

# Chronic pain and cognition

## Dor crônica em cognição

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**P**ain is a very frequent condition in worldwide population. In low- and middle-income countries the prevalence of any type of chronic pain is 33% in adult population, 56% in elderly population, and 35% in workers<sup>1</sup>. Considering chronic widespread pain, we have observed estimates around 10% to 15%, with higher prevalence in women and in those with more than 40 years<sup>2</sup>.

Pain is one of the main causes of absence at work and it affects productivity and burden of disease. In a recent report by the Global Burden of Disease Study 2013, among 188 countries, leading causes of years lived with disability (YLD) were low back pain and major depressive disorder among the top ten causes of YLDs in every country. Back pain was the leading cause of YLDs in 86 countries and the second or third leading cause in 67 countries. In Brazil, it was the first cause, while neck pain was the 8<sup>th</sup> cause of YLDs<sup>3</sup>.

Many studies have correlated pain with cognitive impairment. Many biases could concur for these. Pain killers with important central nervous system action, anxiety, depression, and other co-morbidities, as cancer or chronic diseases.

Ferreira et al.<sup>4</sup>, in this issue, have reported cognitive evaluation of patients with chronic pain and determined the main confounder factors observed to be associated with cognitive impairment.

Two systematic reviews and meta-analyses have evaluated studies evolving impairment of working memory and executive functions in people with chronic pain; both have revealed many biases among included studies, mainly due to lack of blinding to outcome. Working memory has been evaluated by different instruments, revealing heterogeneity through studies. Executive dysfunction is an umbrella, with many sides and with very heterogeneous evaluation and results<sup>5,6</sup>.

Other factors are correlated to possible cognitive impairment in pain sufferers, one of them is physical inactivity. We know that physical exercise is good for a better cognitive maintenance<sup>7</sup>; and a systematic review with 1,159 older adults has showed that subjects with chronic pain have had a significantly lower level of physical activity compared with 576 elders without chronic pain<sup>8</sup>.

We can observe through studies that a huge amount of different methods has been used to evaluate cognitive performance, sometimes studies have utilized validated instruments, some of them have used self-report measures, and others neuropsychological instruments. Most of these instruments have not been validated for pain patients<sup>9</sup>.

Thickness of dorsolateral prefrontal cortex and ventromedial prefrontal cortex are associated with complex regional pain syndrome, with thinner cortex in patients in relation to controls. These structural differences can explain executive dysfunction observed in these patients with chronic pain<sup>10</sup>.

A long follow-up study has observed that pain and depressive symptoms have been significantly associated; despite aging and frailty<sup>11</sup>. Any study that figures out cognition and pain must control depressive symptoms, like the study conducted by Ferreira et al. in this issue.

Ferreira et al.<sup>4</sup> evaluated 45 patients with chronic pain matched by age, gender and schooling to 45 controls without pain. The group with chronic pain had shown more frequency in major depressive disorder, generalized anxiety disorder, unrefreshed sleep, and hypothyroidism. Cognitive evaluation had revealed significant differences in MoCA test (total score), verbal fluency, clock drawing, and in all measures of Stroop Test, the control group outperformed chronic pain group. Summarizing, measures of general cognition, executive function, planning, visuospatial function, processing speed, and response inhibition.

According to authors, this study is the first in Brazil. More studies are necessary, with more comprehensive cognitive evaluation, with a larger number of patients, to permit analyses with

different pain duration, pain intensity, and etiologies. It is a valuable study in this field in our country.

There are many potential biases, when we study cognitive function and pain: duration (acute versus chronic), intensity of pain, personality traits, humor disorders, sleep disturbances, type of analgesics (opioid use, for example), etiology of

pain (back pain due to osteoarthritis, multiple sclerosis, polyneuropathy, fibromyalgia), age, gender, religious influence, and life style. For these reasons, besides heterogeneous evaluation instruments, different diagnostic criteria for chronic pain, and different cognitive domains included in the studies, research in this field is complex and remains a great challenge.

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