TITLE: GUT MICROBIOTA OF RATS TREATED WITH PREDNISOLONE IN A CHRONIC MODEL SEIZURE INDUCED BY PENTILENETHAZOLE

AUTHORS: LIMA, A.M.D.L.; MORALES, D.L.; ARAUJO, M.C.; GUZZO, E.F.M.; ROSA, G.L.; PADILHA, R.B.; BARTH, A.L.; COITINHO, A.S.; VAN DER SAND, S.T.

INSTITUTION: PROGRAMA DE PÓS-GRADUAÇÃO EM MICROBIOLOGIA AGRÍCOLA E DO AMBIENTE, UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL (RUA SARMENTO LEITE, 500, CEP 90050-170, PORTO ALEGRE – RS, BRAZIL)

ABSTRACT:

Epilepsy is a neurological disorder characterized by spontaneous and recurrent seizures that affects approximately 2% of the world's population. There is no cure for the disease and anticonvulsant treatments are not fully effective for different types of epilepsy. A significant percentage of patients do not respond to these drugs and therefore there is a need for new pharmacological treatments. Although several studies have been conducted, the complex relationship between epilepsy and inflammation has not been fully elucidated. Some evidence has demonstrated the connection between gut microbiota and inflammatory processes that influence the course of disease. Thus, the study of this relationship may help in the development of new therapeutic alternatives. This study aimed to characterize the gut microbiota of rats treated with prednisolone, a steroidal anti-inflammatory, in a model of epilepsy induced by pentilenotetrazole (PTZ). Male Wistar rats (n = 10) with 90 days were treated with prednisolone (1 and 5 mg/kg); 0.9% sodium chloride in the negative control group and diazepam (2 mg/kg) in the positive control group administered intraperitoneally for 14 days. The chronic epilepsy model was induced by PTZ (25 mg/kg) intraperitoneally on alternate days. The characterization of the gut microbiota was performed by metagenomic analysis using new generation sequencing (NGS) through the MiSeq Illumina. Preliminary results indicated a change in the composition of the gut microbiota in the treatment with prednisolone, presenting a reduction in the abundance of the families Clostridiaceae, Lactobacillaceae and Peptostreptococcaceae. At the gender level, treatment demonstrated a reduction in the abundance of *Ruminococcus*, *Alkaliphilus* and *Lactobacillus*; an increase of *Blautia* and *Parabacteroides*; and an absence of *Desulfovibrio*, *Dysgonomonas* and *Turicibacter*, in comparison to controls. Treatment with prednisolone resulted in an expressive increase in the abundance of *Akkermansia muciniphila*, in addition to the presence of *Blautia wexlerae*. These results revealed that the composition of the gut microbiota was substantially altered in response to prednisolone. In this way, the presence of some specific microorganisms may be related to the protective activity of the seizures and the inflammatory processes that cause some cases of epilepsy. Further studies will be needed to elucidate the microbiota, inflammation and epilepsy relationship.

Keywords: gut microbiota, inflammatory processes, seizure

Development Agency: PROPESQ/UFRGS