

Comparative study of oxidative stress parameters in critically ill patients

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Free radical reactions play an important role in the pathophysiological changes in critically ill patients, but there are only few data available regarding to the dynamism of oxidative stress during treatment of critically ill patients. The purpose of this study was to follow and to compare the time course of oxidative stress during treatment of ICU patients.

Patients with burn injury (n=26), sepsis (n=14), polytrauma (PT) (n=13), and acute lung injury (ALI) (n=22) were involved in the study. Blood samples were taken from patient on admission, and on the following 3-5 days. Concentration of malondialdehyde (MDA), reduced glutathion (GSH), protein sulfhydryl (PSH) groups, the activities of superoxide dismutase (SOD), catalase (CAT) and myeloperoxidase (MPO) enzymes were measured spectrophotometrically. Production of reactive oxygen species (ROS) in whole blood was measured by luminol dependent chemiluminescence following phorbol-myristate-acetate stimulation. Blood samples from healthy volunteers (n=9) served as the control.

While the white blood cell count significantly decreased in burned patients during the treatment, it remained on high level in the other groups. Marked granulocytosis and lymphocytopenia was observed initially in all groups that started to normalize only in burned patients from the day 4. ROS production was significantly elevated in septic and ALI patients from admission, but in burned and PT patients it rose significantly from day 3. Plasma MDA level significantly exceeded the control values, peaking on the days 2 and 3 in all groups. Plasma MPO level was significantly elevated in burned, septic and ALI patients from admission, but in PT patients it rose significantly from day 4. PSH level was significantly reduced in septic patients from admission, and in burned and PT patients from the day 2 and 3. GSH level significantly decreased in burned, PT and ALI patients from the day 2 and 3, while in septic patients it stagnated on a low level during the observation period. SOD enzyme activity was below the level of healthy population in most of the patients group, while catalase enzyme activity significantly exceeded it in all groups.

Significantly elevated levels of pro-oxidant markers with parallel decrease in endogenous antioxidants confirmed the presence of marked oxidative stress in critically ill patients. Time course of changes in oxidative stress parameters diverged markedly in critically ill patients mirroring the pathophysiological changes in different diseases. The significant differences in some oxidative stress parameters in survivor and non-survivor patients may have prognostic value.

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Fatty acid composition of human milk in Hungary with special attention to trans fatty acids

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Survey of fatty acid composition of 66 human milks obtained from 19 counties and Budapest, Hungary was performed in a research project supported by the Scientific Council for Health, Hungary. The selection of pregnant women was met all the requirements of WHO/GEMS Food representative sampling protocol, which was performed by the National Institute for Food and Nutrition Science (NIFNS) with the cooperation of health visitors on the basis of several hundred questionnaires. Human milk samples were collected from mothers below 30 years having first partum and had been living for 5 years in the same place. Country representative samples were collected within 2-8 weeks following the delivery with the help of health visitors and were transported to laboratory of NIFNS. The analysis of fatty acid composition, included trans-fatty acids was performed by gas chromatography.

In Hungary, this kind of monitoring was the first one. The total fat content of the samples was in the range of 0.3-6.2 g/100 g. 10 samples were close to the average fat content (4 g/100g) published in the Hungarian food composition table. Fifty-four samples had lower while two samples had higher fat content. The range of saturated fatty acids (SFA) (C8:0, C10:0, C12:0,