

World Journal of *Clinical Cases*

World J Clin Cases 2022 September 26; 10(27): 9550-9969



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The WJCC is now abstracted and indexed in Science Citation Index Expanded (SCIE, also known as SciSearch®), Journal Citation Reports/Science Edition, Current Contents®/Clinical Medicine, PubMed, PubMed Central, Scopus, Reference Citation Analysis, China National Knowledge Infrastructure, China Science and Technology Journal Database, and Superstar Journals Database. The 2022 Edition of Journal Citation Reports® cites the 2021 impact factor (IF) for WJCC as 1.534; IF without journal self cites: 1.491; 5-year IF: 1.599; Journal Citation Indicator: 0.28; Ranking: 135 among 172 journals in medicine, general and internal; and Quartile category: Q4. The WJCC's CiteScore for 2021 is 1.2 and Scopus CiteScore rank 2021: General Medicine is 443/826.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: *Ying-Yi Yuan*; Production Department Director: *Xiang Li*; Editorial Office Director: *Jin-Lei Wang*.

NAME OF JOURNAL

World Journal of Clinical Cases

ISSN

ISSN 2307-8960 (online)

LAUNCH DATE

April 16, 2013

FREQUENCY

Thrice Monthly

EDITORS-IN-CHIEF

Bao-Gan Peng, Jerzy Tadeusz Chudek, George Kontogeorgos, Maurizio Serati, Ja Hyeon Ku

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

PUBLICATION DATE

September 26, 2022

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INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/GerInfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/GerInfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/GerInfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Psychiatric disorders and pain: The recurrence of a comorbidity

Gentian Vyshka

Specialty type: Neurosciences

Provenance and peer review:

Invited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's scientific quality classification

Grade A (Excellent): A

Grade B (Very good): 0

Grade C (Good): C

Grade D (Fair): D

Grade E (Poor): 0

P-Reviewer: Cristaldi PMF, Italy; Pitton Rissardo J, Brazil; Sultan AAEA, Egypt

Received: May 8, 2022

Peer-review started: May 8, 2022

First decision: June 2, 2022

Revised: June 12, 2022

Accepted: August 16, 2022

Article in press: August 16, 2022

Published online: September 26, 2022



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Abstract

Painful conditions are probably among the most frequent reasons for seeking medical advice and assistance. Although pain is a common complaint among psychiatric patients, clinicians generally separate its presence from the background mental disorder and downplay its importance, trying primarily to control the psychiatric symptomatology. As a sensory modality, the presence of pain and its importance account for an impressive body of scholarly research. Cartesian methodology considered sensations of all modalities in a mechanistic form, which actually sounds obsolete. However, authors have continuously been faced with the same dilemmas plaguing scholars for centuries. We assume that a large portion of the sensory inputs might be generators of distorted perceptions, which subsequently lead to psychopathology. Auditory and visual hallucinations are incontestable examples. Somaesthetic hallucinations also exist, but pain hardly deserves such a denomination. Nevertheless, chronic pain and psychiatric comorbidity is a reality that needs explanation. Painkillers are not effective in treating psychiatric disorders, and antipsychotics do very little, perhaps nothing, to relieve pain. The pharmacological approach opens one door on the horizon and closes many others, while clinicians continue to face a high prevalence of comorbid pain and mental health issues. However, attempts to correlate altered body schemata (as distorted as it may be, for example, in phantom limb pain) with somatic delusions can simplify all these dilemmas, and the basket of psychophysiology, in fact, might be bigger than presumed.

Key Words: Pain; Sensory processing; Psychiatry; Nervous system; Sensitization

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Core Tip: Chronic pain and psychiatric disorders concur often and the prevalence of this comorbidity outnumbers the odds of a mere coincidence. Identifying the first causative factor will be difficult, especially when the situation is complex and therapies have given poor results, if not failed completely. The debatable question of which comes first: The psychiatric disorder or the painful injury, nevertheless can be simplified within the model of a central sensitization, seemingly upheld from the model of PTSD and similar medical occurrences. Thus, an initial injury of psychological nature could lower pain perception threshold, and lead subsequently to chronic pain disorders.

