Project Title: "Serum Neurofilament light chain (sNfL) as a marker of treatment-response in migraine"

Recipient: Katarina Alexandra Ebner, University Hospital of Basel (USB), Clinic of Neurology and Department of Clinical Research

Esteemed board members of the Swiss Headache Society

In November 2021, you honored me with the "SKG Hansruedi Isler" Scholarship. This grant was very important for the implementation of our study, at the University Hospital of Basel, exploring the role of serum biomarkers in migraine.

Aim of our study was to investigate if serum Neurofilament Light (sNfL) levels are associated with migraine severity and with treatment-response to anti-CGRP monoclonal antibodies (mAbs).

Neurofilaments are a meanwhile well established and highly sensitive blood biomarker of neuro-axonal injury, reflecting treatment response in several clinical trials in multiple sclerosis (MS) and other neurological diseases (1). Since functional but also structural brain changes (white matter lesions, volumetric changes in the grey matter etc.) are well-described in migraine (2), it seems possible that a marker of structural neuroaxonal damage may be increased and could be normalized by effective treatment.

Thus, we examined sNfL levels in patients with migraine at baseline (before treatment onset with CGRP-mAbs) and after 6 months of treatment. Our hypothesis was that sNfL z scores may be elevated in migraineurs at baseline and that response to treatment may be associated with reduction in sNfL levels after 6 months.

CURRENT STATUS OF THE PROJECT

Currently, we included 67 patients (84% women, mean age of 40 years (range 19-70 years), most patients with chronic migraine (64%).

Medical reports and questionnaires (MIDAS, HIT-6, ASC-12 and HADS) from the consultations in our headache clinic as well as the patients' headache diaries were collected, counting headache days during three months before treatment initiation (= baseline) and during six months of treatment.

sNfL were measured at baseline in the lab of Prof. J. Kuhle (USB), using a Simoa Assay as previously described (3). Up to date, the follow-up visit at month 6 was performed in 44 patients (15 visits still pending, 8 patients were lost to follow up).

In addition, we examined a subgroup of 42 patients using quantitative sensory testing (QST) at baseline, to measure different pain thresholds as well as allodynia, for a more detailed patient phenotyping.

PRELIMINARY RESULTS

We presented preliminary results on clinical features of our patients in the European Headache Congress 2023 in Barcelona and the «Dreiländertagung Kopfschmerz" in Interlaken 2024 (4). These results focused on allodynia, as quantified per QST, which was

interestingly present in the majority of our patients at baseline, including not only the face/trigeminal area, but also the hand, suggesting central sensitization.

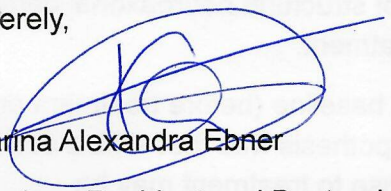
Regarding our primary aim, the age- and BMI-adjusted Z scores of the sNfL at baseline showed heterogeneity among our patients (mean Z score= -0.38, with however large range from -2.2 to 2.3). The analysis regarding the course of sNfL over 6 months and its associations with treatment response and other patient characteristics is currently ongoing.

OUTLOOK/NEXT STEPS

We are currently focusing on the statistical analysis and interpretation of our results, which will be presented in a scientific paper. Moreover, depending on our findings, we aim at examining additional serum biomarkers and/or the combined value of biomarkers and clinical features (e.g. allodynia) in understanding migraine severity and response to prophylactic treatment.

I want to thank you for your trust and the SKG Hansruedi Isler scholarship, which supported our efforts towards the development of quantifiable biomarkers in the migraine field.

Sincerely,



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