

## **Depressed Lymphocyte Glutathione Levels in Patients with Septic Shock**

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**Introduction:** We report a study of three patients with blood culture proven sepsis and hemodynamic instability who demonstrate decreased intracellular glutathione (GSH) levels within lymphocytes when compared with three healthy controls and seven PICU patients who presented with shock and negative blood cultures.

**Methods:** With IRB approval, peripheral blood mononuclear cells were isolated from all patients who presented with clinical shock and suspicion of sepsis. Complete blood counts with differentials and blood cultures were obtained. Cells were stained with fluorescent antibodies and monochlorobimane, an intracellular GSH stain and analyzed by flow cytometry. The patients were compared for clinical presentation, mortality, infectious source, and GSH levels.

**Results:** Patients with septic shock demonstrated GSH  $0.82 \pm 0.06$  relative to frozen standard (FS) while the GSH of healthy controls and children with other illnesses with shock were  $1.015 \pm 0.05$  relative to FS ( $P < 0.01$ ). GSH levels were 18.6% lower than FS and 19.8%  $\pm 0.2\%$  below GSH of other children presenting to the PICU with shock. No patients in the septic shock group died; however, one of the PICU controls eventually died from hepatorenal failure one month after the analysis.

**Conclusion:** Patients with septic shock due to bacteremia experience oxidative stress that can be demonstrated via intracellular levels of GSH. Depleted lymphocyte GSH does not predict outcome nor does it correlate with other oxidative stresses such as cardiogenic shock and respiratory failure.