FULL-LENGTH ARTICLE NPub.org/2g7ddi

Muscle and not neuronal biomarkers correlate with severity in spinal and bulbar muscular atrophy

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Study objective and summary result

This study explored whether blood levels of neuronal biomarkers (neurofilament light chain [NfL]) or muscle biomarkers (creatine kinase [CK] and creatinine) correlate with disease severity in spinal and bulbar muscular atrophy (SBMA), and it found that blood creatinine levels can serve in this role.

What is known and what this paper adds

Clinical trials for SBMA therapies are limited by the lack of reliable biomarkers for disease progression and therapeutic responses. This study provides evidence that blood creatinine levels could serve in this role. Further, while both neuronal and muscle markers exist for SBMA, this study highlights the relevance of the latter.

Participants and setting

This study recruited 50 patients with SBMA through the National Hospital for Neurology in London, UK, and 43 patients with SBMA through the University Hospital in Padova, Italy. This study also recruited 53 patients with amyotrophic lateral sclerosis (ALS) and 73 healthy controls (HCs) through the same centers.

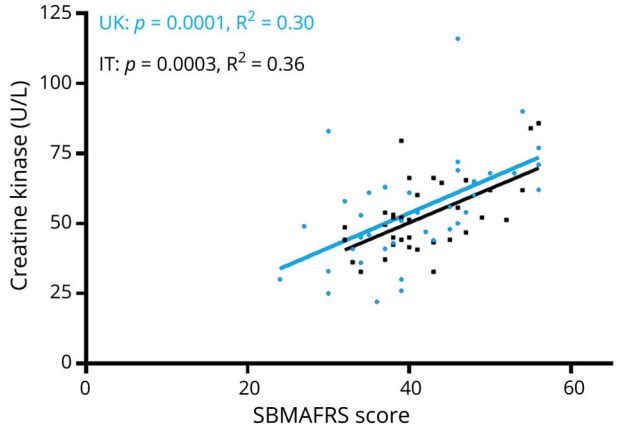
Design, size, and duration

This study collected blood samples from all participants and used single-molecule array technologies to measure plasma or serum levels of NfL, CK, and creatinine. The participants with SBMA underwent disease severity assessments with the SBMA Functional Rating Scale (SBMA-FRS) and the Adult Myopathy Assessment Tool (AMAT) at baseline and at 12- and 24-month follow-up timepoints. Lower SBMA-FRS and AMAT scores reflect greater disease severities. This study used analysis of variance for between-group comparisons of NfL, CK, and creatinine levels. This study tested for correlations between blood biomarker levels and SBMA severity test scores.

Primary outcome measures

The primary outcomes were correlations between blood biomarker levels and SBMA severity test scores.

Figure Correlations between creatinine levels and SBMA-FRS scores in the UK (blue) and Italian (black) cohorts



Main results and the role of chance

The SBMA group's NfL levels were comparable to those of the HCs ($p = 0.99$). Compared to the ALS group and the HCs, the SBMA group had higher CK levels and lower creatinine levels ($p < 0.0001$). Lower creatinine levels in the SBMA group correlated with lower SBMA-FRS and AMAT scores ($p \leq 0.0011$).

Bias, confounding, and other reasons for caution

This study did not collect complete data for all participants.

Generalizability to other populations

The recruitment of participants through only 2 centers may limit the generalizability of this study's results.

Study funding/potential competing interests

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A draft of the short-form article was written by M. Dalefield, a writer with Editage, a division of Cactus Communications. The authors of the full-length article and the journal editors edited and approved the final version.