



Evaluation of the hepatic funciotn of adult men under the use of testosterone base transdermal in the municipality of Belo Horizonte – MG / Brazil

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Abstract

Introduction: Recently, an expressive interest has developed about the importance of the condition known as male climacteric or andropause. In men this process is not universal, occurring in a portion of the male population with clinical manifestations that are more gradual than those occurring in menopausal women. **Objective:** The present study aimed to evaluate the hepatic function of adult men under testosterone transdermal use in the city of Belo

Horizonte – MG / Brazil. **Methods:** The subjects of the research were men, patients of the Penchel Clinic admitted in 2017. As inclusion criteria, men would need to be between 19 and 55 years of age and total testosterone measured at values below 320ng / dl, which would characterize hormone insufficiency. After 60 days of hormone use, the men underwent biochemical reassessment for analysis of testosterone values. **Results:** Because it is a rapid absorption, short half life and non-return liver, this route of replacement becomes an excellent alternative of choice for testosterone in 100% of the subjects ($p = 0.0441$), suggesting that there was no statistically significant difference between the two measures evaluate GGT, the main acute marker of hepatic lesion alteration. **Conclusion:** Care for testosterone-deficient patients should focus on accurate assessment of total testosterone levels, symptoms and signs, as well as appropriate monitoring during treatment to ensure that therapeutic levels of testosterone are achieved and symptoms are improved.

1. Introduction

Testosterone is responsible for secondary sexual characteristics, sexual desire and erection. In addition, it increases the metabolic processes in muscles, bones, bone marrow, immune system and brain. Therefore, a reduction in the level of testosterone leads to symptoms that are caused by the reduction of these processes. According to Lund et al. (1999), total testosterone levels in males consist of three parts: (a) testosterone that binds strongly to SHBG (sex hormone binding globulin); this accounts for almost 80% of total testosterone and serves as a reserve source; (b) testosterone also binds to albumin, however this binding is weak and readily available; (c) and free testosterone.

The declining levels of testosterone in elderly men are believed to underlie many of the symptoms and diseases of recruitment, however, studies demonstrating low-risk associations with clinical outcomes are few in number. Aiming to examine the association of endogenous testosterone levels with mortality in elderly men in

the community, Gail et al. (2008) conclude at the end of their study that testosterone insufficiency in elderly men is associated with an increased risk of death over 20 years regardless of multiple risk factors and pre-existing health conditions.

According to Mulhall et al. (2018) care of testosterone deficient patients should focus on accurate assessment of total testosterone levels, symptoms and signs, as well as appropriate monitoring during treatment to ensure that therapeutic levels of testosterone are achieved and symptoms are improved.

Due to the innumerable and relevant functions that the liver plays in the direct and indirect way in the organism, several techniques were developed to measuring performance, as well as pointing out possible injuries in this body. In

according to Thrall et al. (2015) hepatic abortion tests should be divided into tests that measure hepatocyte damage, which detect cholestasis and finally those who evaluate liver function. Hepatocyte lesions are detected by measu-

ring serum enzymes released from hepatic cellular disruption, extent, magnitude and course (acute or chronic) of the lesion.

2. Materials and Methods

2.1. Nature of Research

This is a descriptive, quantitative and qualitative, observational study carried out in the medical records of the Penchel Clinic, in order to analyze the rate of transdermal hormone replacement.

According to Pereira (2012) in observational studies, there is no intervention performed by the investigator, what happens is the investigation of situations that occur normally. According to Gil (2010), descriptive research aims to describe the characteristics of a population or a phenomenon, or to establish relations between variables.

The mixed method procedure suits the need to gather both quantitative and qualitative data in a study, expanding the discussion of the need for a research to explore and at the same time explain the phenomena studied.

2.2. Ethical Aspects

The project was evaluated and approved by the Ethics Committee of Potiguar University, under the number of opinion 3,113,829. The data collection was done in the medical records of the Penchel Clinic, after approval by the committee, obeying the norms of Resolution 466, of December 12, 2012, of the National Health Council (CNS).

Access to research data was made after the signature of the data commitment, with a commitment to respect the privacy and confidentiality of the data, preserving the anonymity of the subjects, as well as to use the materials and data collected exclusively for research purposes and should be published to the local community and in the means of disseminating scientific papers. The data were collected after authorization of the institution, through the signing of the letter of consent and the authorization of the institution for file use.

