SCHOLASTIC:
Journal of Natural and Medical Education
Volume 2 Issue 4, Year 2023 ISSN: 2835-303X
https://univerpubl.com/index.php/scholastic

Changes in Total Testosterone Levels in Which Treating Diabetic Patients with Tigralis 5

Tilavov Tolibjon Bakhtiyorovich
A master degree of the department of faculty and hospital surgery and urology of the Bukhara State, Medical Institute, Bukhara, Republic of Uzbekistan

Azimov Sardorbek Ilkhomovich
Bukhara State Medical Institute faculty and hospital surgery, urology department assistant, PHD, Bukhara, Republic of Uzbekistan

Gaziyev Karim Umarovich
Bukhara State Medical Institute associate professor of department of faculty and hospital surgery, urology, Bukhara, Republic of Uzbekistan

Article Information

Received: February 27, 2023
Accepted: March 28, 2023
Published: April 29, 2023

Keywords: *testosterone, erectile dysfunction, diabetes mellitus type 2, sexual disorders, Tigralis-5, cardiovascular diseases; testosterone deficiency.*

ABSTRACT

This review of the literature highlights the issues of epidemiology, classification, pathophysiology, as well as the diagnosis and treatment of erectile dysfunction in patients with diabetes mellitus. Erectile dysfunction in young patients with diabetes mellitus is a serious problem due to its fairly wide prevalence, as well as the impact on the psychological state of patients and the quality of life in general. In general, a decrease in the amount of testosterone in patients with diabetes mellitus is associated with a decrease in the hormone insulin in the body. This article mentions a significant increase in total testosterone levels in patients with diabetes mellitus at the post-treatment stage of erectile dysfunction.

Testosterone is a sex hormone that regulates a number of processes in the human body, including fertility, sex drive, bone mass, fat distribution, muscle mass, and red blood cell production. Testosterone levels typically decrease as you age, but for some people, these levels can become too low and cause unwanted symptoms. Diabetes is a condition in which the body is unable to process blood glucose, also known as blood sugar. While a link between low testosterone and diabetes isn't immediately obvious, researchers have discovered that the two are connected. According to the American Diabetes Association (ADA), if you have diabetes, you're twice as likely to have low testosterone as people who don't have diabetes.



Figure 1: Chemical structure of testosterone

© 2023 by the authors; licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/).

The chemical structure of testosterone was first determined in 1953 by Leopold Ruzichka, who received the Nobel Prize in chemistry in 1939 for his work in this direction [17]. (Figure 1)

Metabolic changes in testosterone are achieved by oxidation in the 17th case or by restoring the fusion of the A ring and the 3rd keto group. The first results in 17-ketosteroids that function in many tissues, including the liver [25].

The less effective pathway is found mainly in target tissues and promotes the formation of an active metabolite, dihydrotestosterone (DGT), as well as estradiol and androstenediol. Etiocholanolol and androsterone 5 have β-reduced androgen products[21]. Thus, testosterone is a progormone because it is: firstly, it becomes a more active compound - dihydrotestosterone, and secondly, this change occurs mainly in tissues located outside the testicles. A small portion of testosterone aromatizes to form estradiol, which is especially important for the brain, where it is involved in the formation of sexual desire [11].

Thus, testosterone exhibits many physiological effects, the most important of which are: sexual disposition and strength, aggression and sexual behavior. It should be noted that this endogenous sex hormone, along with androgenic effects (stimulation of the male reproductive apparatus), is able to have a strong anabolic effect on various tissues (muscles, kidneys, liver, uterus), that is, to increase protein synthesis in them [11].

Men with T2DM have erectile dysfunction (ED) due to multiple comorbidities, most notably macro- and micro-vascular disease, autonomic and peripheral neuropathy, depression, and multiple medications in addition to HG [32]. Zitzmann et al [29,33] found that falling testosterone levels significantly impact on ED around 8 nmol/L and Buvat et al [24] described a threshold of 10.4 nmol/L where testosterone therapy might salvage men who fail with phosphodiesterase type 5 (PDE5) inhibitors. Men with T2DM also have significantly reduced responses to conventional ED therapy, due to multiple comorbidities [25]. Hackett et al [3,36] screened a UK population of men with T2DM and found that the impact of HG on ED was greatest in men with TT below 8 nmol/L, in agreement with the findings of Zitzmann et al [33]. These findings suggest that there are pitfalls in drawing conclusions from studies of testosterone therapy where men with T2DM form only a minor subgroup. Correcting the low testosterone levels will usually only address the ED burden due to HG but still leave the impact due to other comorbidities [36], which will need to be addressed by additional specific therapies [36]. Some trials only evaluated ED using international index of erectile function-5 (IIEF-5), which only evaluates erections, whereas testosterone is involved in desire, sexual frequency, orgasm, ejaculation, sensation, and sexual satisfaction [77].

