



Journal of Nursing

Revista de Enfermagem

UFPE On Line

ISSN: 1981-8963

INTEGRATIVE LITERATURE REVIEW ARTICLE

MALE HYPOGONADISM OR ANDROPAUSE: INTEGRATIVE LITERATURE REVIEW STUDY

HIPOGONADISMO MASCULINO OU ANDROPAUSA: ESTUDO DE REVISÃO INTEGRATIVA DA LITERATURA

EL HIPOGONADISMO MASCULINO O ANDROPAUSIA: ESTUDIO DE REVISIÓN INTEGRATIVA DE LA LITERATURA

Márcio Cristiano de Melo¹, Amanda Nathale Soares², Daniella Yamada Baragatti³

ABSTRACT

Objective: analyzing the literature about male hypogonadism or andropause. **Methodology:** it is an integrative review with search in LILACS, SciELO and MEDLINE databases to answer the following research question: << with the launching of the campaign from the Brazilian Ministry of Health on the attention to the men's health, are the national publications about male hypogonadism or andropause bringing relevance and improvement on this issue for healthcare professionals? >> **Results:** 81.4% of the papers are in MEDLINE and 76.09% were published in English. There was a greater volume of publications in the period between 2000 and 2004, totaling 42.22%; regarding the type of publication, we found that over 90% of them were medical journals, in their great majority, North Americans. **Conclusion:** there are not many national publications that describe the male hypogonadism or andropause and it is necessary to conduct a differentiated gaze to this issue, for enrichment of knowledge by healthcare professionals. **Descriptors:** Andropause; Men's Health; Hypogonadism; Testosterone; Androgens.

RESUMO

Objetivo: analisar a literatura acerca do hipogonadismo masculino ou andropausa. **Metodologia:** revisão integrativa com busca nas bases de dados LILACS, SciELO e MEDLINE para responder à seguinte questão de pesquisa: << Com o lançamento da campanha do Ministério da Saúde sobre a atenção à saúde do homem, as publicações nacionais a respeito do hipogonadismo masculino ou andropausa estão trazendo relevância e aprimoramento sobre esse assunto para os profissionais da saúde? >> **Resultados:** 81,4% dos artigos estão na MEDLINE e 76,09% foram publicados em inglês. Houve maior volume de publicações no período entre os anos 2000 e 2004, totalizando 42,22%; com relação ao tipo de publicação, verificou-se que mais de 90% delas foram publicações médicas, em sua grande maioria, Norte-americanas. **Conclusão:** não existem muitas publicações nacionais que descrevam o hipogonadismo masculino ou andropausa e que é necessário um olhar diferenciado para o assunto, para enriquecimento do conhecimento por parte dos profissionais da saúde. **Descritores:** Andropausa; Saúde do Homem; Hipogonadismo; Testosterona; Androgênios.

RESUMEN

Objetivo: analizar la literatura sobre el hipogonadismo masculino o andropausia. **Metodología:** una revisión integrativa con una buscar en las bases de datos LILACS, SciELO y Mediline para responder a la siguiente pregunta de investigación: << Con el lanzamiento de la Secretaría de Salud la atención de la salud del hombre, las publicaciones nacionales en materia de hipogonadismo masculino o andropausia están trayendo pertinencia y mejoramiento sobre este tema para los profesionales de la salud? >> **Resultados:** 81,4% de los artículos están en MEDLINE y 76,09% fueron publicados en inglés. El mayor volumen de publicaciones fue en el periodo entre los años 2000 y 2004 totalizando 42,22%, con respecto al tipo de publicación, se encontró que más del 90% de ellos eran las publicaciones médicas, en su mayoría, Norte Americanas. **Conclusión:** no existen muchas publicaciones nacionales que describen el hipogonadismo masculino ni andropausia y que es necesario, una perspectiva diferente para el tema para el enriquecimiento de los conocimientos por parte de los profesionales de salud. **Descriptores:** Andropausia; Salud del Hombre; Hipogonadismo; Testosterona; Andrógenos.

¹Post-Graduated Nurse of the Specialization Course in Collective Health of the Nursing School from Universidade Federal de Minas Gerais/UFMG. Belo Horizonte (MG), Brazil. E-mail: enf.marciomelo@gmail.com; ²Nurse, Master's Student in Nursing from Universidade Federal de Minas Gerais/UFMG. Belo Horizonte (MG), Brazil. E-mail: mandinha0708@yahoo.com.br; ³Nurse, Master's Student in Psychiatric Nursing from EERP/USP. Ribeirão Preto (SP), Brazil. E-mail: danybaragatti@gmail.com

INTRODUCTION

Male hypogonadism, or andropause, was first described in 1939, and it was characterized as the decline in plasma testosterone in men over 50 years. From the 1960s, advances in researches with regard to male hypogonadism confirmed this finding and identified a reduction of blood perfusion in the testicles, with a significant reduction in testosterone synthesis. At that stage, in 15% of cases, it arises symptoms such as: loss of sexual interest; erection problems; lack of concentration; hair fall and weight gain, irritability and insomnia.¹

The study of the andropause symptoms enquires whether it would be fiction or fact that the term “andropause”, such as menopause, implies a state of hormone deficiency secondary to gonadal failure and, like these two terms, tends to give some credence to the unproven andropause.²

All hormone replacement strategies were bent on, primarily, for the treatment of menopausal women. However, the use of hormone replacement therapy with testosterone for the treatment and prevention of andropause has gained the interest of researchers and clinicians.³

