Non-Medical Methenolone Use and Anti-Aging: Medical Evidence

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Abstract

Methenolone, an anabolic steroid traditionally prescribed for specific medical conditions, has gained traction for non-medical uses, especially in terms of anti-aging. Even though methenolone is generally associated with its anabolic effects, its growing use for rejuvenation purposes, including improved vitality and muscle preservation, has become a major subject of interest. The use of anabolic steroids is linked to enhancing physical appearance and counteracting age-related decline, despite the limited research on long-term effectiveness and safety profile.

The primary objective of this white paper is to investigate the clinical evidence and emerging trends surrounding non-medical methenolone use, particularly in an anti-aging context. The white paper evaluates available evidence, potential benefits and side effects, and ethical concerns. Through an overview of the available research, this whitepaper underscores the significance of understanding the broader implications of methenolone use and sheds more light on the need for further research and comprehensive studies to evaluate its effectiveness and safety profile.

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Introduction

Methenolone, commonly known by its brand name Primobolan, is an androgen and anabolic steroid (AAS) with primary applications in treating and preventing muscle wasting due to drug treatments, diseases, and other catabolic processes. Classified as a 3-hydroxylated C19 steroid hormone, methenolone belongs to the group of androgens and derivatives, which are associated with the development of masculine characteristics.

Methenolone was first introduced in 1962 in the United States under the brand name Nibal Depot. Initially prescribed for muscle loss following surgery, long-term illness, infections, and malnutrition, methenolone was also used in treating specific conditions like breast cancer and osteoporosis. In some cases, it supported weight gain in infants struggling with developmental delays or chronic underweight issues.

One notable characteristic of methenolone is its strong binding affinity to androgen receptors, which is reportedly higher than that of testosterone, suggesting a potent anabolic effect that supports muscle maintenance and growth.

Beyond its medical use, methenolone has garnered popularity among bodybuilders and athletes who seek enhanced muscle definition and strength without the high water retention often associated with other anabolic steroids. Recently, there has also been increased interest in methenolone's potential applications in anti-aging therapies. Its low aromatization rate makes it a preferable option for those looking to support lean muscle preservation with reduced risk of estrogenic side effects.

This paper will further explore methenolone's mechanisms of action, its applications in medical and non-medical contexts, and its potential utility within anti-aging treatments.

Problem Statement

Methenolone, an anabolic steroid primarily prescribed for treating muscle-wasting conditions, has recently gained attention for its potential applications in anti-aging therapies. As individuals age, the natural decline in anabolic hormones can lead to significant consequences, such as reduced muscle mass, loss of strength, and general physical deterioration. In men, testosterone deficiency is particularly impactful, often manifesting in reduced libido, erectile dysfunction, cognitive decline, depression, fatigue, osteoporosis, and a marked decrease in muscle mass and strength.

The non-medical use of methenolone as an anti-aging agent has thus become a controversial yet growing trend, with users aiming to mitigate age-related declines in physical vitality. Despite the increasing popularity of methenolone for such purposes, there remains a significant gap in understanding its long-term safety and effectiveness within the context of anti-aging. The intricate interactions between anabolic agents and the aging process warrant deeper investigation to assess the potential benefits and risks associated with this practice.

Further research is essential to evaluate methenolone's effects on the aging body, particularly given that age-related hormonal decline involves complex physiological changes. This white paper explores the current evidence on methenolone’s role in anti-aging and discusses the need for clinical studies that could shed light on its safety, efficacy, and potential role in promoting longevity and vitality in an aging population.

Literature Review

This white paper examines the non-medical use of methenolone, with a particular focus on its potential anti-aging applications. Due to limited research specifically targeting methenolone’s effects in an anti-aging context, this paper relies on studies of anabolic androgenic steroids (AAS) to provide a broader understanding, as methenolone belongs to this class of drugs. Research by Z. Wenbo, Z. Yan, J.G. Yu, and D. McCullough offers a comprehensive view of AAS use in enhancing muscle growth and physical performance, which indirectly sheds light on the purposes for which methenolone is often employed. These findings highlight that, while methenolone is commonly used to support similar goals, significant gaps exist in specific research on its anti-aging applications.