2.3. Period and field of study

The study was carried out during

the year 2018, from the data collection stages to the final writing of the work. The research was carried out in the medical files of the Penchel Clinic in the city of Belo Horizonte – MG / Brazil.

2.4. Research Subjects

The subjects of the survey were men, patients of the Penchel Clinic admitted in 2017. As inclusion criteria, men would need to be between 19 and 55 years old and total testosterone measured in values lower than 320ng / dl, which would characterize hormone insufficiency.

As exclusion criteria are men with age that differ from the intended range, in addition to total testosterone levels higher than defined.

2.5. Testing for testosterone use

It was verified in medical records that all the men in this study used a bioidentical testosterone base at 2% (20mg) on a transdermal gel, twice a day.

The guidelines for using testosterone were as follows: cream should be given by the patient on

clean, dry, healthy and hairless skin twice a day in the internal arm or thigh or abdomen, in unidirectional application, without rubbing the region of application. After 60 days of hormone use, the men underwent biochemical reassessment for analysis of testosterone values.

2.6. Sampling

The sample was defined from the calculation of simple random sampling, considering a 95% confidence interval and 5% margin of error and a universe of 49 men.

2.7. Collection and analysis of data

A total of 41 charts were analyzed at the Penchel Clinic during the months of July and August of 2018. The mean age of the study participants was 36 years, so that the youngest was 19 years old and the oldest 55 years, according to previously included inclusion criteria settled down.

Statistical analysis of the data related to the changes in testosterone levels were submitted to a sig-

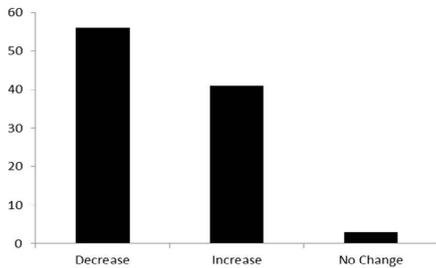
nificance analysis obtained by the t test, bilateral, paired with 95% confidence interval. The values were analyzed and obtained in Microsoft Excel® software. Considering the biases associated with studies of this nature, the mean values of each analysis are presented and only then the significance value between these two analyzes. The lower the value of p, statistically speaking, the more reliable the variation between the analyzed numbers.

3. Results

In the analysis, 24 patients had reduced levels, 15 increased plasma levels of the enzyme and 2 patients did not present alterations. Graph 1 below demonstrates the change profile of TGO with the use of transdermal testosterone in percent.

The mean value of TGO before transdermal T gel use was 32.03ng / dL, while the mean value found in the second analysis, after gel use, was 25.05ng / dL ($p = 0.0535$). Value of $p = 0.05$ suggests that there was no statistically significant variation between

the two measures.

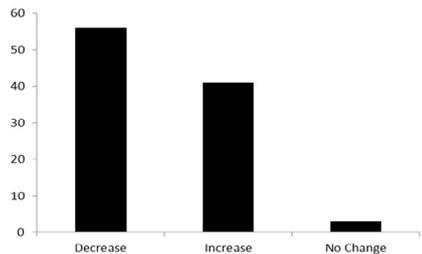


Graph 01: Change profile of the TGO by percentage of the number of patients.

Regarding the TGP values, according to graph 2, the change profile with the use of transdermal testosterone, in percentage, was the following: 56% reduced TGP levels, 41% had their levels increased while 3 % did not show changes. In the analysis, 23 patients had reduced levels, 17 increased plasma levels of the enzyme and 1 patient did not present alteration.

The mean value of TGP before the use of T transdermal gel was 41.69 ng / dL, while the mean value found in the second analysis after gel use was 30.84 ng / dL ($p = 0,0905$). Value of $p > 0.05$ suggests that there was no statistically significant variation between the two measures, although the mean varied in protective condition,

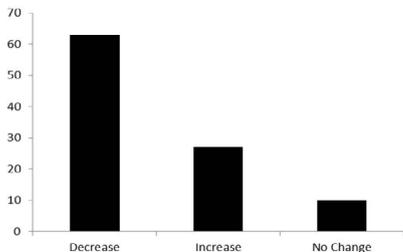
once it was reduced, remaining within the reference values.