Citation: Vyshka G. Psychiatric disorders and pain: The recurrence of a comorbidity. *World J Clin Cases* 2022; 10(27): 9550-9555

URL: <https://www.wjgnet.com/2307-8960/full/v10/i27/9550.htm>

DOI: <https://dx.doi.org/10.12998/wjcc.v10.i27.9550>

INTRODUCTION

Pain description: A brief historical approach

Narratives of pain are impressively diverse and cover a time span that crosses centuries of written history. Greek mythology is rich in examples, and the etymology of the word pain—derived from *poena* for punishment—speaks volumes about the way humans perceive the sensation. That Zeus was said to suffer from a tremendous headache to the point of shouting in a loud cry for help and that Hephaestus relieved such pain by opening Zeus's skull with a wedge might be proof that neurosurgery itself existed long before we might have believed[1,2].

Primitive and survival-related sensations, such as painful sensations, have inspired works of art and led to doctors and ancient healers offering detailed descriptions[3]. The Homeric epos and Dante's *Inferno*, separated by an interval of two millennia, are full of painful impressions that might look spiritual but are as somatic and embodied as any description[4,5].

Renowned philosophers have meditated on, worked with and written upon sensory modalities and sensory processing in humans. The pioneering Cartesian ideas in the *Traité de l'homme* (published 1664) served for decades, if not centuries, as a mechanistic explanation and approach to the highly complicated explanations provided for human senses. Of course, pain and painful stimuli were the most elaborately discussed. René Descartes (1596-1650) accurately envisaged the ascending pathways leading this perceptive product towards the cortex, although he could clearly not explain the electrical nature of the signaling messages. Well before microscopy and sophisticated imaging, he was able to separate the processing of the touch (*attouchement*) from that of the pain (*douleur*); looking ahead, he even denoted a diversity of the latter while talking about tickling (*chatouillement*)[6].

There can be hardly a more famous image in the field of medicine than the unknown human, experiencing thermal pain while withdrawing the foot from the fire heat (perhaps competing only with Da Vinci's *Vitruvian man*); the mechanistic theories of Descartes expanded across the entirety of human sensations and were not limited to only thermalgesia.

Long before the understanding of action potentials and of the role of the spinothalamic tract in the transmission of pain perception, Descartes clearly identified that sensations travel dorsally in neural structures towards the brain[6].

Of course, Cartesian methodology and mechanistic analyses were a major step forward in science, especially in the field of sensation physiology across all of its modalities[7]. The threads of Descartes would eventually become wires once the understanding of electricity was completed one century after his pioneering explanations of anatomy and physiology. Benjamin Franklin (1706-1790), whose interest in medicine was impressive, is given the laurels of explaining electrical impulses in a field where the contributions of other scholars were numerous and important[8]. Other pioneers of neuroanatomy would strive unrelentingly to differentiate ascending and descending tracts travelling inside the spinal cord, and many clarifications of these notions were obtained around the beginning of the twentieth century: Edinger, Gowers, Mott, Dejerine and others conducted such work[9]. The implications for clinical practice and pain relief were impressive, with neurosurgeons (Spiller, Martin, and Schüller) starting to perform cuts or section parts of the spinal cord to relieve intractable pain[10].

Huxley and Hodgkin translated these important anatomic and physical advancements into human physiology in 1952 after recording and explaining the action potential in the giant squid axon[11]. However, science as a whole, and medicine in particular, has been striving—as it continues to do today—to provide a unique sense or explanation for pain and to locate a specific (single or multiple) cortical area whose attributes correspond to nothing but feeling pain.

CLASSIFICATIONS: WORDS ARE NEVER ENOUGH

There are as well hermeneutical issues while approaching pain: Mostly, or exclusively, clinicians rely on the patients' words. Behavioral expressions and modifications, or autonomous signs, are inconsistent and not systematically classified. Visual Analogue Scale that is largely applied remains a subjective measuring of what a patient is feeling and perceiving – even the denomination *patient* derives from the Latin '*pator*', suffering[12].

