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Biomarkers for neuropathic pain – Is the old alpha-1-antitrypsin any good?



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Aims: In a previous comparative two-dimensional gel electrophoresis study [1], we described seven cerebrospinal fluid (CSF) proteins highly discriminating between neuropathic pain patients and healthy controls. The aims of the present follow-up work were to examine the multivariate inter-correlations between all identified isoforms of these seven proteins. The focus was not on discriminant analysis but rather on the internal correlation structure between these proteins in healthy controls vs neuropathic pain patients. Our hypothesis was that neuropathic pain is associated with a disrupted correlation structure between these protein isoforms. Moreover, focusing on the patients, we wanted to regress clinical pain parameters (pain intensity and pain duration), using all the proteomic data (260 proteins) of our previous study [1] as predictor variables, thereby testing the hypothesis that the above-mentioned seven discriminating proteins and/or their isoforms would be among the proteins having the highest predictive power for clinical parameters.

Methods: Biochemical identification of isoforms of the above-mentioned seven proteins. Principal component analysis (PCA) was used to describe and compare the correlation structures of patients vs. healthy controls, and orthogonal partial least square (OPLS) analysis was used to regress clinical parameters [2,3].

Results: We identified 5 isoforms of angiotensinogen, 18 isoforms or fragments of alpha-1-antitrypsin, 5 isoforms of haemoglobin, and 5 isoforms of pigment epithelium derived factor. In patients and using PCA, a down-regulated fragment of alpha-1-antitrypsin correlated to another up-regulated fragment of alpha-1-antitrypsin, indicating a possible physiological relationship. The OPLS regression of clinical parameters in patients also seems to yield interesting results (work in progress).

Conclusions: Some of the seven proteins that were the main results of our previous study [1] reappear in different ways in the results of the present study. This strengthens our interest in characterizing the nature of their post-translational modifications.

References

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Acute bilateral experimental neck pain: Reorganise axioscapular and trunk muscle activity during slow resisted arm movements



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Aims: Neck pain is frequent and many develop on-going neck pain after the initial onset. Studies on clinical neck pain suggested that altered axioscapular muscle activity may be an important factor in on-going neck pain. This study investigates the effect of bilateral experimental neck pain on axioscapular muscle activity during standardised resisted arm movements.

Methods: 25 healthy participants were recruited for this single blinded cross-over study. Experimental pain was induced by bilateral injection of hypertonic saline into the splenius capitis muscle. Isotonic saline was used as a control. Pain intensity was recorded using an electronic visual analogue scale

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