**Background and objective**

Clinical and population studies have reported an increased prevalence of asymptomatic deep white matter lesions (DWMLs) in migraine patients. Migraine with aura (MA) is associated with high frequency and larger size of right-to-left shunts (RLS). There are suggestions that not only age, cardiovascular risk factors, and attack frequency, but also embolization through RLS may give rise to DWMLs in MA. The aim of this study was to evaluate the relationship between RLS and DWMLs.

**Materials and methods**

The participants of the study were out-patients of Vilnius university hospital Santa-riskiu klinikos with active MA. The study protocol was approved by the Lithuanian Bioethics Committee. Migraine characteristics, demographic data, use of abortive and prophylactic medication were collected.

RLS was assessed using contrast transcranial Doppler sonography (c-TCD) method with agitated saline and detection of microembolic signals (MES) in middle cerebral artery according to the Venice Consensus Conference. The results were documented separately for rest condition and Valsalva maneuver (VM) testing (fig. 1).

Magnetic resonance imaging (T1, T2 and FLAIR sequences) was performed with a 1.5 T scanner. Two radiologists, both blinded to the results of c-TCD, rated DWMLs on digital images ($\kappa$=0.945, ICC 0.951 [95%; 0.929-0.967]) using visual rating scale of Scheltens (table 1).

Presence and size of RLS was compared between patients with and without DWMLs. Load of DWMLs was compared between patients without RLS, with RLS, and with large RLS.

**Results**

We enrolled 65 MA patients (table 2). RLS was confirmed in 42 (64.6%) cases, 27 patients (41.5%) had large shunt. DWMLs were present in 17 (25.8%) cases. The mean value of visual rating score was 1.24±2.63, the largest score was 11 (fig.2).

Patients with DWMLs were significantly older and with greater disability. They have more attacks of migraine and more frequently used β-blockers as prophylactic treatment (difference non significant). There were no differences in the presence of RLS and large RLS between patients with or without DWMLs (table 2), and in DWMLs load between without RLS, with RLS, and with large RLS.

Only older age was associated with the presence (OR 1.217 [95% CI; 1.094-1.353], p<0.001) and the load of DWMLs (β=0.502, p<0.001).

**Conclusions**

Presence and size of right-to-left shunt does not increase prevalence and load of DWMLs in migraine with aura.