The little evidence of male hypogonadism should not be ignored, but used to perform a better diagnosis.⁴ Besides a history and suitable physical examination, health professionals have several options to reach a diagnosis of male hypogonadism, such as questionnaires and biochemical assessment of the peripheral blood.⁵ By highlighting a fresh approach with good studies taking into account the answers we long for all.⁶

The use of androgenic replacement therapy in hypogonadic men is well documented, especially since the restoration of testosterone concentrations within normal limits keeps sexual characteristics, willingness, humor, development of muscle mass and increase in bone mass. Nonetheless, hormone replacement therapy in late male hypogonadism (andropause) remains controversial.⁷⁻⁸

In men, there is a gradual and progressive decline in serum levels of testosterone with aging, which is accentuated by age, associated comorbidities, medications, and malnutrition.⁷ Similar changes occur in young people with hypogonadic androgenic deficiency and are improved with hormone replacement therapy. After the release of topical preparations of testosterone, in 2000, there was a 67% increase in prescriptions,

although the testosterone replacement (androgen) is suggested to combat the andropause symptoms, however, its very existence has been questioned.⁹

The potential benefits of androgenic replacement therapy are associated with restoration of bone mass, muscle strength and body composition, the restoration of libido and sexual function, improvement in humor, life quality, cognitive functions and influence on the metabolism of carbohydrate and lipids. As for the potential risks of treatment, they refer to exacerbation of undiagnosed prostate disease, increased risk of cardiovascular disease, polycythemia, hepatotoxicity and worsening or onset of sleep apnea.¹⁰

Thus, we have stipulated as a matter of study: with the launching of the campaign from the Brazilian Ministry of Health on the attention to the men’s health, are the national publications about male hypogonadism or andropause bringing relevance and improvement on this issue for healthcare professionals? Researching in the available literature on the male hypogonadism or andropause, from a perspective on new concepts, brings important subsidies to develop strategies aimed at answering the male population in all healthcare services. In this sense, this literature review allows glimpsing of the possible specific impairments of men, thus guiding parameters that increase the male welfare.

OBJECTIVE

- Analyzing the literature about male hypogonadism or andropause.

METHOD

We performed an integrative literature review based on the terminology enrolled in the *Descritores em Ciências da Saúde* (DeCS) by the Virtual Health Library, developed from the Medical Subject Headings (MeSH) of the U.S. National Library of Medicine, which allows the use of common terminology in Portuguese, English and Spanish. The descriptors used in this study were: andropause, men's health, hypogonadism, testosterone and androgens, being that andropause, hypogonadism and men’s health were used together and the others were used separately.

We analyzed the LILACS (Latin American and Caribbean Health Sciences), SciELO (Scientific Electronic Library Online) and MEDLINE (Medical Literature Analysis and Retrieval System Online) databases and

selected references relevant to the survey of results before the proposed objectives.

The selection of papers was based on the following inclusion criteria: the papers should be indexed in the databases consulted and have been published between the years 1990 and 2010, the publications should be in the following languages: English or Brazilian Portuguese, both the books and papers should be related to the theme of male hypogonadism or andropause.

After careful reading of the material, we performed a review on the identification of male hypogonadism, its causes, diagnostic and treatment forms. Thus, from the search of papers, we obtained a total of 80 references, including books, editorials, sites and scientific papers. After selection, they totalled 46 papers by meeting the established inclusion criteria.

80 references were found, among them, 45 abstracts, 30 full papers, one editorial and four books. Among those found, we selected 45 references for final use, and 35 references that had no relevance to the study were discarded, since they did not bring relevant information to the review that sought to reflect the impact of male hypogonadism throughout the process of senescence and also

in the lifestyle of the male population. For data collection form, we used a registration form, which was applied to all selected papers from the final sample of this study. This form was able to group information about the authors of the paper; source of publication; year of publication; language; type of publication; country of origin; objectives; methodology; discussion; results and conclusions.

RESULTS AND DISCUSSION

Of the 45 selected papers and that were published in the period, most are indexed in the MEDLINE database (81.4%), although all papers indexed in the SciELO database (13.95%) are also included in the LILACS database (4.65%). Information from which one can deduce that for researching on the theme “male hypogonadism” or “andropause”, the MEDLINE database has higher efficiency and exclusivity in most publications. Table 1 presents a quantitative analysis of publications selected for this study according to the periodical of publication. According to the analysis, we found that 24.44% of the publications were published by The Journal of Clinical Endocrinology and Metabolism.

Table 1. Number of publications by journal

Name of the journal	Nº of Publications	
	n	%
Arquivos Brasileiros de Endocrinologia & Metabologia	02	4,44
Best Practice & Research: Clinical Gastroenterology	01	2,22
Biology of Reproduction	01	2,22
BJU International	01	2,22
British Journal of Urology	01	2,22
Capítulo de livro	01	2,22
Ciência & Saúde Coletiva	01	2,22
Clinical Endocrinology	01	2,22
Endocrinology	01	2,22
Endocrinology and Metabolism Clinics of North America	01	2,22
European Journal of Endocrinology	01	2,22
Human Reproduction Update	01	2,22
JAMA: The Journal of the American Medical Association	01	2,22
Journal of Clinical Encology	01	2,22
Journal of Endocrinological Investigation	01	2,22
MATURITAS	01	2,22
Postgraduate Medical Journal	01	2,22
Publicação de Internet	01	2,22
Publicação Intitucional - Ministério da Saúde	01	2,22
Revista Brasileira de Enfermagem	01	2,22
Revista da Associação Médica Brasileira	03	6,67
Revista de Enfermagem da UFPE	01	2,22
Springer	03	6,67
The Aging Male	01	2,22
The Journal of Clinical Endocrinology and Metabolism	11	24,44
The Journal of Clinical Investigation	01	2,22
The Journal of Sexual Medicine	01	2,22
The Journal of Urology	01	2,22
The New England Journal of Medicine	01	2,22
The Journal of Gerontology	01	2,22
Total	45	100

Regarding the language of publication, we found that 76.09% of the selected publications were written in English and 19.57% have been posted in Brazilian Portuguese, which shows that healthcare Brazilian professionals still have not such knowledge, or, they do not feel attracted to the issue, to the point of

producing significant works involving male hypogonadism or andropause.

