Androgen Deficiency in aging male

Essay

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رسالة

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✍ **Maged saqr**

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List of Abbreviations

AACE	American Association of Clinical Endocrinologists
ADAM	Androgen deficiency in aging male
ADT	Androgen Deprivation Therapy
AIDS	Aquired immunodeficiency syndrome
AMS	Aging male scale
AR	Androgen receptor
ASA	European Academy of Andrology
BLSA	Baltimor longitudinal study
BMD	bone mineral density
BMI	Body mass index
BPH	Benign prostatic hyperplasia
BT	Bioavailable testosterone
CAG	Cytosine-adenine-guanine
cFT	Calculated free testosterone
CHD	Coronary Heart Disease
CHF	Congestive heart failure
CNS	Central nervous system
CV	cardiovascular
CVD	Cardiovascular disease
DHEA	Dihydroepiandrosterone
DHT	Dihydrotestosterone

DM	Diabetes milletus
DM	Diabetes mellitus
DRE	Digital rectal examination
E2	Estradiol
ED	Erectile dysfunction
EMAS	European Male Ageing Study
ER	Estradiol receptor
EUA	European Association of Urology
FDA	Food and Drug Administration
FSH	Follicular stimulating hormone
FT	Free testosterone
GABA	Gama aminobutyric acid
GH	Growth hormone
GnRH	Gonadotrophine releasing hormone
HCG	human chorionic gonadotropin
HDL	High density lipoprotein
HIM	Hypogonadism in Males
HIV	Human immunodeficiency virus
HPG-axis	Hypothalamic-pituitary-gonadal axis
HSD	Hypoactive sexual desire
IIEF	International Index of Erectile Function
IPSS	International Prostate Symptom Score
ISA	International Society of Andrology
ISSAM	International Society for the Study of the Aging Male

ISSM	international society of sexual
LDL	Low density lipoprotein
LH	Leutinizing hormone
LOH	Late onset Hypogonadism
LUTS	Lower urinary tract symptoms
MENT	7α-methyl-19-nortestosterone
MetS	Metabolic syndrome
MMAS	Massachusetts male aging study
NERI	New England Research Institute
OSA	obstructive sleep apnea
PADAM	Partial androgen deficiency in aging male
PCa	prostate cancer
PCPT	Prostate Cancer Prevention Trial
PDE5-Is	phosphodiesterase type 5 inhibitors
PSA	Prostatic specific antigen
RCPT	randomized placebo-controlled trial
SARMs	Selective androgen receptor modulators
SERMs	Selective estrogen receptor modulators
SHBG	Sex hormone binding globulin
SHIP	Study of Health in Pomerania
T	Testosterone
TD	Testosterone deficiency
TD	Testosterone deficiency
TDS	Testosterone deficiency syndrome

TE	Testosterone enanthate
TP	Testosterone propionate
TRT	Testosterone replacement therapy
TT	Total testosterone
TTT	Transdermal testosterone therapy
TU	Testosterone undecanoate

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Introduction

In men, Androgen plays a key role in the development of male reproductive organs as well as puberty and promoting secondary sexual characteristics and maintaining healthy sexual life ***(Kaufman et al., 2005).***

According to the recommendations of the International Society of Andrology, the International Society for the Study of the Aging Male, and the European Association of Urology Androgen deficiency in aging male is defined as a clinical and biochemical syndrome associated with advancing age and characterized by typical symptoms and a deficiency in serum testosterone levels. It may result in significant detriment in the quality of life and adversely affect the function of multiple organ systems ***(Wang et al., 2009).***

The phenomenon of androgen deficiency due to aging has been described as androgen deficiency in aging male "ADAM", testosterone deficiency syndrome "TDS", late onset hypogonadism "LOH", and andropause. The syndrome is characterized by the presence of low testosterone levels and clinical signs and symptoms of androgen deficiency ***(Prasanth et al., 2012).***

The term andropause, commonly used today by clinicians to denote the syndrome, first appeared in the literature in the 1940's. In 1944, Heller and Myers linked depression, fatigue, loss of libido and potency, and many other signs in aging males to lower than normal levels of testosterone, and found that symptoms improved when patients were administered replacement doses ***(Heller and mayers, 1944)***.

Prevalence of ADAM increases with age starting from the fourth decade, At this point testosterone levels begin to drop gradually at a rate of roughly 0.5% to 1.5% each year. Several longitudinal and cross sectional studies have been carried out to determine the prevalence of ADAM in men, these studies have reported different prevalence rates Ranging from 6% in middle aged males and reaching up to 25% in older age groups ***(Prasanth et al., 2012***).

The decline in testosterone levels can be due to several factors including decline in Leydig cell function, decline in pituitary hypothalamic axis function with loss of circadian variation, increase in the levels of sex hormone binding globulin "SHBG" and changes in testosterone receptors sensitivity ***(Wylie et al., 2010).***

The symptoms and signs of ADAM vary depending upon the age, severity and duration of androgen deficiency,

comorbid illnesses and androgen sensitivity. Symptoms and signs include decreased libido, erectile dysfunction, muscle weakness, increased adiposity, depressed mood, and decreased vitality. Complaints about erectile dysfunction or low libido may be the primary reason to seek consultation ***(Wang et al., 2009).***

The measurement of the serum testosterone concentration is usually the most important single diagnostic test. The important factors that need to be considered in testosterone measurement are types/forms of testosterone to be measured, time of measurement, and frequency of measurement ***(Bhasin et al., 2010).***

Recommendations issued by the Endocrine Society have proposed that total testosterone measurement of less than 200ng/dl identifies subjects requiring treatment, whereas those with total testosterone in the range of 200–400ng/dl may benefit from treatment. Recent trends have led towards obtaining SHBG levels in addition to total testosterone to calculate the free testosterone index (FTI) by dividing SHBG into total testosterone. FTI of less than 0.153 supports the diagnosis ***(ASRMPC Committee 2008; Michael et al., 2010).***

Testosterone treatment aims to restore testosterone levels to the physiological range in men with consistently

low levels of serum testosterone and associated symptoms of androgen deficiency. The aim is to improve sexual function, libido, quality of life, muscle strength and bone mineral density ***(Saad et al., 2011).***

Benefits on libido, erection and ejaculation have been reported in several retrospective studies and case reports. In a recent multicenter prospective study, Moon et al. "2010" reported a significant increase in the International Index of Erectile Function (IIEF) score for sexual desire, intercourse satisfaction and overall satisfaction starting 6 weeks after the beginning of treatment. Testosterone replacement therapy has also shown encouraging results in several case reports in which satisfactory sexual intercourse was reported after at least 3 months from therapy induction in men with erectile dysfunction ***(Jungwirth et al., 2012; Moon et al., 2010).***

Major concerns of testosterone therapy in aging males are the exacerbating cardiovascular disease and the possibility of accelerating malignant prostatic disease and male breast cancer. Haematological, cardiovascular, breast and prostatic assessment should be performed before the start of treatment. Hematocrit and hemoglobin monitoring, PSA and digital rectal examination of prostate and breast examination are recommended assessments during therapy ***(Jungwirth et al., 2012).***