**INTRODUCTION:**

- Multiple sclerosis (MS) is a neuro-inflammatory and neuro-degenerative disease resulting in demyelization process of neurons;
- But until little is known about the causes of MS;
- Studies show that it is possibly arising from a combination of genetic, environmental and infectious factors to trigger the inflammatory process;
- Exposure to metals can be considered as an external agent, presenting a toxicity that can trigger the inflammatory process;
- In general, population is exposed to metal under nanoparticle (NPs) form, since it is presenting in air, cosmetic and food;
- Radiologically, areas where demyelination may occur can be observed by magnetic resonance imaging (MRI).

**PURPOSE:**

The aim of the present study was to quantify sclerotic lesions in MRI and to evaluate the presence of metallic nanoparticles in patients’ blood with multiple sclerosis.

**METHODS:**

- MRI of patients with multiple sclerosis;
- Development of computational program to quantification involvement brain following steps:
  1. Read image and brain segmentation area
  2. Threshold and tissue segmentation
  3. Involvement quantification

**RESULTS:**

- The infrared spectrum of patients with multiple sclerosis were compared with healthy individuals:

**CONCLUSION:**

- We observed a difference in the indices of metallic nanoparticles between healthy subjects and with multiple sclerosis;
- With our results it will be possible to carry out the association between the brain lesions and the concentration of metal nanoparticles in the blood;
- Future studies guided by our method could indicate the degree of toxicity with metallic nanoparticles in neurodegenerative diseases.