Seminar in Epileptology

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Testing blood and CSF in people with epilepsy: a practical guide

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Epileptic Disorders

Testing blood and CSF in people with epilepsy

- Laboratory investigations have an important role in determining the cause of seizures, both in new-onset cases, and when there is a deterioration in control in people with known epilepsy
- Over 50% of new-onset seizures, including status epilepticus have an acute symptomatic cause
- Prompt identification of the cause is fundamental to inform management
- A broad range of metabolic, toxic, infectious and autoimmune aetiologies require laboratory testing of blood and/or CSF for diagnosis

Essential laboratory investigations after a first seizure

Parameter	May provoke acute symptomatic seizure	
METABOLIC TRIGGERS	Lower limit	Upper Limit
Glucose	≤2 mM/l (36 mg/dl)	>25 mM/l (450 mg/dl)
HbA1c		
Sodium	≤50 mM/l (115 mg/dl)	≥70 mM/l (160 mg/dl)
Calcium	≤1.2 mM/l (5.0 mg/dl)	≥3.0 mM/l (12.0 mg/dl)
Magnesium	≤0.3 mM/l (0.73 mg/dl)	
Urea or Blood urea nitrogen (BUN)		≥16.7mM/l (100 mg/dl) >35.7mM/l
Creatinine		>884µM/l (10 mg/dl)
OTHER	**Rationale**	
Liver function tests	May indicate systemic disease or alcohol abuse	
Full blood count	May indicate infection (raised white count) or alcohol abuse (raised mean corpuscular volume)	
C-reactive protein	High levels may indicate infection or systemic inflammation	
Serum alcohol level	Detectable levels indicate recent alcohol ingestion	
Urinary Drug screen	Detectable levels may indicate recreational drug use	

HbA1c – Glycosylated haemoglobin. All investigations should be requested urgently, as soon as the patient presents. After more than 24 hours following the index event, a causal relationship between any abnormalities and the seizure cannot be definitively established.

Epileptic Disorders

Role of blood tests in long-term monitoring in epilepsy

- HLA-B*1502 testing, strongly associated with severe cutaneous hypersensitivity reactions, is recommended in people of South East Asian descent if carbamazepine, oxcarbazepine or eslicarbazepine are being considered
- Infrequent (e.g. 2-5 yearly) checking of haematological, renal and/or hepatic function, and a bone profile including vitamin D is sufficient for most people with epilepsy on treatment, unless clinically indicated by symptoms.
- Minor asymptomatic derrangements are common, and rarely significant
- Therapeutic drug monitoring is of little value in most patients, though can be important in selected circumstances