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List of Abbreviations

ADL .....Activities of Daily Life

AF.....Atrial Fibrillation

AGS .....American Geriatrics Society

AMTS.....Abbreviated Mental Test Score

BBS.....Berg Balance Scale

BMI.....Body Mass Index

BP.....Blood Pressure

CAPMAS .....Central Agency for Public Mobilization and Statistics

CLD .....Chronic Liver Disease

cm .....centimeter

CNS .....Central Nervous System

CVD .....Cerebro-Vascular Disease

CVS .....Cerebrovascular Stroke

DM.....Diabetes Mellitus

EF.....Executive Function

Fig.....Figure

FRAT .....Falls Risk Assessment Tool

FRT .....Functional Reach Test

ft .....feet

GDS .....Geriatric Depression Scale

HF .....Heart Failure

IADL .....Instrumental Daily Living

IHD.....Ischemic Heart DISEASE

IQ .....Intelligent Questions

m.....meter

MMSE.....Mini Mental Status Examination

List of Abbreviations (Cont.)

MRI .....Magnetic Resonant Imaging

NSAID.....Non Steroidal Anti-Inflammatory Drugs

O.A .....Osteoarthritis

OH .....Orthostatic Hypotension

OTC .....Over The Counter

PD.....Parkinson's Disease

POMA .....Performance - Oriented Mobility Assessment

QOL .....Quality of Life

SD.....Standard Deviation

Sec .....Second

SLST.....Single Leg Stance Test

SPPB.....Short Physical Performance Battery

SPSS.....Statistical Package for Social Sciences

TST.....Tandem Stance Test

TUG .....Timed Up and Go test

UK .....United Kingdom

US.....United States

USPSTF .....United States Preventive Services Task Force

WHO .....World Health Organization

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Introduction

Falls are one of the most common geriatric syndromes threatening the independence of older persons and it is a misdiagnosed problem in primary care with a substantial impact on healthcare costs ***(Rao, 2005)***.

The World Health Organization, (2007) considers falls in older age as a neglected public health problem in many societies, particularly in the developing world. Many health and social services providers are unprepared to prevent and manage falls in older age as they lack sufficient knowledge to treat the conditions that predisposes their consequences and complications.

Although accidental falls in the elderly have been the subject of extensive research during the past 20 years, it is still a major health problem in a rapidly ageing global population ***(Gillespie et al., 2012).***

The demographic transition that is characterized by population aging is a global phenomenon resulting from factors that include lower fertility rates and increased life expectancy. The number of this age group was estimated to be 688 million in 2006, projected to grow to almost two billion by 2050 ***(World Health Organization, 2007).***

By that time, the population of older people will be much larger than that of children under the age of 14 years for the first time in human history. Moreover, the oldest segment of population aged 80 years and over, particularly prone to falls and its consequences is the fastest growing within older population expected to represent 20% of the older population by 2050***(United Nations, 2004).***

This process of aging is expected to cause major impact on countries' economies and health systems and it is a challenge for clinicians to manage these patients due to their multiple co morbidities ***(Gillespie et al., 2012).***

In Egypt, there is gradual increase in the number of older people over the last few decades. Older people defined as 60 years of age and more constituted 6.1% of the total population in 1996 and is expected to reach 8.9% in 2016 and 10.9% in 2026 ***(Sadek and Abou-Hatab, 2002).***

The last country profile of Egypt showed that the proportion of elderly hit about 7.1 percent of Egypt's total population, bringing the total number of elderly to 5.9 million in 2012, according to the CAPMAS ***(Central Agency for Public Mobilization and Statistics, 2013).***

In 2026 the expected life expectancy for males at birth will be 74.7 years this reflects the importance of providing health care for older people in Egypt ***(Gillespie, 2006).***

Aim of the Study

The aim of this study is to determine the prevalence and common risk factors of falls in a sample of elderly males attending the outpatient clinics in Ain Shams University Hospital.

Chapter (I): Epidemiology of falls in The Elderly

Defining Falls:

The actual definition of a fall in older people has been open to some debate as fall has different meanings for different people. Everyone knows what a fall is; but, when asked to define it, people struggle for words. It seems difficult to translate this complex event in to a concrete definition. Some things are understood when experienced but are difficult to describe in words ***(Zecevic et al., 2006).***

An accidental fall has been defined as a sudden and un intentional change of posture to the ground or a lower level, on to an object, floor, pavement, ground, or any other type of surface, and includes slipping, tripping (stumbling), falling on other people, loss of balance, and accidental stooping ***(Tinetti and Williams, 1997).***

A frequently used definition is "unintentionally coming to the ground or some lower level and other than as a consequence of sustaining violent blow, loss of consciousness, sudden onset of paralysis as in stroke or an epileptic seizures"***(Feder et al., 2000).***

This definition excludes overwhelming external disturbances that result in an older person being knocked over, and major internal disturbances that cause an older person to collapse instead of fall ***(Stubbs and Haslam, 2005).***

A single fall is not always a sign of a major problem and an increased risk for subsequent falls. The fall may simply be an isolated event. However, recurrent falls, should be evaluated for treatable causes ***(Fuller, 2000).***

Recurrent falls are defined as falls that occur at least three times a year **or** more than two falls in a six-month period ***(George and Fuller, 2000).***

Epidemiology:

The majority of falls are not reported. This leads to difficulties in estimating the exact prevalence and incidence of falls in the older population ***(Masud and Morris, 2001).***

Most falls occur indoors. No specific time of day or time of year is associated with falling. Among the elderly, most falls occur during usual activities such as walking ***(Alexander, 2002).***

