

## عنوان مقاله:

Voluntary exercise could reduce sperm malformations by improving hypothalamus-hypophysis-gonadal axis and kisspeptin/leptin signaling in type ۲ diabetic rats

## محل انتشار:

مجله علوم پایه پزشکی ایران، دوره 24، شماره 12 (سال: 1400)

تعداد صفحات اصل مقاله: 8

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## خلاصه مقاله:

Objective(s): Most male patients with type ۲ diabetes mellitus (T۲DM) experience infertility. It is well established that regular physical activity could alleviate diabetic infertility symptoms. This study was designed to determine the effect of voluntary exercise on sperm malformation. Materials and Methods: Thirty-two male Wistar rats were randomly divided into control (C), diabetic (D), voluntary exercise (Ex), and diabetic-voluntary exercise (D-Ex) groups. Diabetes was induced by an intraperitoneal injection of streptozotocin (۳۵ mg/kg) followed by a high-fat diet for four weeks. Voluntary exercise was performed by placing the animals in the rotary wheel cages for ten weeks. Sperm malformations were analyzed. Moreover, the hypothalamic leptin, kisspeptin, kisspeptin receptors (KissR), as well as plasma LH, FSH, testosterone, and leptin levels were evaluated. Results: Results showed that induction of T۲DM caused increased sperm malformation, plasma, and hypothalamic leptin as well as decreased hypothalamic kisspeptin, KissR, and plasma LH levels compared with the C group ( $P < 0.001$  to  $P < 0.01$ ). Voluntary exercise in the Ex group increased hypothalamic KissR, plasma FSH, LH, and testosterone levels compared with the C group; however, it decreased sperm malformation and hypothalamic leptin levels ( $P < 0.001$  to  $P < 0.05$ ). Voluntary exercise in the D-Ex group reduced sperm malformation, hypothalamic leptin, and plasma testosterone while elevated hypothalamic kisspeptin and KissR protein levels compared with the D group ( $P < 0.001$  to  $P < 0.01$ ). Conclusion: The results illustrated voluntary exercise reduces sperm malformations by improving the HHG axis and kisspeptin/leptin signaling in rats with T۲DM.

## کلمات کلیدی:

Voluntary exercise, Diabetes, Sperm malformations, Hypothalamus, Hypophysis, Kisspeptin, Leptin

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