

Other journals in brief

A selection of abstracts of clinically relevant papers from other journals.

The abstracts on this page have been chosen and edited by John R. Radford.

'...A brain functionally addicted to pain'

The emotional brain as a predictor and amplifier of chronic pain

Vachon-Preseu E, Centeno MV *et al.* *J Dent Res* 2016; **95**: 605–612

Chronic pain would appear to be disorders in neural networks; not as a consequence of nociceptive barrage to the cortex.

The authors set a scholarly tone for this Critical Review by drawing the distinction between qualia ('raw feels' that is a perception in isolation from any effect it may have on behaviour), and chronic pain that 'persists in the absence of stark inputs' and is 'no longer coupled with an appropriate behavioral repertoire.' Looked at in another way, nociceptive mechanisms protect the body from harm with the pain subsiding as the injury resolves, in contrast to chronic pain that manifests itself as 'persistence of pain past the normal healing period.'

Human neuroimaging studies in those with chronic pain have shown 'that different chronic pain conditions are associated with distinct brain properties' challenging the proposition that chronic pain is the result of 'an increased and/or sustained nociceptive barrage impinging on the cortex'; factors such as 'demographics, affective states, lifestyle, comorbidities, and others' account for only a relatively small amount of variance in those suffering from chronic pain.

The emotional brain (corticolimbic system), which is pivotal to reward and motivated behaviour, is also a modulator of acute pain but a mediator for chronic pain. When considering chronic pain, connections between the nucleus accumbens and medial prefrontal cortex (mPFC) predict those who will develop persisting pain following acute back pain. Then chemical and structural changes in the brain have been shown in those with temporomandibular disorder in that there is 'a decrease in striatal dopaminergic uptake...and with changes in gray and white matter properties of corticolimbic regions.' In addition, patients with burning mouth syndrome show 'structural differences in the hippocampus and mPFC, as well as increased functional connectivity between frontal and limbic regions...' And those who suffer chronic pain following dental surgery have 'higher cerebral blood flow in the thalamus, frontal regions and sensorimotor cortex.' This does not, however, refute the observation that psychological and personality traits have a role in chronic pain. The amygdala and hippocampal volumes have been associated with several psychiatric disorders and chronic pain conditions.

As recurring pain would appear to reorganise the brain circuitry, a research priority is to identify optimal timings for therapeutic interventions to minimise this transition from acute to chronic pain. D-cycloserine, used also as a second-line drug for the treatment of tuberculosis, and sarcosine, found in several foods and used to manufacture SLS in toothpaste and dopamine, may each have a role in preventing the transition to and the management of chronic pain.

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Life course epidemiology

Oral health-related beliefs, behaviors, and outcomes through the life course

Broadbent JM, Zeng J *et al.* *J Dent Res* 2016; **95**: 808–813

'...self-reported oral health by the age of 38 y... is influenced by intergenerational factors and various aspects of our beliefs, socio-economic position, dental attendance, and self-care, which operate over the years since childhood.'

The onset and progression of dental diseases can be steered by structural factors including social and economic factors, whereas diet and home oral care are behavioural drivers. Then there are life course models that recruit modifiers for disease risk. The investigators used generalised structural equation modeling to investigate the relationship between oral health-related beliefs and behaviours in childhood and early adulthood, and dental health outcomes including quality of life in adulthood. The participants were members of the Dunedin Study. This ground breaking study has followed the health, including oral health, the development and behaviour of 1,037 people since birth for now over 40 years. The key finding from this paper is that factors affecting oral health in childhood influence oral health quality of life in adulthood. This would support the 'accumulation of risk' model rather than a critical or sensitive period (for seminal paper on this subject see *J Epidemiol Community Health* 2003; **57**: 778–783, cited by 825).

DOI: 10.1038/sj.bdj.2016.598

Dental effects of methamphetamine

Methamphetamine users have increased dental disease: a propensity score analysis

Shetty V, Harrell L *et al.* *J Dent Res* 2016; **95**: 814–821

Although 'not consistently as extreme as depicted in earlier reports,' those who use methamphetamine show more extensive caries.

Some commentators have questioned whether or not methamphetamine is associated with a distinct pattern of dental caries; such observations have been based on studies with a small sample size, lacking methodological rigor especially issues with reporting bias. The key findings from this study were that methamphetamine users were '4 times more likely to have teeth affected by dental caries and roughly twice as likely to have untreated dental caries' compared with controls. In addition, the pattern of caries in those that use methamphetamine was distinct with the highest occurrence in maxillary central incisors, and then the maxillary premolar and molar teeth. Those who injected methamphetamine had higher caries rates than those who smoked or snorted the drug. These investigators used a covariate-balancing propensity score strategy to examine the effect of methamphetamine on dental caries in users from Los Angeles County (n = 571) compared with controls (n = 2,755).

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