Aware of such an issue, scholars and associations have been working on formulating a framework, guidelines or an ad hoc vocabulary. International association for the study of pain (IASP) agreed on a basic pain terminology in 2007: The Kyoto Protocol (the disambiguation has nothing to do with the famous homonymous protocol on the climate change...)[13].

The Protocol included in the taxonomy the following terms, enlarging notably the word vocabulary in the field of pain studies: Pain; Noxious stimulus; Nociceptor; Nociceptive neuron; Nociception; Nociceptive stimulus; Nociceptive pain; Neuropathic pain; Peripheral neuropathic pain; Central neuropathic pain; Sensitization; Peripheral sensitization; Central sensitization; Allodynia; Hyperalgesia; Pain threshold; Pain tolerance level.

This impressive work of Loeser & Treede and the definition of 17 basic terms is of particular importance for scholars working in the field of neuropathies and other adjacent areas of study. That pain might exist in the absence of nociception is not as well a brand new idea; yet Loeser in another paper details several conditions of pain syndromes without nociception (thalamic syndrome; tic douloureux; postherpetic neuralgia; phantom limb pain and nerve-root avulsion pain; among other) [14]. So far, a direct link with psychiatry seems hard to find, as the notion of *mental pain*, albeit available and circulating, has not yet full citizenship among neurologists and anesthesiologists[15].

Of course, IASP drafted this terminology for specialists of the field. Things are substantially different while talking with patients – even more when deeply suffering – or with nonprofessionals. Melzack, who introduced the gate control theory of pain, proposed and applied a detailed questionnaire with scores of terms that will describe painful sensations in their variegated panoply[16,17]. The widely used McGill pain questionnaire in its second part starts with the question *what does your pain feel like?* Twenty subgroups of terms follow, each composed from a minimum of two up to a maximum of six words close to the meaning of each other as similarly as synonyms. The questionnaire has the specific purpose of giving voice to the painful patient, to better formulate his feelings and perception, a duty as hard as it can be. In a dedicated work of comparing McGill pain questionnaire wordings with the vocabulary of *Inferno*, some scholars have documented the ability of the Dantesque universe to elaborate – maybe even more deeply – in words what a feeling of pain might be[18].

NEUROPHYSIOLOGY: WELL BEYOND ANTHROPOLOGY

Terminology was not the only weakness that pain theories were trying to handle. Downplaying the evolutionary aspects has caused more confusion than misunderstanding: nociception is obviously not the same perceptive product as the pain. Mental pain is debatable, but nociception seems as primitive as it can be; even small species must avoid thermic and noxious stimuli, to ensure survival. Pain is cortical – or at least subcortical – although recently proof of peripheral origin of certain types of pain became available[19].

As such, primates and other species elaborate pain much more than nociception, to the point that pain became an independent phenomenology. *An emotional experience* is the pain definition for most sources; and emotions will lead beyond doubts to the psyche, psychology and psychiatry.

The Cartesian idea of something 'broken apart' that will produce pain was probably not brand new neither a forgotten one. *Fractals* (from Latin *fract-*, broken) are a debatable theme in neurosciences and medicine[20]. Mechanistic approaches to continuous pain in complex models of dynamics and fractal dimensions are described[21]. If nociception is not the same as pain, can we explain this within the analogue – binary information system? Small and unmyelinated C fibers, as well as A-delta fibers, transmit through a decremental conduction that is quite more noticeable than among proprioceptive A-beta fibers[22]. Hence probably, the difference in the peripheral processing of thermalgesia from proprioception. If the small and unmyelinated fibers do not follow the all-or-nothing rule, than peripheral processing of painful stimuli is analogue. The unresolved mystery of the central pathways whose center and *modus operandi* remains effective.

We impute that a large part of the sensorial inputs might be generators of distortive perception, thus leading to psychopathology. Auditory and visual hallucinations are incontestable examples. Somesthetic hallucinations do exist as well; but pain hardly deserves such a denomination[23].

