

Title EFFECTS OF METHAMPHETAMINE DEPENDENCE
ON SPERM QUALITY AND ANDROGEN RECEPTOR
EXPRESSION IN SEMINIFEROUS TUBULES AND
LEYDIG CELLS IN RAT TESTIS

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ABSTRACT

Methamphetamine (METH) is an illegal psychostimulant drug that acts on the central nervous system (CNS). In addition, METH has also been reported to have reproductive toxicity as it can induce apoptosis in the seminiferous tubule. Thus, the objective of the present study was to investigate the effect of METH administration on sperm quality, AR expression in the seminiferous tubules and Leydig cells and plasma testosterone levels in male rats.

Twenty four adult male Sprague-Dawley rats were divided into 4 groups. All animals were treated by intraperitoneal (i.p.) injection with saline or METH. The control group was treated with 0.9% saline for 15 days before sacrificed. The AB-METH group was treated with 0.9% saline 3 times per day for 14 days and treated with METH at 6 mg/kg every 2 hours for 4 times on day 15 before sacrificed. The ED-METH group was treated with METH at 0.1-3.9 mg/kg 3 times per day on day 1-13 and treated with METH at 4.0 mg/kg 3 times on day 14 and treated with 0.9% saline every 2 hours for 4 times on day 15 before sacrificed. The ED-METH binge group was treated with METH at 0.1-3.9 mg/kg 3 times per day on day 1-13 and treated with METH at 4.0 mg/kg 3 times on day 14 and treated with METH at 6 mg/kg every 2 hours for 4 times on day 15 before sacrificed. All animals were sacrificed and cauda epididymis and testis were immediately removed. The sperm quality (sperm motility,

sperm morphology and sperm concentration) was evaluated. The expression of AR in the testis and the plasma testosterone levels were measured.

The results of the present study showed that the sperm motility and sperm morphology were significantly decreased after treatment with METH. AR expression was significantly decreased in Leydig cells, round and elongated spermatids.

However, sperm concentration and plasma testosterone levels were not significantly changed after treatment with METH in this study.

In summary, these results support the role of AR expression on spermatogenesis in male reproductive system. In addition, METH administration can cause a decrease of AR expression in the testis that may affect to the spermatogenesis and cause impairment of sperm fertilizing ability.