

24 THE SHORT-TERM EFFECTS OF CGRP MONOCLONAL ANTIBODIES ON BONE TURNOVER: A PROSPECTIVE COHORT STUDY

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10.1136/bmjno-2023-ANZAN.25

Background Calcitonin gene-related peptide monoclonal antibodies (CGRP mAb) are an effective treatment of migraine however may have possible off-target effects. Pre-clinical studies implicate CGRP in several aspects of bone turnover and homeostasis. The clinical effect of CGRP mAb on bone turnover is not known, however.

Methods Between June 2021 and July 2022, a multi-centre prospective cohort study was undertaken with eligible patients undergoing paired testing of the validated bone turnover markers procollagen type I N-terminal propeptide (P1NP) and serum C-terminal telopeptide of type I collagen (CTX) prior to and at least three months following administration of a CGRP mAb.

Results A total of 45 patients with a mean age of 41.8 (SD 11.9) were included in the final analysis, all of whom received a ligand-targeting CGRP mAb. Administration of a CGRP mAb was associated with a statistically significant increase in P1NP from 44.5microg/L to 51.5 microg/L ($p=0.004$), but no significant change in CTX.

Conclusion In otherwise homeostatic conditions, short-term administration of a CGRP mAb is associated with increased P1NP, a bone formation marker but not with increased CTX, a bone resorption marker. Further study is required to validate these findings over longer time periods, in a larger cohort, and in pre-existing states of increased calcium stress and bone-turnover.

25 OPTIC NERVE SHEATH DIAMETER DURING ASCENT TO HIGH ALTITUDE IN SHERPA AND LOWLANDERS

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10.1136/bmjno-2023-ANZAN.26

Objectives Raised intracranial pressure is proposed to be a mediator of acute mountain sickness. However, establishing this is difficult due to the invasive nature of intracranial pressure measurement. In this study we used a non-invasive estimate of intracranial pressure, ultrasound of the optic nerve sheath diameter (ONSD), during ascent to high altitude in both low-altitude residents and high-altitude natives.

Methods 42 (30 low-altitude, 12 high-altitude residents) participants ascended from 1300 to 5050m with ONSD, cerebral blood flow (CBF, duplex ultrasound), and arterial blood gas measurements at 1300, 2700, 3400, 4125 and 5050m. Lake Louise acute mountain sickness scores were collected at 5050m.

Results Ascent to high-altitude was associated with an increase in median [IQR] ONSD (4.61mm [4.39–5.26] at 1300m to 6.47mm [5.78–7.34] at 5050m). At 5050m, those with more symptoms of acute mountain sickness had larger optic nerve sheath diameters ($r=0.47$, $p=0.015$). The increase in ONSD was related to an increase in CBF with altitude ($p=0.005$). High-altitude residents ascending to altitude had higher baseline ONSD, however this did not increase with altitude as much as low-altitude residents (interaction $p=0.0001$).

Conclusions Increased optic nerve sheath diameter with ascent to altitude supports the theory that intracranial pressure rises during ascent to high altitude and that this may contribute to acute mountain sickness. The increases in ONSD are mediated in part by increased cerebral blood flow. The smaller increase in ONSD in Sherpa may protect against acute mountain sickness.

Best Case Reports 2023 Abstracts

2819 ICTAL FUNCTIONAL-MRI GUIDED STEREO-EEG THERMOABLATION IN A CASE OF TOOTHBRUSHING EPILEPSY

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10.1136/bmjno-2023-ANZAN.27

Objectives We present a case of a toothbrushing epilepsy, a rare form of reflex epilepsy, where seizures are reliably induced by toothbrushing. Ictal functional MRI (fMRI) and Stereoelectroencephalography (sEEG) were used to localise the seizure onset zone and following highly localised radiofrequency thermocoagulation the patient was rendered seizure free.

Method Case Report

Results A 22-year-old female patient had drug-resistant toothbrushing-induced focal motor seizures since age 14. Seizures manifested as daily episodes of right facial dystonia, with additional triggers including eating, talking and strenuous exercise. Ictal Scalp EEG demonstrated low voltage fast activity over the left pericentral area. Structural MRI imaging did not reveal a definite epileptogenic lesion. fMRI of a toothbrushing induced seizure highlighted a region in the low pericentral area with an unusual but not definitively abnormal anatomical arrangement. sEEG in this area demonstrated frequent focal spikes and sharp waves (irritative zone). Radiofrequency thermocoagulation to this area was performed and the patient has remained seizure free for more than two years.

Conclusion In reflex epilepsy, the seizure precipitants highlight the likely seizure onset zone. Functional MRI can provide further localising information to more precisely guide the implantation of intracranial sEEG electrodes. Interestingly, ictal fMRI revealed the local seizure network, which was immediately adjacent to the irritative zone, in the depths of the central sulcus. Highly focal thermocoagulation can render patients seizure free if the seizure focus can be accurately defined.