Seminal Plasma Magnesium in Premature Ejaculation

Thesis

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List of Abbreviations

Ach..... Acetyl choline

ATP..... .Adenosine triphosphate

C2H2..... Acetylene

Ca+2..... Calcium

cGMP ..... Cyclic guanosine monophosphate

CLCAs ..... Calcium sensitive chloride channels

Cox-2..... Cyclo-oxygenase-2

DSM-IV-TR..... Diagnostic and statistical manual of mental disorders

ED..... Erectile dysfunction

EDRF ..... Endothelium-Derived Relaxing Factor

EJPs..... Excitatory junctional potentials

eNOs ..... Endothelial nitric oxide synthetase

HNO3 ..... Nitric acid

ICCs ..... Interstitial cells of cajal

IELT ..... Itravaginal ejaculatory latency time

InsP3..... Inositol 1,4,5-triphosphate

K+..... Potassium

MAOIs ..... Monoamine oxidase inhibitors

Mg..... Magnesium

NA ..... Noradrenaline

NANC ..... Nor adrenergic-nor cholinergic

NO..... Nitric oxide

NOS..... Nitric oxide synthase

NPY ..... Neuropeptide

PDE-5inhibitors Type 5 phophodiesterase inhibitors

PE ..... Premature ejaculation

PGE2..... Prostaglandin E2

PGF2α ..... Prostaglandin F2α

PGI2 ..... Prostaglandin I2

RYRs ..... Ryanodine receptors

SSRIs ..... Selective serotonin reuptake inhibitors

STOCs..... Spontaneous outward currents

TXA2 ..... Thromboxane A2

VIP ..... Vaso-active polypeptide

VOCs..... Voltage operated channels

Zn..... Zinc

5-HT..... 5- hydroxy tryptamine

Introduction

Premature ejaculation is the most prevalent sexual disorder in men ***(Godpodinoff, 1989; Rosen, 2000)*** with prevalence of about 22-38 % ***(Roblin, 2000)***. Some attempts to define premature ejaculation were established but the most accepted ones are to define it as brief ejaculatory latency, ejaculation that occurs sooner than desired and loss of control before sexual satisfaction of both sexual partners ***(Lue et al., 2004)***.

Recent studies suggest that medications principally SSRIs could be used as the first line of treatment ***(Lue et al., 2004)*** and others suggest anaesthetic creams, rings and constriction bands ***(Jan Wise, 2000)*** but still further researches are needed for the complete cure of this disorder.

Many researches reported that the pathogenesis of premature ejaculation is mostly due to psychological stress and anxiety ***(American Psychiatric Association, 1994)***, or due to some organic diseases as pelvic congestion and chronic prostatitis ***(Waldinger, 2005).*** Other researchers have reported that some trace elements as zinc, copper and selenium present in semen may play an important role in male sexuality ***(Li Yuyan et al., 2007).*** Magnesium is one of the elements present in human seminal plasma. It is required for enzymes that act on the phosphate-containing substrates. Seminal magnesium level (more than 70 mg/L) is much higher than in serum (17-24 mg/L) ***(Bartis and Ashwood, 2001)*** which suggests that magnesium can play an

important role in male sexuality. Studies also suggested that seminal magnesium level changes are possibly related to the magnesium content of the diet ***(Zavaczki et al., 2003).***

A decrease in the level of magnesium will result in an increase in thromboxane A2 which leads to a rise in endothelial intracellular calcium and a subsequent decline in nitric oxide (NO) ***(Kanmura et al., 1987; Ryzen and Rude, 1990)***. As NO is a vascular smooth muscle-relaxing factor, contraction of the smooth muscle of the genital tract from decreased NO might be a contributing factor to rapid emission and therefore to premature ejaculation ***(Omu et al., 2001; Aloosh et al., 2006).***

There have been few attempts to assess the possible relationship between seminal magnesium and premature ejaculation. Our objective is to evaluate this relationship and to clarify its role in this sexual disorder.

Aim of the Work

The aim of this work is to assess the role of magnesium in the semen of men suffering from premature ejaculation.

(I) Premature Ejaculation

(A) Definition:

Premature ejaculation (PE), unlike erectile dysfunction (ED), affects men of all ages equally from 18 years old to the elderly, however, both premature ejaculation and erectile dysfunction may coexist and often PE can be misdiagnosed as ED in many men and this is in part due to the lack of knowledge about PE, the absence of taking detailed history and the non-existence of diagnostic tools for PE ***(Montague et al., 2004).***

The lack of agreement on a single precise definition of PE has focused scientific research on the causes and management of PE ***(McMahon et al., 2004).*** Various definitions of PE have been used by different authors, and involve partner satisfaction, male voluntary control, duration of ejaculatory latency and number of intravaginal thrusts ***(Jannini et al., 2002).*** A universally accepted definition of PE has yet to be established. One of the earliest definitions of PE is the inability to delay ejaculation long enough for the woman to achieve orgasm 50 % of the time assuming that PE was the only cause of the female anorgasmia ***(Masters and Johnson, 1970).*** Then a concept that PE is primarily a problem of voluntary control over timing of ejaculation was established on which most of the current definitions are based ***(Kaplan et al., 1974).***

The Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (DSM-IV-TR), defines PE similarly but has an added emphasis on the emotional and interpersonal impact of early ejaculation. The American Urological Association Guideline on Premature Ejaculation defines it as ejaculation that occurs sooner than desired, either before or shortly after penetration causing distress to either one or both partners ***(Montague et al., 2004).***

In ***1994, Waldinger et al.*** introduced and defined intravaginal ejaculatory latency time (IELT) as an objective measure for ejaculation time. The IELT is defined as the time from vaginal intromission to intravaginal ejaculation.A distinct advantage of using the IELT is its clear starting and end points, which are important for comparative research purposes. An ejaculation that occurs before intromission has an IELT rating of 0. The range of IELT used to identify PE varies in most studies from 1 to 7 minutes, even though no well-controlled studies have been undertaken regarding normal ejaculatory latency times in men across the typical life span ***(Symonds et al., 2003).*** A large US-European cohort study was conducted to analyze the distribution of IELT in men from different countries ***(Waldinger et al., 2005).*** This study demonstrated that the shape of the IELT distribution is positively skewed with a median IELT of 5.4 minutes and from 0.9 minutes to 1.4 minutes representing the standards of disease definition, so based on these calculations, PE can be defined as a neurobiological dysfunction with an unacceptable increase in