When analyzing the publication over the period chosen for this current study, we found that 42.22% of the papers were published between 2000 and 2004, as shown in Table 2.

Table 2. Number of publications by Period

Period of Publication	Nº of Publications	
	n	%
1990 a 1994	06	13,33
1995 a 1999	11	24,44
2000 a 2004	19	42,22
2005 a 2010	09	20,00
Total	45	100

By checking the type of each publication, we identified that 84.4% of all selected papers are originated from medical journals, as shown in Table 3, and, with regard to the type

of published paper: 53.3% are review papers, 40 % are original papers and 6.7% are book chapters.

Table 3. Number of publications by Type of Publication

Type of Publication	Nº of Publications	
	n	%
Medical	38	84,4
Nursing	02	4,4
Book chapter	04	8,9
Institutional Publication	01	2,2
Total	45	100

Regarding the local of publication, it should be highlighted the United States of America, with 53.33% of the published papers,

followed by Brazil, United Kingdom, Italy and Deutschland, as described in Table 4.

Table 4. Number of publications by Local of Publication

Local of Publication	Nº of Publications	
	n	%
United States of America	24	53,33
Brazil	10	22,22
United Kingdom	08	17,78
Deutschland	02	4,44
Italy	01	2,22
Total	45	100

All attention of this study was turned to the low number of Brazilian publications, which emphasizes the proposal of the study objective, by proving that there are not enough publications for enhancing the knowledge of this theme in the face of this new policy to meet the men's health needs.

The methodological quantitative approach is present in 100% of the original papers, proving that such types of studies are of utmost importance for the knowledge of male hypogonadism or andropause.

It is noticed that, in Brazil, the delay as for this type of study refers the former non-existence of a health strategy aimed at the male audience, which does not happen in other countries that have already mastered this knowledge since the 1990s, in an era where publications about the main issue

studied in this research took larger proportions and promoted more satisfactory measures for prevention and treatment.

• Testosterone production in the body

Testicles are the male gonads. Each testicle is composed of a tangle of tubes, the seminiferous ducts. These ducts are formed by the Sertoli cells (or support cells) and by the germinating epithelium, where there will be the formation of spermatozoa. Amid the seminiferous ducts, the interstitial cells or Leydig cells (old nomenclature) produce male sexual hormones, particularly the testosterone, which is responsible for the development of the male genital organs. Testosterone is a hormone responsible for secondary sexual characteristics that appear at puberty. It has a powerful stimulating effect on libido, sexual desire and arousal.¹¹

Testosterone production is stimulated by hormones produced by a gland at the base of the brain called pituitary gland, which in turn releases the luteinizing hormones (LH) and the follicle stimulating hormone (FSH); in testicles, the LH acts on the Leydig cells, by stimulating the testosterone production, which is the main male hormone. In adolescence, testosterone is responsible for the sexual characteristics related to the masculine maturity, such as: the development of the penis, increased amount of hair, the changing in the voice and increased muscle mass. In young adult males, the hypothalamic-pituitary-gonadal axis regulates the circulating concentration of testosterone, and the hypothalamic pulse generator segregates a pulse of gonadotropin-releasing hormone (GnRH), approximately, every 90 minutes.¹²⁻³

Testosterone also is an anabolic hormone that increases the metabolic processes in muscles, bones, bone marrow (erythropoiesis), immune system and brain (cognition and humor).¹⁴

• The decline of testosterone in the senescence process

The senescence refers to the physiological changes of aging. The biological aging is a process that begins at birth and continues until death. The term “senescence” describes a period of changes, related to the passage of time, that cause deleterious effects in the body, represents a complex phenotype of biology that is manifested in all tissues and organs. This process affects the physiology of the body and has an impact on the functional capacity of the individual, by making it more susceptible to chronic diseases.¹⁵ The decline of testosterone in this process is related to the decrease of hypothalamic and testicular functions. At a certain age, there is a consequent reduction of the gonadotropin-releasing hormone, resulting in decreased production of luteinizing hormone (LH) by the pituitary gland. The number of Leydig cells also decreases with aging, resulting in reduction of testosterone production.⁷

From the age of 40 years, it takes place every year a decrease of 1.2% of the circulating levels of free testosterone (FT) and 1.0% of testosterone associated with albumin and, also, an increase of about 1.2 % of levels of the sex hormone binding globulin (SHBG), the carrier protein that is linked to about 50% of the circulating testosterone.¹⁶

The total testosterone (TT) remains stable until the age group from 50 to 55 years and, thereafter, also begins to decline itself at a rate between 0.4% (10) and 0.85% per year.

