COMPARING THE EFFECTS OF LEVETIRACETAM AND VALPROIC ACID TREATMENT ON LIVER FUNCTION TESTS, PLASMA FREE CARNITINE, LIPID PEROXIDATION AND OXIDATIVE DNA DAMAGE IN CHILDHOOD EPILEPSIES

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Background and Aims: We investigated oxidative stress parameters, carnitine levels, liver function tests (LFT) and their relationship in epileptic children treated with valproic acid or levetiracetam to have a better understanding on AED usage and OD.

Method: LFTs, serum free carnitine and oxidative damage markers and their relations with each other were determined in patients who are on valproic acid or levetiracetam treatment at least for 6 months. 25 patients on therapeutic doses of valproic acid, 26 patients on therapeutic doses of levetiracetam and 26 healthy volunteers as controls were included. LFTs, ammonia, carnitine, lipid peroxidation biomarker malondialdehyde (MDA) and a sensitive marker of DNA damage, 8-hydroxy-2-deoxyguanosine (8-OHdG) levels were measured.

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none">>2 years of ageDiagnosed with generalized epileptic seizures (ILAE)Therapeutic doses of VPA (20-60mg/kg/day) and LEV (20-60mg/kg/day) at least for 6 monthsNormal anthropometric measurements (weight, height and head circumference)Good nutritional status, within normal developmental stage according to peers	<ul style="list-style-type: none">Structural central nervous system abnormalities, intracranial infections, head trauma, birth trauma, neonatal insults or hypoxic ischemic encephalopathy, cerebral palsy, metabolic disorder affecting the CNS, neurobehavioral disorder, neurodegenerative disorder, and drug-induced neurological manifestationPatients with poor compliance, low/high doses, or sub-therapeutic range of AEDs or under polytherapyAbnormal anthropometric measurements, feeding difficulties or malnutrition, with developmental delay or taking antioxidant drugs/vitamins

Results

Table 1: Age distribution (mean) in groups

Groups	Number	Age (mo)	Variable	p value
LEV	26	113.04	VPA	.946
			Control	.819
VPA	25	117.84	LEV	.946
			Control	.957
Control	26	122.12		

Table 2: Gender distribution, no significant difference (p = 0,148).

		Gender		Total
		Girls	Boys	
LEV	Number	11	15	26
	Percentage	42,3%	57,7%	100%
VPA	Number	14	11	25
	Percentage	56,0%	44,0%	100%
Contol	Number	18	8	26
	Percentage	69,2%	30,8%	100%

Liver Function Tests

Ammonia levels are significantly high in LEV group

Oxidative Stress Parametres

Serum Free Carnitine Levels

Serum free carnitine is adversely affected due to VPA. Being significantly low, stays in normal range

- Oxidative stress parameters are the highest in LEV group
- MDA shows medium correlation with 8-OHdG and low correlation with ammonia in LEV group

Conclusion: No hepatotoxicity observed in patients under therapeutic doses of valproic acid. Epileptic children under therapeutic doses of levetiracetam showed significantly elevated levels of MDA and 8-OHdG, which is supportive for oxidative damage under levetiracetam therapy. This result was observed for the first time in childhood epilepsies and further studies are needed to understand its mechanism.