Indoor falls occur most often in the bathroom, bedroom, and kitchen. About 10% of falls occur on stairs, with descent being more hazardous than ascent. The first and last steps are the most dangerous ***(Alexander, 2002).***

Common sites of outdoor falls are curbs and steps. In institutions, the most common sites of falls are the bedside (during transfers into or out of bed) and the bathroom ***(Fuller, 2000).***

Almost 50% of people who fall require help to get up after at least one fall, but only 10% of falls result in a lie of greater than one hour ***(Todd and Skelton, 2004).***

Epidemiological studies have demonstrated that 28-35 percent of over 65 years will sustain a fall over a one-year period this increases to about 50 percent in the over-75s as they have more co morbidities ***(Rubenstein, 2006).*** Also those who fall once are two to three times as likely to fall again within a year ***(George and Fuller, 2000).***

There is geographic variation in fall injury rates across countries. For instance, a study in the South-East Asia Region found that in China, 6-31% while another, found that in Japan, 20% of older adults fell each year. A study in the region of South America found the proportion of older adults who fell each year ranging from 21.6% in Barbados to 34% in Chile ***(Reyes-Ortiz et al., 2005).***

Unintentional injuries are the fifth leading cause of death in older adults after cardiovascular, neoplastic, cerebrovascular and pulmonary causes. Falls are responsible for two-thirds of the fatalities resulting from unintentional injuries ***(Ganz et al., 2007).***

Approximately 20% of accidental falls require medical attention, and 5% results in a fracture or other serious injuries. The additional psychological and social consequences can be severe, with post-fall syndromes including fear, depression and activity avoidance ***(Tinetti and Kumar, 2010).***

About 1 in 10 falls resulting in a serious soft tissue injury, traumatic brain injury or fracture. Even if non-injurious, falls carry serious consequences including decreases in social and physical activities, physical decline, disability, loss of independence and institutionalization ***(Tinetti and Kumar, 2010).***

Older adults are hospitalized for fall related injuries five times more often than they are for injuries from other causes. The most prevalent fall-related injuries among older adults are fractures of the hip; spine; upper arm; forearm; and bones of the pelvis, hand, and ankle. That has serious repercussions on the lives of family and friends and on health care service utilization and costs the magnitude of the problem of falls ***(Stevens and Olson, 2000).***

Approximately half of all fallers who fracture their hips are never functional walkers again and 20% will die within six months ***(Freeman et al., 2002).*** The overall mortality in the 12 months after a hip fracture ranges from 12 to 67% ***(Alexander, 2002).***

In Egypt the incidence rate of falls was found to be 16.9 per 1000 patient days in Ain Shams University Hospital. Presence of a history of a fall and increased length of hospital stay were highly significant factors that predisposed to falls. Most of falls had no serious consequences, approximately 18% had contusions, 2% had subdural hematomas, and 4% had fractures and lacerations ***(Al Tehewy et al., 2014).***

The falls occurred during hospitalization represent one of the most important instances of the lack of security, and are often responsible for the increase in number of hospitalization days and worse recovery of patients ***(Abreu et al., 2012).***

Studies showed that patient falls happened more frequently in geriatric wards followed by general medical and surgical wards and hospitalization itself may be an important risk factor in falls, representing a deep change in elderly patients' life habits ***(Schwendimann et al., 2008).***

The rate of patient falls was approximately 2 per 1000 patient days in general hospitals and increased in geriatric departments up to approximately 10 per 1000 patient days ***(Corsinovi et al., 2009).*** This falls are responsible for two out of five adverse events in hospitals ***(Severo et al., 2014).***

In1989, Approximately 10% of United Kingdom ambulance service calls are to people over 65 who have fallen. About 60% of cases are taken to hospital. Twenty to thirty percent of those who fall suffer injuries that reduce mobility and independence and increase the risk of premature death ***(Tinetti, 1989).***

In the United States, one in every three older adults falls each year. In 1997, nearly 9,000 persons aged >65 years died from falls. Of those who fall, 20%-30% sustain moderate to severe injuries that reduce mobility and independence and increase the risk for premature death ***(Stevens and Olson, 2000).***

Falls are recorded as a contributing factor in 40% of admissions to nursing homes and the incidence of falls can double after older people are relocated to a new environment and then return to baseline after the first three months ***(Todd and Skelton, 2004).***

The incidence of falls in institutional settings is 1.5 falls per bed per year. Approximately 50% of older people in residential care facilities fall at least once a year and up to 40% fall more than once a year ***(Todd and Skelton, 2004).***

In an Egyptian prospective study at three geriatric homes, the incidence of falls among the residents was 5.3 events/1000 resident-days, and 63.1% of the study participants fell at least once during the study period ***(Khater and Mousa, 2012).***

Most non-injurious falls (75%-80%) are never reported to health professionals. Depression, fear of falling and other psychological problems – "post-fall syndrome" – are common effects of repeated falls. Loss of self-confidence as well as social withdrawal, confusion and loneliness can occur, even when there has been no injury ***(Feder et al., 2000).***

Complications:

Falls are the leading cause of injury, deaths and disabilities among persons aged >65 years. Unintentional falls are one of the most costly and complex health issues facing older persons in the world ***(Shobha, 2005).***

In a study conducted by ***Englander et al., (2001)*** found that the average cost for the medical treatment of an injury from a single fall was $19,440. In 1994 alone the total direct cost of fall related injuries among people 65 and older was $27.3 billion, and it is expected to grow to $43.8 billion by the year 2020.