Studies by M. Al Hashimi, J.M. Armstrong, and P.J. Rizk further explore the reproductive impacts of AAS, suggesting that long-term use may be associated with negative consequences, including erectile dysfunction and infertility. This evidence is particularly relevant to understanding methenolone’s broader effects, as it shares similar mechanisms with other AAS compounds, underscoring the need for caution in non-medical applications.

P. Bond and M. Parssinen offer insights into the systemic consequences of AAS use, including impacts on collagen synthesis and metabolic health. Given that aging is linked to reduced collagen production and altered metabolism, the potential effects of AAS on these systems are crucial considerations in assessing methenolone’s anti-aging potential.

G. Corona and M. Ng Tang Fui contribute important information regarding the safety profile of AAS, highlighting common side effects such as hormone imbalances and reproductive issues.

Although these studies do not directly address methenolone, they provide a valuable context for understanding the potential risks associated with its non-medical use, particularly in the realm of anti-aging.

Collectively, these findings emphasize the need for more targeted research on methenolone, specifically to evaluate its long-term safety and efficacy in an anti-aging framework. While AAS research offers important context, a more precise understanding of methenolone's unique effects would enable safer and more effective use in the pursuit of enhanced vitality and longevity.

Methodology

The main objective of this white paper is to review the available evidence regarding the non-medical use of methenolone, with an emphasis on its potential influence on muscle growth and the broader context for anti-aging. Due to the absence of direct studies and pieces of research on non-medical applications of methenolone, this review analyzes papers on anabolic androgenic steroids to offer insights into the mechanisms of action and potential effects of methenolone.

The studies featured in this whitepaper evaluate the role of AAS in improving muscle mass, strength, and physical performance, and analyze the safety profile. Research addressing the physiological impact of AAS, especially on cardiovascular health, metabolic outcomes, and reproductive function is investigated to provide a comprehensive view of how methenolone, as a member of this class of drugs, may affect similar systems.

Through a review of these pieces of research, this white paper sheds more light on the implications of methenolone's non-medical use, especially on muscle preservation during the aging process, while discussing the broader risks such as cardiovascular complications and hormonal imbalances.

Results/Findings

Evidence on non-medical uses of methenolone, particularly in terms of anti-aging, is very limited. However, research on anabolic steroids provides a deeper insight into mechanisms of action and potential efficacy or safety risks of methenolone as well.

Z. Wenbo and Z. Yan discussed the uses of androgenic and anabolic steroids among athletes and their positive and negative effects alike. Their findings suggest that among Americans ages 13 to 50 years, between 2.9 million and 4.0 million people have reported using these drugs. Up to one million people using AAS have developed dependence. The use of AAS, the class of drugs to which methenolone belongs, is particularly present among gym members who practice weightlifting. Factors associated with AAS use include the use of supplementary vitamins, special diets, and social exposure to people who use these steroids for similar purposes. Wenbo and Yan report that the use of AAS induces the activation of multiple pathways that lead to an increase in the size and strength of muscles. These medications bind to and activate androgen receptors in nuclei resulting in transcription of the associated genes. These genes involve transcription factors specific to structural proteins, muscles, enzymes, and microRNAs. Anabolic androgenic steroids are synthetic derivatives of the hormone testosterone and they exert their effects mainly by binding to androgen receptors within cells thereby causing various physiological responses. Wenbo and Yan explain that the use of AAS can augment muscle

mass, fiber size, and overall strength, especially in physically demanding sports. That said, misuse without guidance remains a clinical concern.

J.G. Yu et al. found that the administration of AAS may cause sustained morphological changes in human skeletal muscle thereby enhancing physical performance. In the study, doped athletes experienced increases in lean body mass, muscle fiber area, capillary density, and myonuclei density. When it comes to muscle fiber, doped athletes had on average 15% larger muscle fiber area compared to athletes who didn't use steroids. The effects were dose-dependent. Long-term supplementation with these steroids could increase lean leg mass, muscle fiber size, and strength, Yu and the team concluded.

