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Can Renalase Enzyme Play a Role in Resolving the Problem of Erectile Dysfunction?

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Editorial

Erectile dysfunction (ED) is the inability to obtain adequate erection for a successful sexual intercourse or the continuity of the state of not sustaining adequate erection [1]. This is a serious health problem which affects more than 150 million men and their wives worldwide [2] and the population-based survey in Turkish men of ≥40 years of age reported the prevalence of ED as 33% [3]. Erectile dysfunction may be due to organic (hormonal, vascular, neural, cavernosal abnormalities or lesions related) and / or psychogenic factors [1]. However, it should be noted that, high norepinephrine levels, whether chronic or not, cause erectile dysfunction [4]. Norepinephrine; is the primary chemical messenger of the sympathetic nervous system (Prepare the person for fight or flight and stressful situations). When the norepinephrine level peaks, it causes orgasm/ejaculation in men. If chronically high norepinephrine is observed in an individual this can cause anxiety or irritability. Continued high norepinephrine (NE) in the individual may result in adrenal exhaustion, fatigue or adrenal insufficiency. When this condition is not intervened, erectile dysfunction, loss of libido and sexual dysfunction may occur. Also, excessive penile NE level underlies impaired erectile function in adenosine A1 receptor deficient mice [5]. It has been also reported that NE levels in the cavernous and systemic blood increase during sexual arousal in patients with ED might be an indication of a somatic dysregulation in sympathetic transmission or alterations of NE reuptake mechanisms as a cause of impaired erectile function [6].

Hence, it is hypothesized in the editorial that high circulating norepinephrine levels in circulation may be associated with decreased renal levels. Renalase is an enzyme which metabolise dopamine, epinephrine and norepinephrine [7,8]. Renalase is synthesized mainly from the renals, but synthesized in a small amount from other tissues, including the brain [8]. In this case, the renals may cause the renal levels to drop because they cannot perform their physiological functions due to any reason (renal failure or atrophy of renal-expressing cells). In such a case (because of insufficient renalase) norepinephrine cannot be metabolized; persistently elevated norepinephrine may cause

erectile dysfunction, loss of libido due to the above-mentioned reasons [4-6]. On the other hand, chronically elevated norepinephrine may cause high blood pressure. It can also cause renal failure.

As long as the high level of norepinephrine continues for a long time, the level of dopamine produced by the brain may decrease. Decreased dopamine production may decrease the production of testosterone. Falling testosterone level may cause insulin resistance, erectile dysfunction and lack of libido and it may also cause more metabolic events [9]. Also, various studies have demonstrated that the adverse effects of testosterone therapy in type 2 diabetes mellitus, stressing the cardiovascular risks [9].

When we put together all the information above, it is obvious that there is a relation between erectile dysfunction, loss of libido, and renalase levels. It is suggested that retention of renalase at physiological levels may help to prevent some metabolic events such as erectile dysfunction, loss of libido and chronic renal failure.

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