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Oxidative stress biomarkers in children with sickle cell disease

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Sickle cell disease is one of the most common hematologic disorders in the world and is a serious public health problem in many countries. It has been suggested that oxidative stress plays an important role as a pathophysiological factor and contributes to the complications of the disease. Monitoring oxidative stress involves different parameters associated to pro-oxidant and antioxidant biomarkers. This study aimed to standardize methods to measure eight parameters of oxidative stress in erythrocytes from children with sickle cell disease, comparing with the same parameters in erythrocytes from healthy children. All blood samples were analyzed for methemoglobin, reduced glutathione, thiobarbituric acid reactive substances, percentage of hemolysis, reactive oxygen species and activity of the enzymes glucose 6-phosphate dehydrogenase, superoxide dismutase and catalase. Data were analyzed using Student's t-test and were expressed as the mean±standard deviation. A p-value of <0.05 was considered significant. The differences were significant between children with sickle cell disease and the control group for the parameters methemoglobin, thiobarbituric acid reactive substances, hemolysis, glucose 6-phosphate dehydrogenase activity and reactive oxygen species with higher levels in the patients than in the controls. These parameters have shown great utility as biomarkers of disease severity, which can provide more complete information on the treatment and monitoring of patients with sickle cell disease.

Biography

Priscila Bacarin Hermann was graduated from Federal University of Paraná, Brazil in 2005 in Biochemistry. She has worked at Pequeno Príncipe Children's Hospital in the laboratory of clinical analyzes. She has obtained her Master's degree and PhD in Pharmaceutical Sciences from Federal University of Paraná, Brazil in 2011 and 2015, respectively. She is a Professor at Campos de Andrade University Center, Brazil, since 2012. Since 2014, she is a Member of Brazilian Army, serving as Pharmaceutical Lieutenant at General Hospital of Curitiba, Paraná, Brazil.

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