Effects of Sphingosine-1-Phophate Activation on Protecting Against Testicular Torsion-Detorsion Injury in Rats

Introduction and Objective: Testicular torsion-detorsion is a typical ischemia-reperfusion injury (IRI). Decrease in the inflammatory response induced by reperfusion injury is the main subject to preventing the tissue injury and later consequence. Activation of sphingosine-1-phosphate (S1P) was found to attenuate IRI in many organs by inhibiting lymphocyte egress and reducing inflammatory molecules. We thus speculate that over-expression of S1P can reduce the testicular injury after testicular IRI.
Materials and Methods: Adult male Sprague-Dawley rats were treated torsion-detorsion, torsion-detorsion plus FTY720 (2 or 4 mg/kg), sham, sham plus FTY720 (2, 4 mg/kg) and designated as the T/D, T/D-FTY(2), T/D-FTY(4), sham, or sham-FTY group. FTY720 was given immediately after detorsion or after sham operation. Testicles were harvested at 2 or 24 hours after detorsion to evaluating pro-inflammatory markers and the levels of testicular injury.
Results: The injury scoring system showed that the histological features showed a trend toward a protective effect by FTY720. The myeloperoxidase activity and the concentrations of cytokines, tumor necrosis factor-alpha in testes of the T/D-FTY720 treatment groups were significantly lower than those of the T/D group.
Conclusions: Over-expression of S1P by targeting S1P receptors can reduce the testicular injury after testicular torsion-detorsion.