D. McCullough et al. suggested that the chronic use of AAS increases skeletal muscle hypertrophy and improves performance by binding to the androgenic receptors. Activation of these receptors enhances gene transcription, second messenger signaling, and satellite cell activation all of which leads to amplified accretion and synthesis of muscle protein. While these steroids can increase muscle size and strength, they also impair cardiac functioning and metabolic health. McCullough and the team found that AAS can contribute to dyslipidemia, insulin resistance, and hypertension.

E. Sonmez et al. published a case report involving a 32-year-old male bodybuilder who was admitted to the emergency department due to severe chest pain. The patient reported he had been taking methenolone acetate 200mg a week for three years. Chronic use of methenolone resulted in significantly elevated cardiac markers such as peaked T waves in all derivations.

D. Piacentino et al. evaluated the presence of AASs in athletes' biological samples and linked toxicology to psychopathological findings. Their multicenter, cross-sectional study in fitness centers in Italy included 122 professional and amateur athletes training in several sports. The findings showed that 47.5% of professional and 14.6% of amateur athletes used AASs. Piacentino and the team suggest that performance seems to be more important to professional athletes since the prevalence of AAS use is higher in this group. Interestingly, AAS users (weightlifters and bodybuilders) demonstrated severe narcissistic personality traits, including entitlement exhibitionism, and impulsiveness traits. Athletes who used steroids exhibited more hostility and paranoia when using these drugs than when not using them. These drugs were also associated with irritability.

Non-medical uses of methenolone primarily revolve around efforts to increase muscle size and strength and enhance physical performance. Decreased muscle size and strength are common during the aging process, especially with loss of testosterone. However, M. Al Hashimi et al. found that uses of AAS, a group of medications to which methenolone belongs, can further worsen some common signs of aging. Al Hashimi and the team found that AAS exhibits a deleterious effect on reproductive health and leads to infertility, erectile dysfunction, abnormal hormone levels, and reduction in testicular size.

J.M. Armstrong et al. found that the long-term influence of high-dose AAS on sexual functioning remains poorly understood. High doses of testosterone appear to exhibit protective effects on erectile function during use, *de novo* symptoms such as erectile dysfunction and low libido occur more frequently after discontinuing testosterone.

P.J. Rizk et al. suggested that testosterone therapy can improve erectile function and libido and hypogonadal men. The study provides insight into the role of supplying the body with

testosterone, which is important because methenolone is a synthetic hormone that leads to higher levels of testosterone.

P. Bond et al. published a review that showed steroids and their metabolites can cause side effects such as hypertension, acne vulgaris, hepatotoxicity, dyslipidemia, erectile dysfunction, testosterone deficiency, gynecomastia, and cardiomyopathy.

M. Parssinen et al. reported that high doses of AAS reduce degradation and seem to elevate the synthesis of type I collagen. Additionally, high doses of these medications increase soft tissue collagen metabolism on the basis of improved type III collagen synthesis and elevated HP/LP (hydroxylysylpyridinoline/lysylpyridinoline) ratio during the administration period. However, tissue-specific turnover of collagen in soft connective tissues remains unknown.

G. Corona et al. found that non-medical uses of anabolic and androgenic steroids can lead to consequences such as gynecomastia, baldness, and acne. Due to the negative impact on the HPT axis, these drugs can cause a drop in gonadotrophin levels and a reduction in testis size and sperm production. These steroids can also impair lipid profile and blood pressure.

M. Ng Tang Fui et al. investigated whether testosterone treatment has benefits on body composition and caloric restriction. They found that subjects who received testosterone experienced greater reductions in fat mass. Although the dieting men who received placebo lost both fat and lean mass, men who received testosterone lost weight primarily due to loss of body fat.