This is a factor that causes a greater number of cases in older men, thus adding more therapeutic resistance and no user interaction to the treatment and to health professionals.¹⁷

This reduction is about 35% between 25 and 75 years and, as a result, their mean values at 75 years old are about 65% of those found in young men, which confirms the above quote that the older men are more susceptible to the symptoms of male hypogonadism.¹⁸

In the senescence occurs a series of changes in circulating levels of hormones, neurotransmitters, neuropeptides, vitamins and other substances, being that some of these biochemical changes have major role in the genesis of decline of the androgenic function of the elderly man. The concentration of circulating cortisol, in turn, remains steady or even slightly higher, and the one concerning the C-19 adrenal steroids undergoes a marked reduction (adrenopause) soon after the 40 years old, being that this is the first hormonal changing found in the aging process.¹⁹

• Adverse factors that affect the testosterone levels

Besides the aging process itself, there are physiological factors and others related to lifestyle (feeding, physical activity, sexuality, etc.) that influence the variability of these levels and that should be considered in the elderly man assessment.²⁰

Regarding the factors related to the lifestyle, a vegetarian diet and rich in fiber seems to be more associated with higher levels of sex hormone binding globulin (SHBG) and testosterone than a meat-based diet with high lipid contents, which could be due to the fact that a lesser insulinemia following the vegetarian diets. Another cause of temporary androgenic reduction is the prolonged fasting, in which there is a decrease in leptin levels and, as a result, a gonadotropin deficiency.²¹ Another contributing factor to the male hypoandrogenism is the decreased production of melatonin, which is a typical feature of old men and that would be one of the origins of this somatotrophic deficiency.⁵

• Hypogonadism in the senescence and its clinical importance

The clinical picture of man with hypogonadism is very similar to the one of young man, which suggests that a good part of these clinical changes is due to the hypoandrogenism. Nevertheless, this probable correlation has not been thoroughly explored hitherto, and the signs found until now are weak, getting the idea that the clinical

picture of some men and the androgenic decrease that was observed in them are coincident consequences, but independent of each other, from the senescence.²²

There is the occurrence of testicular dysfunction in the presence of systemic diseases, and it was demonstrated that unhealthy men had serum levels of testosterone lower than the age-matched healthy men.²³⁻⁴

Most part of the signs and symptoms found in men with hypogonadism would be the effect of intercurrent diseases, usually more incidents in this age group and, also, from the senescence process. Nowadays, it is considered that the male hypoandrogenism can, at best, be responsible for a portion of the clinical picture observed in them.²² This correlation between intercurrent diseases and hypotestosteronemia is further confirmed by a lower frequency of positive responses to the hormone replacement (HR) in groups of elderly men compared to those of younger subjects.²⁴

• Male hypogonadism and sexual activity

We found that 80% of men who have more than 60 years remain sexually active, and it is likely that the percentage of clinically affected men are slightly above 20%. In men under the age of 50 years, testosterone levels around 60% of the reference values are sufficient to keep the sexual function. However, in healthy men from 45 to 75 years old was also shown a positive correlation between levels of Biomolecular Testosterone (BT) and increased sexual activity. Due to its importance and a higher incidence, non-hormonal factors, such as low prior sexual activity, loss of attractive of the (same) partner, monotony in sexual life, stress and depressed mood by social and environmental problems, misuse of illegal drugs, alcohol and medicinal drugs and others must be taken into account when assessing the impaired sexuality of the elderly men.²⁰

For this reason, many men albeit with slightly reduced levels of testosterone, but healthy and without facilitator non-hormonal factors of sexual dysfunction, remain sexually active. However, it is possible that the testosterone levels required are higher than is often thought to keep normal sexuality of men, what, should it be proven, will result in a greater number of men being considered hypogonadic subjects.¹⁸

The reduction of serum levels of testosterone may not affect the sexual functions of men, although appropriate levels of testosterone are necessary to keep libido,

nocturnal erections and those ones induced by erotic thoughts and also co-determining the erectile capacity, since the testosterone stimulates the production and release of nitric oxide in the corpora cavernosa. Thus, it seems that these levels are reduced instead of being raised.²⁷

• Diagnostic forms of male hypogonadism

The diagnosis of late male hypogonadism should be based on clinical symptomatology and biochemical parameters, bioavailable or free testosterone.³ It is a challenge to establish a diagnosis of male hypogonadism; its symptoms are not specific and most of them may be related to the advanced age stage or other hormonal conditions.²⁸

According to the clinical diagnosis, the main symptoms of male hypogonadism are: decreased libido; erectile dysfunction, depression, decreased muscle tissue, increased fibrous muscle tissue; decreased muscle strength, increased total adipose tissue; fat redistribution; osteopenia; osteoporosis and decreased testicular volume.²⁹

The therapeutic criteria are both clinical and laboratory-related. These are signs of hypogonadism: decreased muscle mass and physical strength, increased abdominal fat, signs of osteoporosis, decreased libido and consequent erectile difficulties.²²

Memory loss, difficulty in concentrating, insomnia, irritability and depressed mood are non-specific signs and could be related to the process of senescence. As for hot flashes and increased thermal sensitivity, they are characteristics of a severe hypogonadic patient, which do not occur in an elderly person with hypogonadism, except for the rare exceptions.²⁰

The dosage of testosterone in saliva may be useful for studying hormonal profiles of large numbers of individuals, with valid correlations with dosages of testosterone in the blood.³⁰ To confirm the diagnosis of hypogonadism, it should be conducted at least two dosages of testosterone, since it is possible to occur weekly variations in dosage, mainly, in older men, whose testosterone levels fluctuate between the below the normal limit and slightly below the normal limit.³¹

With the demonstration of a morning serum level of testosterone below the minimum benchmark value of young adults, together with the clinical aspects of hypogonadism, it is possible to give the diagnosis of male hypogonadism.^{20,31}

