Prevalence of Nocturia among Elderly Males and its Impact on Sleep Quality

Thesis

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First and for most, thanks to ***ALLAH*** *"The Most Merciful"*

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Marian Wagieh Mansour

Contents

List of Abbreviations

ADL	:	Activities of Daily Living
AHI	:	Apnea/ Hypopnea Index
ANP	:	Atrial Natriuretic Peptide
ANV	:	Actual number of Nocturnal Voids
AUA	:	American Urological Association
AVP	:	Arginine vasopressin
BOO	:	Bladder Outlet Obstruction
BPE	:	Benign Prostatic Enlargement
BPH	:	Benign Prostatic Hyperplasia
BPO	:	Benign Prostatic Obstruction
CHF	:	Congestive Heart Failure
COPD	:	Chronic Obstructive Pulmonary Disease
CPAP	:	Continuous Positive Airway Pressure
EDS	:	Excessive Daytime Sleepiness
ER	:	Extended Release
ESS	:	Epworth Sleepiness Scale
FINNO	:	Finnish National Nocturia and Overactive bladder study
GABA	:	Gamma Amino-Butyric Acid
GDS	:	Geriatric Depression Scale
HRQL	:	Health Related Quality of Life
IADL	:	Instrumental Activities of Daily Living
ICS	:	International Continence Society
IPSS	:	International Prostate Symptom Score
LUTS	:	Lower Uinary Tract Symptoms
LUTS/BPH	:	Lower Urinary Tract Symptoms suggestive of Benign Prostatic Hyperplasia

List of Abbreviations (Cont.)

MMSE	:	Mini Menal State Examination
MVV	:	Maximum Voided Volume
NBC	:	Nocturnal Bladder Capacity
NBCi	:	Nocturnal Bladder Capacity index
Ni	:	Nocturia index
Non REM	:	Non Rapid Eye Movement
NP	:	Nocturnal Polyuria
NPi	:	Nocturnal Polyuria index
NUV	:	Nocturnal Urine Volume
OAB	:	Overactive bladder
OR	:	Odds Ratio
OTC	:	Over The Counter
PBS/IC	:	Painful Bladder Syndrome/Interstitial Cystitis
PLMS	:	Periodic Leg Movement Syndrome
PNV	:	Predicted number of Nocturnal Voids
PSQI	:	Pittsburgh Sleep Quality Index
QoL	:	Quality of Life
QoS	:	Quality of Sleep
RBD	:	REM sleep Behavior Disorder
REM	:	Rapid Eye Movement
RLS	:	Restless Leg Syndrome
SDB	:	Sleep Disorder Breathing
SF-12	:	Short Form 12
SPSS	:	Statistical Package for Social Science
SSRI	:	Selective Serotonin Reuptake Inhibitor
US	:	United States
USA	:	United States of America

List of tables

List of tables (Cont.)

Introduction

Nocturia is defined as the complaint that the individual has wake at night one or more time to void **(Peters et al., 1997).**

The standard definition for nocturia, by the international continence society, is waking at night to void, applying to any number of voids at any time during night's sleep; each void is preceeded and followed by sleep and the person is awake before voiding **(Van Kerrebroeck et al., 2002).**

Nocturia is an important cause of sleep disruption in men > 50 years old leading to deterioration of quality of life **(Abrams, 2005).**

Increased severity of nocturia leads to increased sleep disturbance such as frequent awakening and poor sleep **(Schulman et al., 2005).**

Three major conditions inducing nocturia are polyuria (eg, due to excessive fluid intake or diabetes), nocturnal polyuria (eg, due to right-sided congestive heart failure or hypoalbuminemia), and reduced bladder capacity (eg, due to cancer or fibrosis). Reduced bladder capacity, however, is also frequently the result of detrusor overactivity or bladder outlet

obstruction (BOO) in men with lower urinary tract symptoms suggestive of benign prostatic hyperplasia **(Abrams, 2005).** In these patients, nocturia has been regarded as the most bothersome symptom, not only by themselves, but also by their partner **(Peters et al., 1997).**

Iatrogenic factors such as the use of diuretics for hypertension may also contribute to nocturia. Hence, nocturia is increasingly recognised as a urinary disorder in its own, rather than just a symptom of an underlying disease **(Van Kerrebroeck et al., 2002).**

Overlapping causes of frequent urination at night in the aged population have been described, including loss of bladder capacity, decreased glomerular filtration rate, and nocturnal polyuria from decreased arginine vasopressin, incipient diabetes, sleep-disordered breathing, congestive heart failure and/or diuretic use **(Miller, 2000).**

Lower urinary tract symptoms (LUTS) and, more specifically, lower urinary tract symptoms suggestive of benign prostatic hyperplasia (LUTS/BPH) are a common condition in older men **(Thorpe and Neal, 2003).**