Materials and methods. 66 men aged 45-60 (average age 50.4+1.3) were under our control. All patients had elevated blood sugar levels.

Tests performed: physical examination, complete blood count and urine test, glucose tolerance test, total testosterone level, thyroid stimulating hormone (TSH), laser Doppler penile flowmeter, IIEF (International Index of Erectile Function) and ICF (International activity classification) questionnaires.

All patients were prescribed Tigralis-5 1 tab x 1 time to correct ED every day for 28 days. It should be noted that the patients were included in the survey before complaining about the presence of violations in the genital area, they considered the existing violations as "normal" for their work and work routine, and did not consult a urologist themselves. accompanied by an increase in blood sugar.

Studies conducted at symmetric points were evaluated after calculating the average statistic and reflected the basal blood flow rate at 2 points for 2 minutes. The curves were processed immediately after each study using the software. The criteria of adequate blood flow to the penis

© 2023 by the authors; licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/).

were determined based on the results of a survey of a control group of 15 healthy volunteers aged 25-35 without complaints of erectile dysfunction.

Results. All patients had a total testosterone level in the normal range, an androgen index > 70%. Patients with arterial hypertension were excluded from the study and referred to a cardiologist for correction of their condition. It was 23.3+2.4 points in the examined patients. At the same time, the erectile component was 3.2 +1.8 points, the copulatory function was 4.5 +1.5 points in general, and the psychogenic component was 4.3 + 2.6 points. According to the IIEF scale, the maximum score is 75; 46.6+4.8 points in examined patients. These data are consistent with mild to moderate erectile dysfunction. Evaluation of microcirculation study results in baseline and follow-up patients. Therefore, the presence of ED in all patients was proved, which was confirmed in addition to the subjective assessment according to the IIEF and ICF questionnaires scored, by objective data: revealed microcirculation disorders of the cavernous bodies of the penis, the presence of endothelial dysfunction. In the control after 1 month, according to the questionnaires, the total score of the ICF increased and reached normal values – up to 38.4 + 1.8, the indicators for erectile, copulative and psychogenic components increased by more than 2 times, the total score for IIEF approached the maximum of 59, 8+2.4. The total amount of testosterone was shown to be 4.7+1.3 before treatment. We can see that the indicator of the total amount of testosterone in the blood after treatment has increased significantly by 6.1+1.7.

Discussions. Thus, our patients have stress-induced erectile dysfunction, endothelial dysfunction, microcirculation disorders. The use of the drug Tigralis 5, subject to correct insulin therapy (keeping blood sugar figures not higher than 6.0 mmol / l.), helps to compensate for erectile dysfunction, improve microcirculation. There is no doubt about the relationship between the onset and course of erectile dysfunction in patients with cardiovascular pathology, the severity of endothelial dysfunction, and, as one of its manifestations, diabetes mellitus.

Conclusions. Treatment of ED in patients with DM should be comprehensive and aimed not only at improving erectile function itself, but also at eliminating pathogenetic factors in the development of ED, such as chronic hyperglycemia, dyslipidemia, androgen deficiency. Currently, preference is given to drug treatment methods, the leading place among which is occupied by drugs from the group of PDE-5 type inhibitors due to their high efficiency, safety and ease of use for patients. It should be noted that thedrugs of this group have a neuroprotective effect, which is especially important for patients with theneurogenic form of ED. However, this issue requires further in-depth study. Thus, despite greatadvances in the development of methods for diagnosing and treating ED, there are still many unresolved issues that require further research.

Literature

1. International Diabetes Federation (Internet) Cited 2013 Dec 9. //www.idf.org.worlddiabetesday/tool kit/gh/facts-figures.
2. Elchaninova S.A., Makarenko V.V. Relevance, prospects, problems of laboratory assessment of epithelial dysfunction in chronic diseases of the circulatory system./Clin.lab.cons., 2009, No. 2: 39-47.
3. Kuropatkin A.N., Sidorov V.V. Laser Doppler flowmetry of blood microcirculation. Guide for doctors. M.: OAO Publishing House, Medicine, 2005; 256.
4. Neimark A.I., Neimark B.A., Tishchenko G.E. A variant of correction of stress-induced erectile dysfunction in patients with diabetes mellitus./ Experimental and Clinical Urology, 2012, No. 4: 58-62.

