P3. Transtemporal investigation of brain parenchyma elasticity using 2-D shear wave elastography: Definition of age-matched normal values—M. Ertl [1], N.S. Raasch [1], G. Hammel [2,3], K. Harter [2,3], C. Lang [1] ([1] Klinikum Augsburg, Clinic for Neurology and Neurophysiology, Augsburg, Germany, [2] Technical University of Munich and Helmholtz Zentrum München, Chair and Institute of Environmental Medicine, UNIKA-T, München, Germany, [3] CK-CARE, Christine Kühne - Center for Allergy and Research and Education, Davos, Switzerland)

Objectives: The investigation of tissue stiffness using 2-D shear wave elastography is already widely used in clinical practice and research for a variety of parenchymatous organs, with the exception of the brain. The goal of our research was to assess the possibility of reliable investigation of brain tissue stiffness using ultrasonographic brain parenchyma elastography with an intact temporal bone.

Methods: We enrolled 108 patients after exclusion of intracranial pathology or healthy volunteers. All patients were subdivided by age into groups: 20–40, 40–60 and >60 y. For statistical analysis, the χ^2 test and *t*-test were used. The mean values, regardless of age and other parameters, were 3.34 kPa (SD = 0.59) on the left side and 3.33 kPa (SD = 0.58) on the right side.

Results: We found no correlation between the values, body mass index ($r = 0.07$, $p = 0.48$) and gender ($t = -0.11$, $p = 0.91$), but we observed a highly significant correlation between the values and age ($r = 0.43$, $p < 0.0001$). Additionally the values of the ipsilateral side of two patients with proof of ischemic stroke in neuroimaging were 1.58 and 2.35 kPa. One patient with proof of a hemorrhagic stroke showed a value of 10.98 kPa on the ipsilateral side. The values on the contralateral side were 3.49 and 4.72 and 3.57 kPa, respectively.

Conclusions: We found ultrasonographic brain parenchyma elastography to be a valid, reproducible and investigator-independent method that reliably determines brain parenchyma stiffness. As far as we know from MR-elastography (MRE) studies, our values are in agreement with measurements in the deep white matter (average elasticity of 3.0 kPa [SD = 0.2] within the age group of 60–69 y). This was the first study to prove the reliable ultrasonographic investigation of brain parenchyma stiffness with an intact temporal bone. In the little number of previous studies all patients were examined after parts of the skull having been removed before.

Significance: The distinct difference of values taken in normal tissue and in areas affected by ischemic or hemorrhagic stroke might disclose an innovative application of ultrasound elastography. Other possible applications might be the differential diagnosis of dementias or the identification of symptomatic lesions for epilepsy (temporal sclerosis), thereby complementing other imaging

techniques with all the advantages of ultrasound applications (bedside method, easily repeatable, *etc.*). Future studies should deal with the examination of aforementioned patient cohorts and correlation with MRE values.

doi:10.1016/j.clinph.2018.04.647