

Abstract

Gender differences in myocardial apoptosis of the patients after heart transplantation

Background: Many functions of the cardiovascular apparatus are influenced by gender. The aim of our study was to find out the sensitivity to perioperative ischemia of the donor female and male myocardium; and determine how the organism affects the donor myocardium of the other sex after heart transplantation (detection of apoptosis), and whether the investigated biomarkers can predict primary graft dysfunction (PGD). **Methods:** The research was divided into three prospective studies. The Study 1 included 81 patients undergoing heart transplantation from September 2010 to January 2013. Patients were divided into two groups according to male allograft and female allograft. In order to prove myocardial necrosis the high-sensitive cardiac troponin T (hs-cTnT) method was used. Apoptosis was determined by immunohistochemical detection of caspase-3, Bcl-2, and by the TUNEL method. The Study 2 included 58 patients divided into four groups according to gender; both of the recipient and the donor. Apoptosis (caspase-3, Bcl-2, TUNEL) was analysed in these groups during the two-year follow-up. In Study 3 64 patients were involved. We investigated the relationship in between these biomarkers and the development of PGD after transplantation. **Results:** We observed a significantly higher level of hs-cTnT in female donors before transplantation ($P=0,025$); as well as in the female allograft group after transplantation throughout the monitored period. In the Study 2, there were no differences in apoptosis between the groups. All groups showed a significant increase of TUNEL-positive myocytes after transplantation ($P<0,001$). In the third study, 14 % of transplant recipients developed PGD. We did not find differences between the groups in regard to hs-cTnT serum levels. There were also no differences in apoptosis between PGD and without PGD groups. **Conclusions:** We found out greater necrotic damage of the myocardium of female donors. During the two year follow-up, we did not observed differences in apoptosis in transplanted hearts which could be attributed to gender of the recipient and the donor. The monitored biomarkers were not predictors of PGD.

Key words: Heart transplantation, apoptosis, gender differences