LUTS/BPH can be divided into either storage or voiding symptoms. According to the International Continence Society (ICS), voiding symptoms, in the past referred to as ‘‘obstructive’’ symptoms, are experienced during the voiding phase of the micturition cycle and include slow stream, intermittent stream, hesitancy, straining and terminal dribble **(Abrams et al., 2002).**

Storage symptoms, previously referred to as ‘‘irritative/filling’’ symptoms, occur during the storage phase of the micturition cycle and include increased daytime frequency, nocturia, urgency and urinary incontinence **(Abrams et al., 2002).**

Patients generally rate their storage symptoms as the most bothersome, although voiding symptoms are more prevalent **(Eckhardt et al., 2001).**

Indeed, storage symptoms interfere more with daily activities, and hence may have the greatest negative impact on the patient’s QoL in LUTS/BPH patients **(Scarpa, 2001).**

The need for nocturnal micturition in particular is generally considered as one of the most bothersome symptoms associated with LUTS **(Bertaccini et al., 2001).**

Aim of this Work

The aim of this work is to determine the prevalence of nocturia among elderly males and to study the impact of nocturia on sleep quality and health related quality of life.

Nocturia in Elderly

I. Definition:

Nocturia is defined by the International Continence Society as the interruption of sleep one or more times at night to void **(Van Kerrebroeck et al., 2002).**

Although by definition even a single episode of awakening to urinate is nocturia, epidemiological evidence and expert clinical opinion both suggest nocturia is likely clinically meaningful if a patient voids two or more times nightly **(Tikkinen et al., 2010).**

II. Epidemiology:

The estimated prevalence of nocturia has varied, largely due to differences in symptom assessment, study population, data collection, and definitions used **(Hunskaar, 2005).**

In FINNO Study in Finland, the prevalence of nocturia (≥1 void/night) was 37% for men and 43% for women. With the criterion (≥2 voids/night) prevalence was 12% for men and 13% for women **(Tikkinen et al., 2010).**

In a study in USA, sample population had a mean age of 45.8 years old, 31% reported > 1 void/night and 14.2% reported >2 voids/night **(Coyne et al, 2003).**

In all studies, the prevalence of nocturia was observed to increase dramatically with age **(Yoshimura et al., 2004)**.

An increasing prevalence with age has also consistently been reported when different nocturia definitions have been applied **(Tikkinen et al., 2006).**

In a community-based US study, less than 5% of those aged 18- 24 reported two voids per night while the corresponding figures were approximately 15% and 25% for those aged 45-54 and 65-74 respectively **(Coyne et al. 2003).**

In a study from the Netherlands using the ICS definition, nocturia was experienced by 17% of men aged 18-34, 34% of men aged 35-54, 62% of men aged 55-74, and for men over 75 the prevalence was 80% **(van Dijk et al., 2002).**

The figures for women similarly increased with age. Nocturia was noted by 36% of women aged 18-34, by 51% aged 35-54, by 86% aged 55-74, and by 77% in those aged over 75 **(van Dijk et al., 2002).**

Nocturia (defined as at least one void per night) was more common among young women than among young men **(Tikkinen et al., 2010).**

In FINNO Study in Finland, young women (18-29 years) reported over ten times more nocturia than young men **(Tikkinen et al., 2010).**

The prevalence among men started to approach that in women in the age group 40-49 years and reached it at ages 50-59 years, when half of both men and women reported nocturia **(Tikkinen et al., 2010).**

At the age of 50-59 years, approximately 12% of men and 16% of women voided at least twice per night. In older age groups men had more nocturia than women **(Tikkinen et al., 2010).**

Among those aged 60-69, approximately two out of five men and every fourth women voided at least two times per night. At ages 70-79 years, approximately 45 % of men and 37 % of women voided at least twice per night **(Tikkinen et al., 2010).**

III. Pathophysiology:

The pathophysiology of nocturia in the elderly involves the complex interplay of several factors **(Kujubu & Aboseif, 2008).**

Age-related changes in the urinary system and in renal function occur **(Kujubu & Aboseif, 2008).**

Nocturia can pathophysiologically be traced to two main but not mutually exclusive mechanisms: Reduced bladder capacity and Polyuria **(Schneider et al., 2009).**

A reduced bladder capacity often occurs in the context of overactive bladder (OAB), but may also be a causative factor in nocturia occurring in the context of LUTS/BPH (i.e. related to bladder outlet obstruction) **(Abrams, 2005).**

Moreover, reductions of bladder capacity may also occur due to neurogenic causes, bladder wall fibrosis or bladder cancer **(Schneider et al., 2009)**.

Ageing can also contribute to a decrease in bladder capacity **(Weiss & Blaivas, 2002).**