© 2023 by the authors; licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/).

5. Rozhivanov, R.V. Erectile dysfunction in patients with diabetes mellitus according to control and epidemiological studies /R.V.Rozhivanov, Yu.I. Suntsov, D.G. Kurbatov// Diabetes mellitus. -2009. No. 2-S.51-54.
6. Azimov S.I., Gulamov M.X., Karimov B.S. Kompleksnoe patogeneticheskoe treatment of patients with diabetes mellitus, complicated by erectile dysfunction // Vestnik nauki I obrazovaniya, 2020. No 23-2 (101)
7. Azimov S.I., Gulamov M.X., Karimov B.S.U. Rol universalnogo urologicheskogo voprosnika v monitoringe urologicheskoy patologii u bolnyx tuberkulezom // Vestnik nauki i obrazovaniya,
2020. No 23-2 (101).
8. Azimov S.I., Rashidov Z.R. The Role of the Universal Urological Questionnaire in the Screening of Urological Pathology in patients with Tuberculosis // American Journal of Medicine and Medical Sciences 2020, 10 (10): pp.769-772 [http://creativecommons.org/licenses/by /4.0/]
9. Azimov S.I. The Effectiveness of the Universal Urological Questionnaire in the Screening of Urological Pathology in patients with Tuberculosis // International Engineering journal for research and development (IEJRD) Vol.5, Speical Issue 9 (2020) №: -2349-0721 pp.1-3
10. Azimov S.I., Rashidov Z.R., Mukhtarov Sh.T. Vozmojnosti lechebno-profilakticheskoy taktiki pri dobrokachestvennoy giperplazii prostaty u bolnyx tuberkulozom // Tuberkulyoz i bolezni lyogkix, Tom 99, № 7, 2021. S.26-30
11. Azimov S.I., Rashidov Z.R., Mukhtarov Sh.T. Current international standards for monitoring lower urinary tract symptoms and sings of benign prostatic hyperplasia and tuberculosis patients // Journal of Natural Remedies Vol.22, №.1 (2), (2021) pp.117-123 [https: // jnronline. com / ojs / index.php / about / article / view / 908]
12. Azimov S.I., Rashidov Z.R., Mukhtarov Sh.T. Monitoring Symptoms of Lower Urinary Tract other Features of Benign Hyperplasia of Prostate in Patients With Tuberculosis // European Journal of Molecular & Clinical Medicine Vol.07, Issue 03 2020 pp.1534-1540
13. Azimov S.I. Universal urolog so'rovnomasining sil kasalligi bilan kasallangan bemorlarning urolog patologiyasini tekshirishdagi o'rni // «Tibbiyotda yangi kun» ilmiy referativ, manaviy ma'rifiy zhurnal №3 (31), 2020. S.238-241
14. Azimov S.I., Rashidov Z.R. Effektivnost' universal'nogo urologicheskogo voprosanika v skrininge urologicheskoy zabolevayemosti tuberkulezom // «Uzbekiston vrachebnayaassotsiatsiya» nauchno – prakticheskiy zhurnal № 4, 2019 S.103-107
15. Tilavov, T. B. (2022). Sexual Dysfunction of Men in Bukhara Region. INTERNATIONAL JOURNAL OF HEALTH SYSTEMS AND MEDICAL SCIENCES, 1(5), 19-22.
16. Тилавов, Т. Б. (2021). ЭРЕКТИЛЬНАЯ ДИСФУНКЦИЯ У БОЛЬНЫХ САХАРНЫМ ДИАБЕТОМ 1 ТИПА: МЕТОДЫ ДИАГНОСТИКИ И ЛЕЧЕНИЯ.// НАУКА И ИННОВАЦИИ - СОВРЕМЕННЫЕ КОНЦЕПЦИИ сборник научных статей по итогам работы //Международного научного форума. Москва, 2021
17. Corona G, et al. (2015). Testosterone replacement therapy and cardiovascular risk: A review. *ncbi.nlm.nih.gov/pmc/articles/PMC4709429/*
18. Haider KS, et al. (2020). Remission of type 2 diabetes following long-term treatment with injectable testosterone undecanoate in patients with hypogonadism and type 2 diabetes: 11-year data from a real-world registry study. *dom-pubs.onlinelibrary.wiley.com/doi/full/10.1111/dom.14122*

© 2023 by the authors; licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/).

