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Mechanisms of honey on testosterone levels

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Abstract: Testosterone is an anabolic steroid and the principal sex hormone in males. Maintaining adequate levels of testosterone throughout the life span of male is very desirable, especially it is now well-known that low levels of testosterone is associated with various aging diseases/disorders. Therefore, still, so many research studies have focused on enhancing serum levels of testosterone in males. Here, we intended to systematically discuss and present the impact of honey on serum levels of testosterone in males. This was conducted by searching PubMed, Scopus, and Embase electronic databases for research articles from May 1993 through April 2019 using the keywords "honey" and "honeybee" versus "testosterone". Moreover, references from relevant published articles were also reviewed and cited to frame an integral discussion, conclusion, and future research needs. In conclusion, the collective evidence, which is mainly based on in vivo system studies, reveals that oral administration of honey increases serum testosterone level in males. Mechanistically, honey may increase serum level of testosterone by increasing the production of luteinizing hormone, enhancing the viability of Leydig cells, reducing oxidative damage in Leydig cells, enhancing StAR gene expression, and inhibiting aromatase activity in the testes. However, further research studies on humans, mainly clinical trials, in this specific research approach are still needed to confirm the effect of honey on testosterone.