in the clinical practice and scientific research. We hope the Sng Taxonomy will facilitate the advancement in the field of sng study, and the development in related new diagnosis and treatment.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Dr. Wei-Zen Sun (孫維仁教授) is the corresponding author for this manuscript and serves as an Executive Editor for the Journal of the Formosan Medical Association. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix 1

The chair and vice-chair of sng taxonomy Task force are Wei-Zen Sun and Chih-Cheng Chen. The remaining members include Jen-Yin Chen (anesthesiologist), Yung-Hsiao Chiang (neurosurgeon), Hsiao-Yean Chiu (nurse), Li-Wei Chou (physiatrist and Chinese Medicine), Der-Sheng Han (physiatrist), Cheng-Ta Hsieh (neurosurgeon), Sung-Tsang Hsieh (neurologist), Ming-Chyi Huang (psychiatrist), Shuping Huang (linguist), Wei-Lieh Huang (psychiatrist), Chih-Hsien Hung (neurologist), Jiunn-Horng Kang (physiatrist), Hsun-Hua Lee (neurologist), Chia-Shu Lin (dentist), Chien-Min Lin (neurosurgeon), Chih-Peng Lin (anesthesiologist), Jiann-Her Lin (neurosurgeon), Ying-Tung Lin (philosopher), Yen-Chin Liu (neurologist), Long-Sun Ro (neurologist), Chiung-Chyi Shen (neurosurgeon), Lily I-Wen Su (linguist), Yu-Jih Su (rheumatologist), Jui-Ming Sun (neurosurgeon), Jia-Ying Sung (neurologist), Rong-Kung Tsai (ophthalmologist), Shuu-Jiun Wang (neurologist), Man-Ling Wang (anesthesiologist), Yeong-Ray Wen (anesthesiologist), Hao-Jui Weng (dermatologist), Ming-Shun Wu (gastroenterologist and Chinese Medicine), Yu-Wen Yu (neurobiologist), in the alphabetical order of their surnames.

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