• Conventional treatment measures, their benefits and risks

There is always an indication of hormone replacement when there is the presence of suggestive symptoms of androgenic deficiency followed by serum levels of total testosterone below 300 ng/dL (nanogram per deciliter) and levels of free testosterone below 6,5 ng/dL.⁸ The treatment is related to the relief of the symptoms of hormonal deficiency to restore the physical and mental welfare, in order to achieve the appropriate serum levels of testosterone.²⁶

The objective of hormone replacement is the relief of the symptoms related to the androgenic deficiency, reaching serum levels of testosterone that resemble themselves to the suitable levels of young adults.²² The risks of hormone replacement will depend on the used product, its dosage and, finally, the route of administration.³²

There are several ways of application for the hormone replacement therapy, in which oral androgens, transdermal androgens, subcutaneous androgens and injectable androgens are encompassed, being that the oral androgens are unsuitable due to the large potential of hepatotoxicity presented by this type of medication.⁸

It should also be emphasized the transdermal androgens as the route of administration that offers a more physiological replacement, and these products are available in scrotal and non-scrotal adhesives and gels.³³

Because of their easy use, scrotal and non-scrotal adhesives do not allow physiological levels of testosterone, allowing immediate suspension of the treatment when needed.³⁴ Being that one of the contraindications for their use is related to the local irritation of the skin, which promotes an abandonment rate between 10% and 15% and they still require a large area of skin where the hair removal must be performed.^{10,34}

The use of gel is well tolerated and it can be continuously applied at the same location without any dermatological reaction.³⁵ Thus, it is cited as a most effective transdermal method than adhesives because of its association with non-irritability and high effectiveness.³⁴

Currently, there is a great use of subcutaneous implants, because they provide steady and physiological levels of testosterone, but their use is not recommended for elderly people, since the extrusion and the local infection occur in approximately 10% of cases.³⁶ The most frequent and most used is the injectable one, because it is the cheapest method of hormone

replacement therapy, being common that it is inserted by the intramuscular route.⁸

As main benefits of hormone replacement therapy, it should be cited: restoration of bone mass, muscle strength and body composition, restoration of libido and sexual function and increased muscle strength in the lower limbs, increasing the lean mass and reducing the fat mass in young or old hypogonadic men.^{10,34}

With the use of hormone replacement therapy, the progressive increase in libido and sexual arousal occurs, being that the sexual dysfunction is one of great problems that significantly affect the life quality of men with hypogonadism.³⁷

The hormone replacement therapy still has a strong influence on the metabolism of lipids and carbohydrates, and its effects has been demonstrated on hypogonadic individuals through decreased levels of HDL (high density lipoproteins) and lack of change in the levels of LDL (low density lipoprotein) and triglycerides.³⁸

Nonetheless, it should be highlighted that hormone replacement in men with low levels of free or total testosterone brings highly beneficial effects on humor, sexual libido, muscle mass, bone mass and especially to the life quality, even so, it is important to emphasize that such effects are most evident in individuals with low levels of testosterone.⁸

The main and most worrisome effect of hormone replacement therapy in men is increased number of undiagnosed prostate disease. The replacement treatment induces a slight increase in the prostate volume in hypogonadic men, but the size of the organ in question is still comparable to the normal population average.³⁹

The effects of androgens on the cardiovascular system are controversial. Serum levels of testosterone in rates below the standard limit in normal men slightly increase the risk of cardiovascular disease.⁴⁰

Hepatotoxicity is a rare event and it is limited almost exclusively to the use of oral preparations, which are highly hepatotoxic and can cause the development of hepatocellular adenomas, hepatic carcinomas, cholestasis, and hemorrhagic cysts in the liver.¹⁰

Replacement with testosterone has been associated with worsening or onset of sleep apnea in men treated with high doses of testosterone.⁴¹

Other side effects such as gynecomastia, which is a benign, infrequent and generally reversible complication, infertility and

decreased testicular volume, are related to the supraphysiological doses of testosterone.^{34,10} The retention of sodium and water can occur during the replacement and, usually, has clinical significance for patients with cardiac decompensation, hypertension or renal failure.³⁴ The skin reactions such as erythema and itching are common with the use of adhesives. Intramuscular injections can cause local pain, lumps, rashes and boils. Acne, skin greasiness, increased body hair and cutaneous flushing are benign and reversible complications that do not bring greater concerns.¹⁰

• Nursing Work

The referral of the nursing consultation, with the sole purpose to promote sexual health, should unfold itself in broad objectives, which consider at least four essential aspects: historical sexual rights; processes to generate vulnerabilities and potential for coping; specific socio-epidemiological profiles; needs and demands of individuals who are target groups for care.⁴²

The nursing consultation for the sexual health should constitute itself in a placeholder of care also directed to men. Every subject should know that he has an own and reserved space in which his privacy will be respected, whenever it is interesting. However, the joint participation of companions and/or their family members during the attendance must be guaranteed, by treating each participant as the main target of the care. It is desirable that those involved know, accept, and participate actively in the proposals of attendance from the nursing service.^{42,8}

Men have difficulty to recognize their needs, cultivating the magical thinking that rejects the possibility of becoming ill. A very pointed question by men for not seeking the services of primary care is associated with their social position of providers. They argue that the work shift of healthcare services coincides with their working hours. The mobilization of the Brazilian male population to the struggle for guaranteeing their social right to health is one of the challenges of this policy, which pursues to politicize and sensitize men to the recognition and statement of their social and health conditions, so that individuals protagonists of their demands can appear, consolidating their exercise and enjoyment of the citizenship rights.⁴³

