

The effect of curcumin on NRF2/Keap1 signalling pathway in the epididymis of mouse experimental cryptorchidism

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Abstract

Nrf2/Keap1 pathway, which prevents cellular damage against reactive oxygen species production, is disrupted in epididymis following cryptorchidism. In this study, we aimed to use curcumin (Cur) as an activator of Nrf2 to decrease the effects of disruption in this pathway caused by cryptorchidism. In this study, animals were randomly divided into following groups: control, sham-surgery, sham-vehicle, sham-Cur50, sham-Cur100, cryptorchidism, cryptorchidism-vehicle, cryptorchidism-Cur50 and cryptorchidism-Cur100. For cryptorchidism induction, the left testicle was removed from the scrotum and sutured to the abdominal wall. Two weeks after surgery, Cur was given orally to animals. After 1 month, sperm parameters and testis histopathology were analysed. The expression of Nrf2, NQO1, HO1, and Keap1 genes was evaluated by real-time polymerase chain reaction. Our data showed that Cur, especially at high doses, could improve sperm parameters and testis histopathology, which were damaged following cryptorchidism induction. The expression of HO1, NQO1, and Nrf2 genes, which had decreased in the cryptorchidism group, showed a significant increase after administration of Cur in a dose-dependent manner. Cur, by inducing the expression of genes involved in the Nrf2/Keap1 pathway, could reduce the adverse effects of cryptorchidism and might be used as adjuvant therapy for decreasing cryptorchidism complications before surgery.

KEYWORDS

cryptorchidism, curcumin, Nrf2/Keap1 pathway, sperm parameters, testis