19. Kapoor D, et al. (2006). Testosterone replacement therapy improves insulin resistance, glycaemic control, visceral adiposity and hypercholesterolaemia in hypogonadal men with type 2 diabetes. *eje.bioscientifica.com/view/journals/eje/154/6/1540899.xml*
20. Low testosterone. (n.d.). *diabetes.org/healthy-living/sexual-health/low-testosterone*
21. Lutz S, et al. (2019). Sex-specific associations of testosterone with metabolic traits. *frontiersin.org/articles/10.3389/fendo.2019.00090/full*
22. Mulhall J, et al. (2018). Evaluation and management of testosterone deficiency: AUA guideline. *auajournals.org/doi/10.1016/j.juro.2018.03.115*
23. Navarro G, et al. (2016). Extranuclear actions of the androgen receptor enhance glucose-stimulated insulin secretion in the male. *cell.com/cell-metabolism/fulltext/S1550-4131(16)30118-8*
24. Pal M, et al. (2019). Testosterone supplementation improves insulin responsiveness in HFD fed male T2DM mice and potentiates insulin signaling in the skeletal muscle and C2C12 myocyte cell line. *doi.org/10.1371/journal.pone.0224162*
25. Spanos C, et al. (2020). Effects of gender-affirming hormone therapy on insulin resistance and body composition in transgender individuals: A systematic review. *ncbi.nlm.nih.gov/pmc/articles/PMC7061235/*
26. van Velzen D, et al. (2021). Incident diabetes risk is not increased in transgender individuals using hormone therapy. *ncbi.nlm.nih.gov/pmc/articles/PMC9016430/*
27. Yao Q, et al. (2018). Testosterone level and risk of type 2 diabetes in men: A systematic review and meta-analysis. *ncbi.nlm.nih.gov/pmc/articles/PMC5793809/*
28. Hackett GI, Cole NS, Deshpande AA, Popple MD, Kennedy D, Wilkinson P. Biochemical hypogonadism in men with type 2 diabetes in primary care practice. Br J Diabetes Vasc Dis 2009;9:226-31.
29. Goodman N, Guay A, Dandona P, Dhindsa S, Faiman C, Cunningham GR, et al. American Association of Clinical Endocrinologists and American College of Endocrinology position statement on the association of testosterone and cardiovascular risk. Endocr Pract 2015;21:1066-73.
30. Bhasin S, Brito JP, Cunningham GR, Hayes FJ, Hodis HN, Matsumoto AM, et al. Testosterone therapy in men with hypogonadism: an endocrine society guideline. J Clin Endocrinol Metab 2018;103:1715-44.
31. Corona G, Rastrelli G, Maggi M. Diagnosis and treatment of late-onset hypogonadism: systematic review and meta-analysis of TRT outcomes. Best Pract Res Clin Endocrinol Metab 2013;27:557-79.
32. Kelly DM, Jones TH. Testosterone: a vascular hormone in health and disease. J Endocrinol 2013;217:R47-71.
33. Selvin E, Feinleib M, Zhang L, Rohrmann S, Rifai N, Nelson WG, et al. Androgens and diabetes in men: results from the Third National Health and Nutrition Examination Survey (NHANES III). Diabetes Care 2007;30:234-8.
34. Haffner SM, Shaten J, Stern MP, Smith GD, Kuller L. Low levels of sex hormone-binding globulin and testosterone predict the development of non-insulin-dependent diabetes mellitus

© 2023 by the authors; licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/).

in men. MRFIT research group. Multiple risk factor intervention trial. Am J Epidemiol 1996;143:889-

35. Ding EL, Song Y, Manson JE, Hunter DJ, Lee CC, Rifai N, et al. Sex hormone-binding globulin and risk of type 2 diabetes in women and men. N Engl J Med 2009;361:1152-63.
36. Corona G, Monami M, Rastrelli G, Aversa A, Tishova Y, Saad F, et al. Testosterone and metabolic syndrome: a meta-analysis study. J Sex Med 2011;8:272-83.
37. Stellato RK, Feldman HA, Hamdy O, Horton ES, McKinlay JB. Testosterone, sex hormone-binding globulin, and the development of type 2 diabetes in middle-aged men: prospective results from the Massachusetts male aging study. DiabetesCare 2000;23:490-4
38. The Value of TIGRALIS 5 in the Treatment of Patients with Diabetes Mellitus Complicated by Erectile Dysfunction //A.S Ilkhomovich, T.T Bakhtiyorovich - Research Journal of Trauma and Disability Studies, 2022
39. CARDIOVASCULAR DISEASE AMONG ARAL SEA REGION POPULATION// I.I. Khamdamov, T.B Tilavov - European journal of molecular medicine, 2023

© 2023 by the authors; licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0/).