in neurons, loss of small-cell perivascular spongiosis and plaque formation were quite pronounced. The most obvious changes were in the upper layers of the cortex where focal atrophy was more prominent than laminar. A large number of corpora amylacea can be significant not only in the foci of necrosis but also in areas of chronic ischemia.

CONCLUSION

Cerebral microangiopathy is a morphological sign of diabetic encephalopathy.

PP-D-03

MORPHOLOGICAL CHANGES OF THE BRAIN IN PATIENTS WITH TYPE 2 DIABETES MELLITUS AND COVID-19

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OBJECTIVES

To investigate the brain tissue of patients with type 2 diabetes mellitus who died from COVID-19.

METHODOLOGY

This study included 31 patients with type 2 diabetes mellitus who had a positive test for SARS-CoV-2 detected by qRT-PCR and eventually expired in 2021 in Lviv regional and city hospitals from complications of COVID-19. We studied macroscopic and microscopic changes in the brain with the use of common histological and immunohistochemistry staining for activated astrocytes (GFAP, Thermo Scientific), activated microglia (CD68, Clone Ab-4, Thermo Scientific), T lymphocytes (CD3, Clone SP7, Thermo Scientific) in the cortex, basal ganglia, brainstem and cerebellum.

RESULTS

In all the cases, arteriolosclerosis with perivascular rarefaction was present. Ischemic lesions in the brain with focal encephalolysis were documented in 15 (48, 39%) out of 31 patients with type 2 diabetes mellitus. Hemorrhagic infarctions were rare. The main cyto/angio-architectural manifestations of brain damage were diffuse alteration of the basement membranes and vascular endothelium, capillary fibrosis and hyalinosis, pericyte proliferation, congophilic angiopathy accompanied by a sharp disruption of transcapillary transport. The astrogliosis with positive GFAP was seen in all cases but showed variable degrees. The perivascular activation of microglia and the microglial nodules with CD68 positive cells were in the studied regions of the brain, but less in the cerebellum. Perivascular infiltration by CD3 was most pronounced in the brainstem.

CONCLUSION

The morphological changes associated with COVID-19 and type 2 diabetes mellitus include pathology of the microvasculature, ischemic infarction with encephalolysis, astrogliosis, microgliosis and perivascular infiltration by CD3 in different regions of the brain.

PP-D-04

ASSOCIATION OF CIRCULATING HYPOXIA-INDUCIBLE FACTOR 1 ALPHA WITH TYPE 2 DIABETES IN INDIVIDUALS WITH SEVERE OBESITY

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OBJECTIVES

Obesity and type 2 diabetes (T2D) are often attributed to hypoxia. Adaptive responses to hypoxia are regulated by hypoxia-inducible factor 1 α (HIF1α). The role of hyperglycemia in mediating HIF1α expression and activity remains unclear. This cross-sectional study aimed to evaluate the relationship between plasma HIF1α and T2D in individuals with severe obesity.

METHODOLOGY

The study involved adults with severe obesity recruited at the Khoo Teck Puat Hospital (N=252, age: 45±8 years, 38% men, body mass index: 41.1 ± 6.5 kg/m^2). The level of HIF1α in plasma was measured by immunoassay. Spearman's correlation and modified Poisson regression analysis were used to evaluate the association of HIF1α with glycated haemoglobin (HbA1c) and T2D, respectively.