

O-6-3

Non-invasive skin autofluorescence of advanced glycation end-products is useful biomarker for pain symptoms in patients with degenerative cervical myelopathy

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Background: Advanced glycation end-products (AGEs) are reportedly associated with low back pain and lower extremity symptoms. However, the association of AGEs with pain and clinical outcomes in patients with degenerative cervical myelopathy remains unknown.

Research question: To clarify the association of AGEs with pain and clinical outcomes in patients with degenerative cervical myelopathy.

Design: A single-center prospective observational study.

Methods: 93 patients with degenerative cervical myelopathy were included in the study. We examined patients' characteristics, laboratory data, magnetic resonance imaging findings, the numeric rating scale (NRS) for pain at each body area, and patient-reported outcomes. Non-invasive measurements of skin autofluorescence intensity of AGEs (AGE score) were evaluated using a AGE sensor. Eligible patients were divided into two groups according to the AGE score cutoff value of 0.55: the AGE-low and AGE-high groups. We compared the abovementioned variables between the AGE-low and AGE-high groups. Then, we performed the multiple regression analysis to clarify the association between AGE score and NRS scores at leg and foot.

Results: 41 were included in the AGE-low group, and 52 were in the AGE-high group. No significant differences in patients' characteristics, comorbidities, laboratory data, MRI findings, and patient-reported outcomes were observed between the two groups. However, the AGE-high group showed relatively worse NRS scores at entire body parts compared to the AGE-low group. Especially, the AGE-high group had significantly greater NRS scores at leg ($p = 0.032$) and foot ($p = 0.030$) than the AGE-low group. Multiple regression analysis revealed that the AGE score was significantly associated with NRS scores at leg ($p = 0.016$) and foot ($p = 0.003$).

Discussion: AGEs assessed by non-invasive skin autofluorescence could serve as a biomarker for pain symptoms in patients with degenerative cervical myelopathy.