Discussion

The research reviewed in this white paper provides insights into the physiological effects of anabolic androgenic steroids (AAS), including methenolone. However, studies specifically investigating methenolone's non-medical applications and anti-aging properties remain limited. Like other AAS compounds, methenolone works primarily by binding to androgen receptors, triggering gene expression that enhances protein synthesis and muscle hypertrophy. While this action could offer short-term benefits in increasing muscle size and strength—particularly for aging populations experiencing muscle loss—the long-term effectiveness and safety of methenolone in this context are unclear.

Aging is naturally accompanied by reductions in muscle mass and collagen production, largely due to a decline in hormones, notably testosterone. Although methenolone could theoretically counteract some of these effects by enhancing muscle fiber size and potentially supporting collagen synthesis, existing AAS research suggests these benefits are not without significant risks. For example, studies by McCullough et al. and Parssinen et al. show that prolonged AAS use can adversely impact cardiovascular and metabolic health, leading to conditions such as hypertension, dyslipidemia, and insulin resistance. These risks highlight the importance of carefully weighing the potential short-term anti-aging effects of methenolone against its broader health implications.

In terms of sexual health, methenolone, like other AAS drugs, may initially boost libido and support erectile function due to its androgenic effects. However, studies by Armstrong et al. and Al Hashimi et al. suggest that long-term, unsupervised use could result in reproductive issues such as infertility, erectile dysfunction, and testicular atrophy. This underscores the potential for unintended consequences, especially for older adults seeking to counter hormone-related

declines in sexual function, raising concerns about the sustainability of AAS use in non-medical applications.

The anti-aging use of methenolone remains speculative. While its effects on muscle preservation and collagen synthesis may seem appealing to those looking to counteract aging, the potential adverse effects call its safety into question. The broader evidence on AAS compounds suggests that, despite short-term gains in muscle mass and performance, the health risks often outweigh these benefits.

In conclusion, further research is necessary to better understand methenolone's long-term efficacy and safety in an anti-aging context, particularly regarding muscle preservation, sexual health, and collagen synthesis. Until more definitive data is available, non-medical use of methenolone for anti-aging purposes should be approached with caution, as the balance of benefits and risks is yet to be fully understood.

Conclusion

Like other anabolic androgenic steroids, methenolone can influence muscle size and strength and may even support collagen synthesis. These short-term benefits may appeal to individuals looking to counteract issues such as muscle loss or increased body weight. However, the non-medical use of methenolone for these purposes remains speculative, as research specific to methenolone's effects in this context is limited. Current evidence on AAS indicates that while these drugs can temporarily enhance muscle size, sexual function, and physical performance, the associated risks warrant cautious use and underscore the importance of medical supervision.

While AAS drugs offer some benefits, they are generally short-lived, and their risks—particularly in terms of cardiovascular, metabolic, and reproductive health—highlight the need for a careful approach. Further research is essential to better understand methenolone's non-medical applications, particularly in anti-aging contexts, as well as to establish its long-term safety profile.

