

# Malnutrition, an Important Comorbidity in Patients with Lennox Gastaut Syndrome



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## Abstract

**Background:** Lennox Gastaut Syndrome (LGS) is an epileptic encephalopathy that occurs in the pediatric age is associated with cognitive impairment. It is also considered as refractory epilepsy due to its frequent resistance to antiepileptic drugs, which implies the use of multiple antiepileptic drugs for long periods of treatment, the adverse effects of which could affect the patient's nutrition.

**Objective:** To determine malnutrition in patients with Lennox Gastaut Syndrome and its clinical repercussion.

**Methods:** A retrospective cohort study was performed in patients aged 5 to 19 years with diagnosis of Lennox Gastaut Syndrome, in control of at least 5 years. Anthropometric measurements were recorded and nutritional status was determined. Demographic and clinical characteristics were recorded: type of crisis, age of diagnosis, electro encephalographic characteristics, neuro imaging, number of drugs and comorbidities.

**Results:** Thirty-five patients were studied, the mean age was 6 years (CI 95%: 2-10), 55% were men. Nutritional status was classified as normal (20%), mild malnutrition (11.4%) moderate malnutrition (48.5%), severe malnutrition (17%), and 3.1% of the patients were overweight or obese. Alterations in the electro encephalogram were significantly more frequent in patients with malnutrition ( $p=0.02$ ). Patients with malnutrition required more drugs (2.8; CI 95%: 2-4) and however, the number of epileptic events was significantly higher.

**Conclusion:** Malnutrition is a common phenomenon in pediatric patients with Lennox-Gastaut Syndrome, and in accordance to gravity has a greater impact on crisis management by promoting refractoriness and thereby the quality of life.

**Keywords:** Epilepsy; Malnutrition; Lennox gastaut syndrome

**Abbreviations:** LGS: Lennox Gastaut syndrome; TPM: Topiramate; PTH: Phenytoin; PB: Phenobarbital; CBZ: Carbamazepine; VPA: Valproic acid; VGB: Vigabatrin; LMT: Lamotrigine; EEG: Electro Encephalo Gram

## Introduction

Lennox Gastaut Syndrome (LGS) is an epileptic encephalopathy that occurs in children, so often is resistant to antiepileptic drugs with impact on quality of life of sufferers. It is accompanied by multiple comorbidities, which have a direct effect on the nutritional status: neurological diseases that conditions prostration, alteration of muscle tone, deterioration of the mechanics of swallowing, aspiration and respiratory infections [1]; The use of anti-epileptic drugs that induce enzymes, time for feeding, frequent hospitalizations, fasting periods have also been observed as risk factors.

It is known that LGS encephalopathy alone generates cognitive impairment, structural changes that affect the quality

of life, this with a direct bearing on the nutritional status of patients. Malnutrition, alone, in experimental models has been shown to reduce the volume and number of cortical and glial cells, a significant break in the pyramidal cells, the reduction in the density of cortical dendritic spines and the complexity of the dendritic branches of cortex [2-7].

In patients with catastrophic epilepsies epileptic encephalopathy such as LGS, refractoriness involves the use of multiple antiepileptic drugs prolonged treatment periods, the effects of adverse impact on the nutritional status of patients, for example, Topiramate (TPM) decreases appetite; Phenytoin (PHT), Phenobarbital (PB) and Carbamazepine (CBZ) interfere

with the metabolism of vitamin D increase the risk of osteopenia and osteoporosis [8,9]. PHT and PB decreases the absorption of vitamin B12 and folic acid [10]. Valproic acid (VPA), vigabatrin (VGB), lamotrigine (LMT) and TPM, have shown a decrease in serum total and free carnitine [11,12].

In LGS encephalopathy do not have information to establish the correlation and impact of malnutrition on neurodevelopment, refractory to antiepileptic treatment, associated comorbidities and quality of life of patients suffering from it. The aim of this study is to determine the frequency of malnutrition in patients with Lennox Gastaut syndrome and its clinical repercussion.

## Conclusion

We performed a retrospective cohort study in a patient aged 5 to 20 years hospitalized in the department of Neurology at the Hospital Infantil de Mexico Federico Gomez with diagnosis of Lennox Gastaut Syndrome, according to the criteria of the International League Against Epilepsy (ILAE). Demographic and clinical characteristics were recorded: type of crisis, age of diagnosis, electroencephalographic characteristics, neuroimaging, number of drugs and comorbidities. The weight, height and cephalic perimeter were measured and the body mass index was calculated. The degree of malnutrition was established by the Gomez classification for children under 5 years and Waterloo for ages 5 years 1 month to 20 years taking as reference values of the World Health Organization (WHO) in children under 5 years and the reference values of the Center for Disease Control and Prevention (CDC).

Thirty-five patients were studied, the mean age was 6 years (CI 95%: 2-10), 55% were men. Nutritional status was classified as normal (20%), mild malnutrition (11.4%) moderate malnutrition (48.5%), severe malnutrition (17%), and 3.1% of the patients were overweight or obese. Microcephaly was present in 62%. Alterations in the electroencephalogram were significantly more frequent in patients with malnutrition ( $p=0.02$ ). In patients without malnutrition were observed: slow spike-wave complex was observed in overall 74% more affected frontal and temporal 28%, respectively, 57% right lobe predominance. In patients with malnutrition were observed: slow spike-wave complex 47%, bud removal 25%, 24% polyspike, sharp waves 21%, 17% generalized dysfunction, rapid rhythms during sleep 7%, 35% affected temporal lobe, frontal 17%, 60% left dominance.

Patients with malnutrition required more drugs (2.8; CI 95%: 2-4) and however, the number of epileptic events was

significantly higher. Malnutrition is a common phenomenon in pediatric patients with Lennox-Gastaut Syndrome, and in accordance to gravity has a greater impact on crisis management by promoting refractoriness and thereby the quality of life.

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## Declaration of conflicts of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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