It is recognized, hence, that the mode of socialization imposed on men over the years

has hindered the process of change regarding their perception about the care for the health. By being prepared strategies addressed to the awareness of the male population about the adoption of healthier habits, it is essential to raise the awareness of the healthcare professionals, especially those working in primary care, to understand patterns culturally ingrained in the population about what is to be a male.⁴⁴

Another equally noted point is the difficulty of access to the healthcare services, by claiming that, for medical appointments, it is necessary to face endless queues that, often, cause the “loss” of a full working day, without necessarily having their claims resolved in a single consultation.⁴⁵

Manners that allow an improvement in overall life quality of the male population are based on obtaining the best parameters of access to health information, guidance from trained professionals, proper nutrition and according to their needs and regular physical activity. The sum of the care provided by the nursing staff linked to the suitability for a healthier life leads to an increased male reproductive health, which adds indispensable factors for achieving a significant improvement in the lifestyle of each individual.⁴³

FINAL REMARKS

We conclude that, based on the scientific papers and the surveyed literature, in Brazil there are not many studies about male hypogonadism, which weakens our vision mode for an increasingly common harm among men. The best way to make this issue visible to those who do not have knowledge of its existence is to reflect and research the issue so that the inclusion of this knowledge among professionals and men can be noted and, for this reason, an improvement can happen in the quality of knowledge regarding this theme and also in the life of the male population. This study also addressed the impacts on the men's health caused by male hypogonadism, from diagnostic forms to conventional treatments.

For the nursing professional, obtaining such knowledge enhances the type of care that will be provided to the male population, since the participation of this class of healthcare workers, in many cases, differentiates the type of conduct that will be taken, subsequently, taking into account all the scientific basis that can make a difference in the life of a human being even before the attempt to conduct a drug treatment.

We conclude this current study by highlighting that knowledge about this issue goes unnoticed among men of different social classes and many would be the chances of resolving harms that are related to male hypogonadism if this population had all the guidelines and clarifications about how they could avoid its evils. However, it becomes increasingly important to know the target population of our work so that insertion strategies of knowledge can promote a considerable improvement in the context of absenteeism of men who fail to seek healthcare services because of their prejudices, taboo and, even, social issues. All are susceptible to the maleficence of life and it is a task of the healthcare professionals to seek ways of promoting knowledge and, thereby, alleviate these evils.

REFERENCES

1. Psiqweb - Psiquiatria na Web [Internet]. Andropausa [updated 2008 Dec; cited 2011 Aug 20]. c2008-2012:[about 1 screen]. Available from: <http://www.psiqweb.med.br/site/?area=NO/LerNoticia&idNoticia=111>
2. Burns-Cox N, Gingell C. The andropause: fact or fiction? Postgrad Med J [Internet]. 1997 Sep [cited 2011 Mar 03];73(863):553-6. Available from: <http://pmj.bmj.com/content/73/863/553.full.pdf>
3. Martits AM, Costa EMF. Hipogonadismo Masculino Tardio ou Andropausa. AMB Rev Assoc Med Bras [Internet]. 2004 Oct-Dec [cited 2011 Mar 03];50(4):358-9. Epub 2005 Jan 14. Available from: <http://www.scielo.br/pdf/ramb/v50n4/22740.pdf>
4. Marks LS, Mazer NA, Mostaghel E, Hess DL, Dorey FJ, Epstein JI, et al. Effect of testosterone replacement therapy on prostate tissue of men with late onset hypogonadism: a randomized controlled trial. JAMA [Internet]. 2006 Nov [cited 2011 Mar 04];296(19):2351-61. Available from: <http://jama.jamanetwork.com/article.aspx?articleid=204163>
5. Morales A, Heaton JP, Carson CC 3rd. Andropause: a misnomer for a true clinical entity. J Urol [Internet]. 2000 Mar [cited 2011 Mar 05];163(3):705-12. Available from: [http://www.jurology.com/article/S0022-5347\(05\)67788-9/fulltext](http://www.jurology.com/article/S0022-5347(05)67788-9/fulltext)
6. Morales A, Buvat J, Gooren LJ, Guay AT, Kaufman JM, Tan HM, et al. Endocrine aspects of sexual dysfunction in men. J Sex Med [Internet]. 2004 Jul [cited 2011 Mar 05];1(1):69-81. Available from: http://www.hawaii.edu/hivandaids/Endocrine_Aspects_of_Sexual_Dysfunction_in_Men.pdf
7. Matsumoto AM. Andropause: clinical implications of the decline in serum testosterone levels with aging in men. J Gerontol A Biol Sci Med Sci [Internet]. 2002 Feb [cited 2011 Mar 05];57(2):76-99. Available from: <http://webmedia.unmc.edu/alliedhealth/nichols/Andropause%20and%20Men.pdf>
8. Martits AM, Costa EMF. Tratamento e Monitoramento da Andropausa. AMB Rev Assoc Med Bras [Internet]. 2005 May-June [cited 2011 Mar 03];51(3):127-9. Available from: <http://www.scielo.br/pdf/ramb/v51n3/a07v51n3.pdf>
9. Juul A, Skakkeback N. Androgens and the aging male. Hum Reprod Update [Internet]. 2002 Sep-Oct [cited 2011 Mar 05];8(5):423-33. Available from: <http://humupd.oxfordjournals.org/content/8/5/423.full.pdf>
10. Martits AM, Costa EMF. Benefícios e Riscos do Tratamento da Andropausa. AMB Rev Assoc Med Bras [Internet]. 2005 Mar-Apr [cited 2011 Mar 03];51(2):67-70. Available from: <http://www.scielo.br/pdf/ramb/v51n2/24393.pdf>
11. Bagatell CJ, Heiman JR, Rivier JE, Bremner WJ. Effects of endogenous testosterone and estradiol on sexual behaviour in normal young men. J Clin Endocrinol Metab [Internet]. 1994 Mar [cited 2011 Mar 05];78(3):711-6. Available from: <http://jcem.endojournals.org/content/78/3/711.full.pdf>
12. Reyes-Fuentes A, Veldhuis JD. Neuroendocrine physiology of the normal male gonadal axis. Endocrinol Metab Clin North Am. 1993 Mar; 22(1):93-124.
13. Nishida SM. Bases da fisiologia animal: Ciclo de Vida dos Animais. 1st ed. São Paulo: Teia do Saber; 2006.
14. Bagatell CJ, Bremner WJ. Androgens in men--uses and abuses. N Engl J Med [Internet]. 1996 Mar [cited 2011 Mar 05];334(11):707-14. Available from: <https://www.researchgate.net/search.Search.html?query=Androgens+in+Men+%E2%80%94+Uses+and+Abuses>
15. Balcombe N, Sinclair A. Ageing: definitions, mechanisms and the magnitude of the problem. Best Pract Res Clin Gastroenterol [Internet]. 2001 [cited 2011 Mar 05];15:835-84. Available from: [http://www.bpgastro.com/article/S1521-6918\(01\)90244-6/pdf](http://www.bpgastro.com/article/S1521-6918(01)90244-6/pdf)