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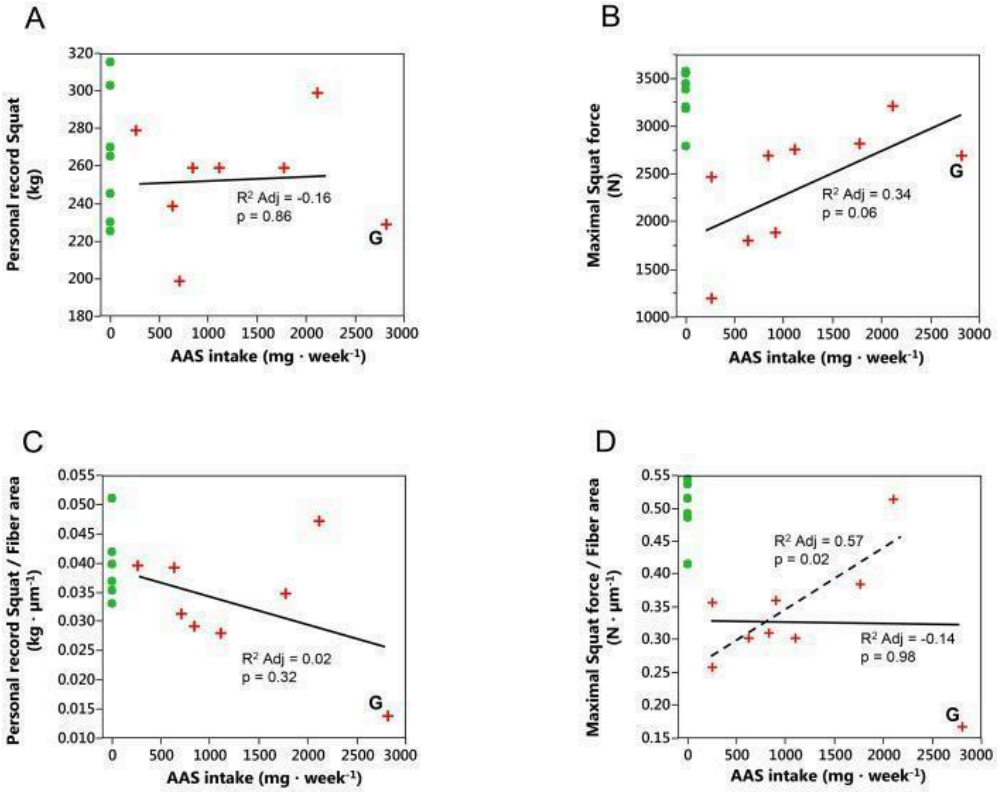
Appendices



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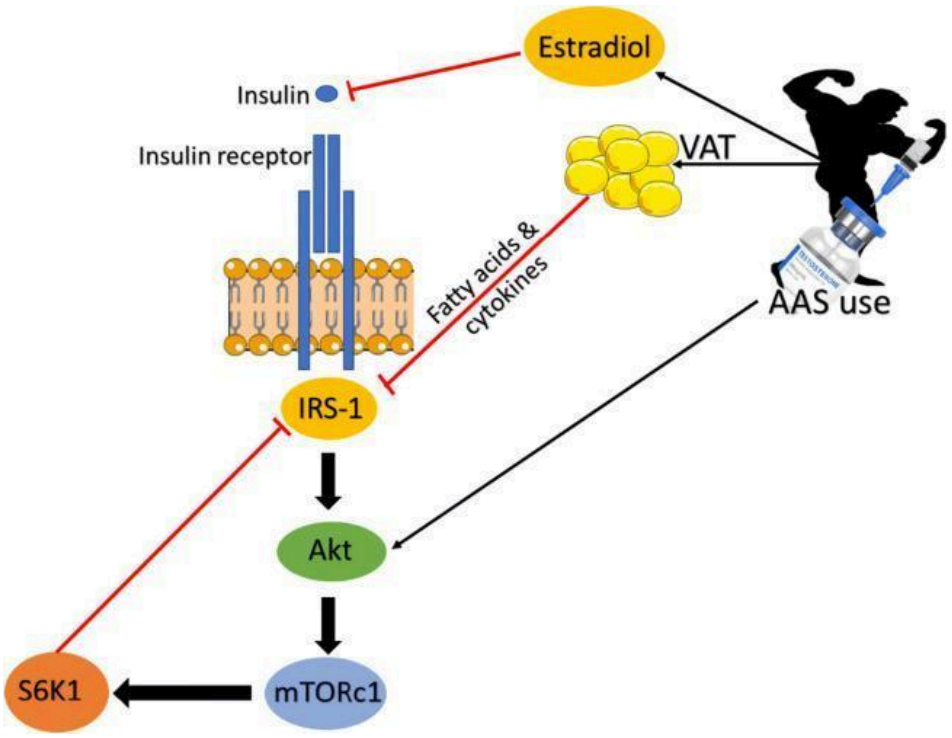

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Conflicts of Interest

The authors declared no conflict of interest.

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For any inquiries regarding this whitepaper, please contact the authors directly.