

Circulating GFAP and UCH-L1 as markers of neuronal damage in children with epileptic seizures

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Aim: To evaluate serum level of **glial fibrillary acidic protein (GFAP) & ubiquitin carboxy-terminal hydrolase-L1 (UCH-L1)** as markers of neuronal damage in children with epilepsy and its relation to epilepsy characteristics.

Study design: Case control study.

Methods: n=30 children with epilepsy; n=30 healthy children as controls (aged 6-12y). Seizure severity by Chalfont score.

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet



PUTATIVE BIOMARKERS IN EPILEPSY

Results: Serum GFAP and UCH-L1 levels

- Significantly higher in children with epilepsy than controls.
- Significantly higher in children with generalized-onset epilepsy compared to focal.

	Children with epilepsy (N = 30)	Control group (N = 30)	
	Mean ± SD	Mean ± SD	p Value
GFAP (ng/ml)	17.440±6.736	7.060±3.301	<0.0001*
UCH-L1 (ng/ml)	5.700±1.641	1.813±0.233	<0.0001*

SERUM GFAP AND UCH-L1 LEVELS

- Significantly higher in active epilepsy than in children with no seizures over the previous 6 months
- Significant positive correlation with Chalfont seizure severity scale scores
- Elevated GFAP level was a predictor for active seizures (OR 1.841, 95%CI 1.043-3.250, p=0.035)

UCH-L1	GFAP
<ul style="list-style-type: none"> ✓ Neuron-specific enzyme ✓ Role in axonal integrity ✓ Strict intracellular protein ✓ Circulating level is a strong indicator of neuronal damage and BBB disruption 	<ul style="list-style-type: none"> ✓ Main intermediary filament of astroglia ✓ Involved in white matter, myelination, BBB integrity ✓ Maintains motility of astrocytes

Authors' conclusions: Serum GFAP and UCH-L1 is increased in children with epilepsy especially those with active seizures.

Key Message: GFAP and UCH-L1 may serve as peripheral biomarkers for neuronal damage in children with epilepsy that can be used to monitor disease progression and severity for early identification of those with drug-resistant epilepsy and those who are in need for epilepsy surgery.

EXPERT COMMENT



“GFAP and UCH-L1 levels’ in serum or CSF are used as diagnostic and prognostic markers for traumatic brain injury. Their use in epilepsy is encouraging, especially for refractory epilepsies or epileptic encephalopathies, but sufficient evidence and availability of the assay in developing countries is needed before their routine use is recommended in children.”

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