16. Gooren LJ. The age-related decline of androgen levels in men: clinically significant? *Br J Urol* [Internet]. 1996 Nov [cited 2011 Apr 01]; 78(5):763-8. Available from: <http://onlinelibrary.wiley.com/doi/10.1046/j.1464-410X.1996.05918.x/pdf>
17. Vermeulen A, Kaufman JM, Giagulli VA. Influence of some biological indices on sex hormone binding globulin and androgen levels in aging and obese males. *J Clin Endocrinol Metab* [Internet]. 1996 May [cited 2011 Apr 01];81(5):1821-6. Available from: <http://jcem.endojournals.org/content/81/5/1821.full.pdf>
18. Vermeulen A. Andropause. *Maturitas* [Internet]. 2000 Jan [cited 2011 Apr 01];34(1):5-15. Available from: [http://www.maturitas.org/article/S0378-5122\(99\)00075-4/pdf](http://www.maturitas.org/article/S0378-5122(99)00075-4/pdf)
19. Belanger A, Candas B, Dupont A, Cusan L, Diamond P, Gomez JL, et al. Changes in serum concentrations of conjugated and unconjugated steroids in 40-to 80-yearold men. *J Clin Endocrinol Metab* [Internet]. 1994 Oct [cited 2011 Mar 05];79(4):1086-90. Available from: <http://jcem.endojournals.org/content/79/4/1086.full.pdf>
20. Bonaccorsi AC. Andropausa: Insuficiência Androgênica Parcial do Homem Idoso: Uma Revisão. *Arq Bras Endocrinol Metabol* [Internet]. 2001 Apr [cited 2011 Mar 05];45(2):123-33. Available from: <http://www.scielo.br/pdf/abem/v45n2/a03v45n2.pdf>
21. Cunningham MJ, Clifton DK, Steiner RA. Leptin's actions on the reproductive axis: perspectives and mechanisms. *Biol Reprod* [Internet]. 1999 Feb [cited 2011 Mar 05];60(2):216-22. Available from: <http://www.biolreprod.org/content/60/2/216.full.pdf>
22. Kaufman JC, Vermeulen A. Androgens in male senescence. In: Nieschlag E, Behre HM, editors. *Testosterone. Action, Deficiency, Substitution*. Berlin: Springer; 1998. p. 497-541.
23. Gray A, Feldman HA, McKinlay JB, Longcope C. Age, disease, and changing sex hormone levels in middle-aged men: results of the Massachusetts Male Aging Study. *J Clin Endocrinol Metab* [Internet]. 1991 Nov [cited 2011 Apr 10];73(5):1016-25. Available from: <http://jcem.endojournals.org/content/73/5/1016.full.pdf>
24. Handelsman DJ. Testicular dysfunction in systemic disease. In: Ahlen HV, Behre HM, Nieschlag E, editors. *Andrology - Male Reproductive Health and Dysfunction*. Berlin: Springer; 2001. p. 242-52.
25. Guay AT, Bansal S, Heatley GJ. Effect of raising endogenous testosterone levels in impotent men with secondary hypogonadism: double blind placebo-controlled trial with clomiphene citrate. *J Clin Endocrinol Metab* [Internet]. 1995 Dec [cited 2011 Apr 20];80(12):3546-52. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/8530597>
26. Vermeulen A. Androgen replacement therapy in the aging male -- a critical evaluation. *J Clin Endocrinol Metab* [Internet]. 2001 June [cited 2011 Apr 20];86(6):2380-90. Available from: <http://jcem.endojournals.org/content/86/6/2380.full>
27. Lugg JA, Rajfer J, González-Cadavid NF. Dihydrotestosterone is the active androgen in the maintenance of nitric oxide mediated penile erection in the rat. *Endocrinology* [Internet]. 1995 Apr [cited 2011 Apr 20];136(4):1495-501. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/7534702>
28. Clapauch R, Carmo AM, Marinheiro L, Buksman S, Pessoa I. Laboratory Diagnosis of Late-Onset Male Hypogonadism Andropause. *Arq Bras Endocrinol Metabol* [Internet]. 2008 Dec [cited 2011 Apr 20];52(9):1430-8. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0004-27302008000900005
29. Vermeulen A, Goemaere S, Kaufman JM. Testosterone, body composition and aging. *J Endocrinol Invest* [Internet]. 1999 [cited 2011 Apr 20];22(5 Suppl):110-6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/10442580>
30. Krause W, Mueller U, Mazur A. Measurement of steroid levels in saliva in a population-based survey of lifestyle, medical conditions, marriage, sex life and hormone status in aging men: a feasibility study. *Aging Male* [Internet]. 2002 Dec [cited 2011 Apr 20];5(4):203-15. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/12630067>
31. Wang C, Catlin DH, Demers LM, Starcevic B, Swerdloff RS. Measurement of total serum testosterone in adult men: comparison of current laboratory methods versus liquid chromatographytandem mass spectrometry. *J Clin Endocrinol Metab* [Internet]. 2004 Feb [cited 2011 Apr 20]; 89(2):534-43. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/14764758>