Graph 02: Change profile of TGP by percentage of the number of patients.

Regarding the GT Range, according to graph 3, the profile of change with the use of transdermal testosterone was as follows: 63% reduced the levels of TGO, 27% had their levels increased while 10% did not present any alterations.

The mean value of GGT prior to the use of T transdermal gel was 31.95ng / dL, while the mean value found in the second analysis after gel use was 26.26ng / dL ($p = 0.0441$). Value of $p < 0.05$ suggests that there was a statistically significant variation between the two measures.



Graph 03: Change profile of GGT by percentage of the number of patients.

GGT is a sensitive marker of hepatobiliary cholestasis and alcohol consumption, and GGT levels may rise during use of steroids and other medications.

TGO is also present in muscle and heart cells, whereas TGP is found almost only within the liver cells. TGP is therefore much more specific for liver diseases than TGO. TGP is usually slightly larger than TGO. The use of some drugs courses with elevation of GT Range, an enzyme present in the biliary tract. Injury to the cells of these pathways promotes emptying of these and release of enzymes into the bloodstream.

4. Discussion

Many studies have already established an association

between hepatic steatosis levels of testosterone. Hua et al (2014) established that in Korean men of the T-level is inversely correlated with the risk of steatosis. Similarly, men with hepatic steatosis have been reported have lower levels of T.

In this study, it was possible to perceive that the majority of the men who study with altered liver markers, they did regulate their markers, maintaining within the reference values stipulated by the laboratory, establishing a significant positive relation between the use of T and improvement of the function hepatic. Therefore, the research findings, as well as the findings of Yang et al (2018) suggest that physiological elevation of T levels may reduce the risk of Hepatic steatosis.

It is a consensus in the literature that testosterone replacement in deficiency improves not only the laboratory parameters, but also the and clinical picture, and this was the main factor that stimulated the patients to seek a change in lifestyle. During this study observational study, was collected in clinical anamnesis,

food withdrawal reports hypercaloric, industrialized, as well as the introduction of physical activity by at or at least 150 minutes per week, which conduct in association with the treatment, made it possible to lose weight.

Yim et al (2018) reported, in a study involving 1,951 men, that the suspicion of hepatic lesions and non-alcoholic steatosis is inversely correlated with the sex-specific testosterone quartiles in men and women. Low levels of total testosterone were associated with progressively higher levels of onset of reported conditions. In addition, it has been reported that adjustments of age, and others that reduce metabolic risks are associated with the use of testosterone replacement therapy in the improvement of indicators in the study, corroborating the findings of this research.

Some subjects presented elevation in one of the liver markers and only one of them presented elevation in the three markers. Nevertheless, they have remained within the reference values.

Considerations about factors such as age, smoking, alcohol

consumption and physical activity and use of medications, was searched in medical records for findings justifications for the findings.

All these factors were found for most patients, especially for those who had GGT altered. GGT is a marker of hepatobiliary cholestasis and alcohol consumption. GGT levels can medication, such as anti-convulsants, analgesics and anti-inflammatory drugs.

Even beyond these issues, during the collection of data from patients submitted to hepatic dosing, it was identified that the preparation was not performed adequate for the collection of the test, such as alcohol withdrawal for a period of 72 hours in addition to the suspension in the use of medicines that have a direct impact on transaminases, because they have hepatotoxic potential, as already related.

5. Conclusion

The study allowed to evaluate the liver function of the research subjects, concluding and confirming that the transdermal route effectively preserves liver

health, in addition to by associated conditions, to optimize their functions, since, reduced Body mass index of the subjects, the levels of the TGO, TGP and GGT markers reduced in absolute majority. It was also possible to conclude that the transdermal route is safe for administration of testosterone, and unlike the oral or injectable route, it is not hepatotoxicity or risk of hepatic overload, evidence of this was that the patients who had the highest testosterone elevation, showed improvement of levels of GGT. In addition to all these advantages, the easy handling of the path optimizes adhesion since the subjects recognize that the use is practical, painless, without risk of local infection with fewer side effects.

Conflict of Interest Statement

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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