



Case Report

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Analgesia During COVID-19 Infection, a Case Report and Review of the Literature

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Abstract

SARS-CoV-2 infection most commonly presents with an acute pulmonary distress syndrome, however neurological complications such as stroke, Guillain-Barré syndrome, headaches, smell and taste abnormalities are also frequently seen. We present a 44-year-old female with a chronic painful dermatomyositis who developed generalized analgesia with complete pain resolution while being infected with the COVID-19 infection. The analgesic effect lasted for three months and slowly dissipated during the post-infection period. This is the first case of generalized chronic pain blunting in a woman with painful myopathy in the context of COVID19 illness.

Keywords: SARS-Cov-2, COVID-19, Pain, Myopathy, Analgesia

Introduction

The COVID-19 pandemic was primary characterized with an acute respiratory syndrome, however neurological complications such as anosmia, headaches and others are common [1-3]. However, transient hypoalgesia or analgesia during a SARS-CoV-2 infection are hardly ever reported [3]. We described a woman disabled by a chronic painful dermatomyositis refractory to therapy who developed a generalized anesthesia during a SARS-CoV-2 infection that slowly resolved months after the resolution of the viral illness. We also discuss the meager literature about COVID-19-related analgesia in other painful disorders.

Case Presentation

A 44-year-old female with chronic painful dermatomyositis who presented herself into the Emergency Department one morning when she woke up with no more diffuse body achiness, but with anosmia and ageusia. She tested positive for SARS-CoV-2. She denied symptoms of upper respiratory infection, cough, dyspnea,

fever, chills, chest pain, abdominal pain, nausea, vomiting, diarrhea, and headaches. Her painful dermatomyositis was characterized by a diffuse myalgias affecting her body, especially upper and lower limbs. She was refractory to several analgesic medications including gabapentin, pregabalin, tricyclics, and baclofen. Her general and neurological examination was unremarkable, except for a sensory exam that revealed absent pinprick and temperature loss in upper extremities. Lab was unremarkable for anti-acetylcholine antibodies and anti-MUSK antibodies, myositis-related antibodies, paraneoplastic panel, CK/Aldolase, CRP, complete metabolic and rheumatic panel. Brain imaging was deemed unnecessary. The generalized analgesia, anosmia and ageusia started to dissipate into the third month post infection period with resumption of myalgias and for the fifth month she was back to the pre-infection state.

Discussion

We describe a woman with a chronic painful dermatomyositis who became pain free during COVID-19 illness and postinfectious



period. This represents the first woman with blunting in pain during a SARS-CoV-2 infection. There are six prior cases in English, all men and refractory to pain therapy with a significant pain improvement during a COVID-19 infection.

The first case, a 49-years old male with refractory neuropathic pain in his legs, especially at night, caused by a motor vehicle accident with multiple vertebral fractures, who experienced a dramatic pain improvement during COVID infection that present with headaches and fatigue; as the infection resolved his pain resumed [4]. The second case was a 70-years-old male chronic refractory back pain that resolved during a COVID infection that required hospitalization due to severe hypoxia, but with no discomfort or dyspnea. His refractory chronic back pain resolved during the viral infections. His clinical features resumed a month later [5]. A case series of three terminal cancer patients refractory to pain therapy developed analgesia or hypoalgesia surrounding a COVID infection: a 84-year-old-male with a neuroendocrine carcinoma and severe lumbar pain due to peri-vertebral bone metastasis who did not required

any longer opioids during the viral infection; a 68-year-old-man with chest pain related to bilateral rib metastases who became pain free during a COVID 19 infection with fever and coughing and a 67-year-old man with bladder adenocarcinoma with neoplastic infiltration of the rectum with excruciating pain, especially while defecating. During COVID illness he developed coughing, fatigue, fever and hypoxemia, however his pain dramatically resolved only having minimal pain while defecating. A month later his rectal pain reappeared as his viral infection cleared. All died soon after, but none had serious cognitive issues to invalidate their pain self-report [1]. The last case was a 48-year-old man who during a COVID illness with mild flu-symptoms, severe anosmia, ageusia and bilateral leg sensory loss had no pain after a right knee surgery, even during physical therapy. The COVID-illness lasted a month, but most of his neurological symptoms continued progressively resolving after a year [6]. The intraepithelial nerve density displayed a reduction of nerve fibers in the distal leg skin. Table 1 showed summary of all these cases.

