

Increase in Levels of BDNF is Associated with Inflammation and Oxidative Stress during Cardiopulmonary Bypass

Sébastien Amoureux^{1,2}, Pierre Sicard¹, Claudia Korandji¹, Angélique Borey¹, Salima Benkhadra², Annabelle Segueira-Le Grand³, Catherine Vergely¹, Claude Girard^{1,2}, Luc Rochette¹

¹ LPPCE, IFR Santé STIC 100, Facultés de Médecine et de Pharmacie, Dijon, France;

² Département d' Anesthésie Réanimation, CHRU Le Bocage, Dijon, France;

³ Centre de Cytométrie en Flux, IFR Santé STIC 100, Facultés de Médecine et de Pharmacie, Dijon, France

Corresponding Author: Sébastien Amoureux, LPPCE, Faculties of Medicine and Pharmacy, 7 Bd Jeanne d' Arc, BP 87900, 21079 Dijon Cedex, France. Tel: (+33) 380 393 292; Fax: (+33) 380 393 293; E-mail: sebastienamoureux@gmail.com.

BDNF; cardiopulmonary bypass; oxidative stress; inflammation; cardiac surgery

Cardiopulmonary Bypass (CPB) is thought to generate reactive oxygen species associated with a systemic inflammation and neurotrophins seem to be involved in cardiovascular inflammatory reactions. The aim of this study was to determine the impact of CPB on plasma neurotrophins levels and to appreciate the links existing between inflammation, oxidative stress and neurotrophins. Blood samples were taken from 27 patients undergoing cardiac surgery: before CPB, during ischemia and at reperfusion under CPB. Oxidative stress was evaluated using an Electron Spin Resonance technique by superoxide detection, and antioxidant defences by measurement of Endogenous Peroxidase Activity (EPA). The evolution of two neurotrophins: Brain Derived Neurotrophic Factor (BDNF) and Nerve Growth Factor (NGF) was assessed with an ELISA method. An inflammatory index was determined by a multiplex flow cytometry method. The inflammatory index showed that MCP-1, P-selectin, t-PA and interleukins 6, 8 and 10 levels increased during CPB ($p < 0.05$). Superoxide production and EPA were higher during ischemia and reperfusion than before CPB ($p < 0.05$). BDNF plasma levels were higher at reperfusion ($p < 0.05$). NGF levels did not change. Our study shows an increase of BDNF levels, associated with an inflammatory phenomenon and a redox modification, in the plasma of patients undergoing cardiac surgery under CPB. The role played by this neurotrophin in this complex situation still needs to be elucidated, in particular its cellular origin. It is also necessary to understand whether BDNF has a beneficial or deleterious effect during CPB.

Master Publishing Group
328 N. Moore Avenue, Monterey Park, CA 91754, USA
Tel:1-626-943-7985, Fax:1-626-282-8693, Email editor@ijbs.org

[Feedback](#) | [About IJBS](#) | [Contact Us](#) | [Subscription](#)

Copyright © 2005 by the Master publishing Group