SUMMARY

Aquaporins (AQPs) are highly selective channel proteins, which play an important role in transcellular and transepithelial water transport. Recently, numerous articles on the importance and function of AQPs in mammals, including humans, have been published, resulting in a better understanding of their physiological role in various organs. Latest reports indicate a significant role and participation of AQPs in the proliferation, migration, invasion and angiogenesis of neoplastic cells. In particular, cancer studies indicate that AQPs can potentially be used as prognostic markers due to their involvement in the process of oncogenesis as well as tumor progression and invasion.

Lung adenocarcinoma (ADC) is the most common primary lung cancer seen in patients in Europe and the United States. Noteworthy, it is often not diagnosed until the tumor is at an advanced stage.

In the present study, the research hypothesis assumed that the level of AQP3 and AQP4 protein expression in ADC may be a prognostic factor and correlate with patients' clinical and pathological outcomes. The study was retrospective and the biopsy samples of 79 patients were analysed. The protein expression of AQP3 and AQP4 was analysed based on immunohistochemical staining. AQP3 protein expression was observed in the cytoplasmic membrane of the cancer tissue in 82% of lung samples (65 of 79). Significant differences in relative protein expression of AQP3 were noted between advanced age patients compared to younger counterparts (average 64.6 years of age ±8.9 vs. average 60.3 years of age ±6.5, p=0.017). A high expression of AQP3 was significant in cancer tissue when compared to the control group (100% vs. 65%, p<0.001). Low AQP4 membrane expression was correlated with more advanced disease status, e.g. lymph nodes metastases (89% vs. 67%, p=0.046). Whereas a low AQP4 membrane expression was noted as significantly common in cancer tissue compared to non-neoplastic lung tissue (92% vs. 32%, p<0.001).

Based on the conducted studies, it can be concluded that samples collected with minimally invasive techniques are adequate to determine the expression of AQPs in ADC, however, the potential clinical prognostic value of AQP3 and AQP4 expression still requires further studies.

Keywords: AQP3, AQP4; lung cancer; NSCLC; adenocarcinoma; bronchoscopy biopsies