32. Nieschlag E, Behre HM. Pharmacology and clinical uses of testosterone. In: Nieschlag E, Behre HM, editors. *Testosterone. Action, Deficiency, Substitution*. Berlin: Springer; 1998. p. 293-328.
33. Dobs AS, Meikle AW, Arver S, Sanders SW, Caramelli KE, Mazer NA. Pharmacokinetics, efficacy, and safety of a permeation-enhanced testosterone transdermal system in comparison with biweekly injections of testosterone enanthate for the treatment of hypogonadal men. *J Clin Endocrinol Metab* [Internet]. 1999 Oct [cited 2011 Apr 20];84(10):3469-78. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/10522982>
34. Wang C, Swerdloff RS, Iranmanesh A, Dobs A, Snyder PJ, Cunningham G, et al. Transdermal testosterone gel improves sexual function, mood, muscle strength, and body composition parameters in hypogonadal men. Testosterone Gel Study Group. *J Clin Endocrinol Metab* [Internet]. 2000 Aug [cited 2011 Apr 20];85(8):2839-53. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/10946892>
35. Falahati-Nini A, Riggs BL, Atkinson EJ, O'Fallon WM, Eastell R, Khosla S. Relative contributions of testosterone and estrogen in regulating bone resorption and formation in normal elderly men. *J Clin Invest* [Internet]. 2000 Dec [cited 2011 Apr 20];106(12):1553-60. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC381474/>
36. Kelleher S, Conway AJ, Handelsman DJ. A randomised controlled clinical trial of antibiotic impregnation of testosterone pellet implants to reduce extrusion rate. *Eur J Endocrinol* [Internet]. 2002 Apr [cited 2011 June 01];146(4):513-8. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/11916619>
37. McNicholas TA, Dean JD, Mulder H, Carnegie C, Jones NA. A novel testosterone gel formulation normalizes androgen levels in hypogonadal men, with improvements in body composition and sexual function. *BJU Int* [Internet]. 2003 Jan [cited 2011 Jun 01];91(1):69-74. Available from: <http://www.healthmegamall.com/Articles/BabeskinArticle336.pdf>
38. Shaneyfelt T, Husein R, Bubley G, Mantzoros CS. Hormonal predictors of prostate cancer: a meta-analysis. *J Clin Oncol* [Internet]. 2000 Feb [cited 2011 June 1];18(4):847-53. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/10673527>
39. Behre HM, Bohmeyer J, Nieschlag E. Prostate volume in testosterone-treated and untreated hypogonadal men in comparison to age-matched normal controls. *Clin Endocrinol* [Internet]. 1994 Mar [cited 2011 June 01];40(3):341-9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/7514512>
40. Hak AE, Witteman JC, de Jong FH, Geerlings MI, Hofman A, Pols HA. Low levels of endogenous androgens increase the risk of atherosclerosis in elderly men: the Rotterdam study. *J Clin Endocrinol Metab* [Internet]. 2002 Aug [cited 2011 June 01];87(8):3632-9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/12161487>
41. Liu PY, Yee B, Wishart SM, Jimenez M, Jung DG, Grunstein RR, et al. The short-term effects of high-dose testosterone on sleep, breathing, and function in older men. *J Clin Endocrinol Metab* [Internet]. 2003 Aug [cited 2011 June 01];88(8):3605-13. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/12915643>
42. Mandu ENT. Consulta de enfermagem na promoção da saúde sexual. *Rev Bras Enferm* [Internet]. 2004 [cited 2011 June 01];57(6):729-32. Available from: <http://www.scielo.br/pdf/reben/v57n6/a20.pdf>
43. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. Política Nacional de Atenção Integral à Saúde do Homem: Princípios e diretrizes; 2008. 46 p.
44. Brito RS, Santos DLA. Homens e ações preventivas em saúde: Revisão sistemática de literatura. *J Nurs UFPE online* [Internet]. 2010 Apr/June [cited 2011 Oct 10];4(3):[about 6 p]. Available from: http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/1054/pdf_111.
45. Schraiber LB, Gomes R, Couto MT. Homens e saúde na pauta da saúde coletiva. *Cien Saude Colet* [Internet]. 2005 [cited 2011 Jun 01];1:7-17. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-81232005000100002

Melo MC de, Soares AN, Baragatti DY.

Male hypogonadism or andropause...

Submission: 2011/11/15
Accepted: 2012/12/25
Publishing: 2013/03/15

Corresponding Address

Márcio Cristiano de Melo
Rua Tenente Geraldo de Souza Clóvis, 362
Ap. 203 / Bairro Angola
CEP: 32604-090 – Betim (MG), Brazil