Table 1: Main features of patients with COVID-related analgesia.

Patient No	Demographic	Pain Characteristics	Comorbidities	COVID Symptoms	Pain score	Outcome
1	49-year-old male	Constant neuropathic burning pain in his legs that affect his sleep	MVA with several vertebral fractures	Fatigue and debilitating headaches	Pain went from intense to minimal or no pain	Pain resumed when COVID resolved
2	70-year-old male	Blunted whole body pain perception without modification of temperature sensibility	Significant improvement of his chronic back pain	He had to stop for breathing when walking, but no dyspnea	Pain resolution	Pain slowly resume a month later as he recovered from COVID infection
3	84-year-old male	Lumbar nociceptive pain with D2 pathological fracture with medullary compression	Neuroendocrine carcinoma of unknown origin metastasized to the bone	Not described	Pain went from 6 [at rest] and 8 [with movement] to a 0 and 2 respectively during COVID infection	Death 51 days after positive COVID test
4	68-year-old male	Painful bone metastasis to the ribs with intense nociceptive chest pain	Thyroid carcinoma, prostate adenocarcinoma, gastric adenocarcinoma metastasized to bone, lung, pleura and liver.	Fever and coughing	Pain went from 8 [at rest] and 9 [with movement] to a 0 and 3 respectively during COVID infection	Death on day 5 of fever onset
5	67-year-old male	Rectal nociceptive and neurogenic pain due to infiltration by a bladder carcinoma	Painful left eye ophthalmoplegia [Tolosa-Hunt syndrome]	Fever, fatigue and coughing	Pain went from 6 to 0 during COVID infection	Reappearance of dyspnea and pain after 20 days of blunting
6	48-year-old male	No postsurgical pain after a knee surgery or pain during physiotherapy	Sensory loss in both hands and legs. Skin biopsy showed reduction in the intraepithelial fiber density in the distal leg	Mild flu-like symptoms, severe anosmia, and ageusia	Patient presented with sensory loss	The COVID-illness lasted a month, but most of his neurological symptoms continued progressively resolving after a year

7	44-year-old female	Diffuse muscle pain	Neck and lower back pain	Anosmia and ageusia	Pain went from intense to no pain	Pain resumed after three months post COVID infection
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It is unknown how SARS-CoV-2 infection modulated pain perception during the COVID-19 illness. The SARS-CoV-2 Spike glycoprotein (S-glycoprotein) binds to the Angiotensin-Converting Enzyme 2 (ACE2) protein, a noci-receptor located at the dorsal root ganglia. When viruses get access into the sensory neuron via the ACE2 receptor ends harming their axons, as shown in the last case where a decrement in intraepidermal nerve fibers density was reported [6].

An alternative door for SARS-CoV-2 virus is throughout the Neuropilin NRP1, also known as vascular endothelial cell growth factor 165 receptor [VEGF165R] [7]. When the viral spike interact with the NRP1 protein causes the virus to get access into the cell. In animal models the SARS-CoV-2 spike protein might interfere with pain signaling while interrupting the vascular endothelial growth factor-A [VEGF] /neuropilin-1 [NRP-1] signal pathway and diminishing or preventing the pain sensation. The VEGF has a pronociceptive effect making sensory neurons to fire. In an animal study when VEGF was applied on the paw induced pain in 24 hours, but that painful response was blocked when VEGF and viral spike were used together. NRP1 is a cofactor for the ACE2 receptor and co-work with the ACE2 in modulation of pain [4,8-13].

Conclusion

This case in conjunction with six prior cases suggests that SARS-CoV-2 infection may acutely and sub-acutely modulate chronic pain. Therefore, a high index of suspiciousness for COVID-19 infection should be maintained in any case of an acute and unexplained resolution of chronic pain, regardless if patient is symptomatic for COVID 19 infection.

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Disclosures

The authors report no disclosures relevant to the manuscript.

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None.

Conflicts of Interest

None.

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