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IMAGING BIOMARKERS OF LEUKEMIC CHOROIDOPATHY

Oral

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Purpose:

To investigate the presence of subclinical leukemic choroidopathy in patients with acute leukemia (AL). Primary aim was to compare choroidal metrics between AL patients and healthy controls and longitudinally explore choroidal changes before and after disease remission. Secondary aim was to correlate choroidal metrics in AL patients with systemic parameters.

Methods:

This was a prospective longitudinal study of 26 eyes of 14 AL patients. All patients underwent optical coherence tomography (OCT) and OCT-angiography at baseline. Subfoveal choroidal thickness (SCT), total, luminal and vascular choroidal area (TCA, LCA, VCA), choroidal vascularity index (CVI) and flow deficit (FD) were the choroidal parameters considered in the study. With the hypothesis that choroidal hyperreflective foci (HRF) may represent an indirect sign of choroidal infiltration, we included the assessment of HRF in the analyses. OCT and OCT-angiography were repeated when patients reached AL remission. For each included patient an age- and gender-matched healthy control was imaged.

Results:

The TCA, LCA, SCA and choroidal HRF number were significantly higher in patients than controls (p=0.03; p= 0.04; p= 0.02; p=0.001 respectively). Lower hemoglobin levels were associated with lower SCT values (p=0.008). Higher D-dimer values were associated with lower TCA values (p=0.008), lower LCA (p=0.01) values, higher cFD density (p=0.04) and higher number of choroidal HRF (p=0.03). A higher cFD density was associated with a higher WBC count (p=0.04). The SCT, TCA, SCA, and choroidal HRF number significantly reduced after AL remission (p<0.001, p=0.047, p=0.007, p=0.002 respectively). The CVI increased significantly compared to the active phase (p=0.01). See attached table.
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Conclusions:

The study demonstrates a subclinical choroidal involvement in AL patients, with stromal thickening during AL and normalization after remission. We identified choroidal HRF as biomarker of leukemic choroidopathy, and we hypothesized they could have either an inflammatory or neoplastic nature. Choroidal vascular metrics were correlated with a systemic pro-coagulant state.

Choroidal parameters in patients with acute leukemia and controls.

	Acute leukemia patients (n=26 eyes)	Controls (n=26 eyes)	p-value
Subfoveal CT (μm)	330±82	275±73	0.2
TCA (mm^2)	1.65±0.43	1.38±0.41	0.03*
LCA (mm^2)	1.06±0.27	0.91±0.26	0.04*
SCA (mm^2)	0.59±0.19	0.48±0.17	0.02*
CVI	0.64±0.04	0.66±0.04	0.2
cFD density (%)	27.87±2.77	27.89±3.05	0.9
Choroidal HRF (n)	88±24	67±15	0.001*

Choroidal parameters in patients with active acute leukemia and after clinical remission.

	Active leukemia	Post leukemia remission	p-value
Subfoveal CT (μm)	367±88	303±72	0.001*
TCA (mm^2)	1.86±0.31	1.65±0.35	0.047*
LCA (mm^2)	1.16±0.18	1.08±0.22	0.21
SCA (mm^2)	0.70±0.15	0.58±0.14	0.007*
CVI	0.63±0.03	0.65±0.01	0.01*
cFD density (%)	27.89±3.0	28.68±2.89	0.31
choroidal-HRF (n)	75±23	47±11	0.002*