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## Association of childhood obesity with the Central Nervous System: A study of Diffusion Tensor Imaging (DTI)

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**Background:** Previous studies have shown atrophy in gray matter and decrease of white matter (WM) connectivity in several brain regions of obese adults. However, there are controversial results about WM integrity of obese children and adolescents.

**Aim:** Childhood obesity is an important healthy concern around the world, therefore, the aim of this study is to investigate the influence of childhood obesity on change in cerebral connectivity, using Diffusion Tensor Imaging (DTI) by Magnetic Resonance (MRI).

**Methods:** The images were obtained on 3T MRI scanner, and the sample consisted of 117 subjects, of which, 57 obese and 60 normal weight adolescents. The average of age was 13 years old and there were no significant statistical differences ( $p>0.05$ ) between the groups in reference of gender, education, socioeconomical classification and sexual development, except for Body Mass Index (BMI, Z-score,  $p<0.001$ ) as expected. The images process was performed using FSL and the fractional anisotropy (FA) values were compared between the above groups using Statistical Parametric Mapping from MATLAB.

**Results:** The analysis revealed that obese group had decrease of FA in WM regions, when compared to the control group, including the corpus callosum (splenium and body) and medium orbital gyrus. There were no higher FA values in obese group.

**Conclusions:** These findings suggest that obese adolescents may have demyelination in regions of the brain related to impulse control and cognitive functions.

### Biography

Pamela Bertolazzi is a Biomedical Scientist. She has completed her Graduation in 2011 and has worked with diagnostic imaging at Sirio Libanes Hospital for seven years. Currently, she is working as a Sr. Clinical Application Specialist at Siemens Healthineers. During her time at Hospital, she was invited to teach in the first Biomedical Residence Program in Brazil. She is a PhD student with a project focused on cerebral changes of obese children in University of Sao Paulo. Her work has a great repercussion around the world and she hopes that her work will help people in the near future.

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