Nevertheless, chronic pain and psychiatric comorbidity is a reality that needs explanation. It remains still the conundrum or the disagreement between neurophysiology standing (which requires tissue damage/inflammation as a pain starter) and the other approach, a mixture of psychiatry and anthropology[24]. As long as we talk about a mental/emotional pain (explicitly, thus not mere suffering, but pain) than the anatomical construct *C fibers – dorsal root ganglion – spinothalamic tract* and what follows

cortically would be under continuous revision.

PAINKILLERS NOT DESERVING THIS NAME: PAIN RESURRECTION

Painkillers are of no profit in psychiatry; and antipsychotics do very little, if nothing, to relieve pain. Deserving the name – which in fact is mostly of use within nonprofessionals' everyday vocabulary – would implicate the patient becoming forever free from pain. Instead, and hence the definition, chronic pain turns and returns back repeatedly. A vicious circle of painkillers use and abuse, with periods free from pain, and recurrent painful periods, will cause very much of distress to patients[25]. Addiction and dependence from analgesics is therefore more a rule, than an exception.

The pharmacological approach opens a horizon and closes many others, while clinicians still face a high prevalence of co-morbid existence of pain and mental health issues. This might not be a mere curiosity or a cultural rarity, which in fact, do exist[26].

There have been systematic and serious attempts to clarify the alleged high prevalence of pain and psychiatric disorders' comorbidity[27]. Obviously, suffering from a chronic medical condition – chronic pain fully deserves this status – will lead to a depressive mood, if not to a major depression. It is still hard to identify the *primum movens*: Is it the pain causing depression; or depression itself causes somatic pain[28]. We should consider, nevertheless, that many chronic painful diseases (rheumatic disorders *etc.*) will not necessarily and straightforward cause depression. Almost half of patients with depression count pain among their symptoms[29,30]. Although controversial and contradicted as it might be, antidepressants (mainly tricyclics) seem to have some intrinsic analgesic ability[31,32].

However, attempts to correlate altered body schemata (as lost as it can be, for example, in phantom limb pain) with somatic delusions can simplify all dilemmas: the basket of psychophysiology, in fact, might be bigger than presumed.

CONCLUSION

Concurrence of pain and psychiatric disorders

There must be a link between psyche and pain sensation, as remote as humanity itself. However, the double-sided connection between psychiatric disorders as causing (more) pain, and chronic pain as leading to mental health issues secondarily, needs some clarifications.

That some people are more prone to enhanced painful sensations is a known concept, and has lead even to diagnostic challenges: just recall da Costa syndrome and chest pain[33]. A lot of work focuses on childhood traumatic experiences, post-traumatic stress disorder and belated pain disorders of adulthood[34,35].

It seems therefore, that the primacy of an early mental injury, will define someone's ways of perceiving and coping with pain. The occurrence might be even *sine materia* one, with no way to objectify complaints, such as the somatic symptom and related disorders: This is a diagnostic notion well defined in several psychiatric manuals and classifications[36].

Obviously, the most important bulk of studies in the field focuses on depression, depressive disorders and subsequent pain conditions. Psychopharmacology has granted a sound substrate to the discussion. If antipsychotics do little, if nothing, to alleviate pain, the same is not true for antidepressants. Tricyclics (amitriptyline and others, to mention a few) seem to be useful in chronic pain and their efficacy, although debatable, has warranted their long-term use, even among non-adults[37,38].

The discussion related to what comes first: Chronic pain, or the psychiatric disorder, while these diagnoses concur inside the clinical picture of the same patient, and do so for a long time, might be not merely of theoretical value. The primacy of a first central (cortical) nervous injury is crystal-clear in the case of a posttraumatic stress disorder. There is a significant connection between posttraumatic stress disorder, central sensitization and subsequent chronic pain[39,40]. Since the initial insult could have been the psychic trauma itself, then we need to frame our diagnostic approach accordingly. Here including, the pharmacological treatment of the pain in its diversity of forms.

FOOTNOTES

Author contributions: Vyshka G has conceived and written the manuscript; revised it in the present version, and collected the references.

Conflict-of-interest statement: All authors declare no conflict of interests.

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Country/Territory of origin: Albania

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S-Editor: Liu JH

L-Editor: A

P-Editor: Liu JH

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