

## Letter to the Editor

# Balance Impairment and Balance Training in Knee Osteoarthritis

**Naglaa Hussein\***Department of Rheumatology and Rehabilitation,  
Alexandria University, Egypt**\*Corresponding author:** Naglaa Hussein, Department  
of Rheumatology and Rehabilitation, Alexandria  
University, Egypt**Received:** March 04, 2016; **Accepted:** March 07, 2016;**Published:** March 08, 2016

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The great increase in the elderly population worldwide is the most important change in the field of public health in the 21<sup>st</sup> century. It is being estimated that the number of people over the age 65 will be doubled in the next 20 years.

Osteoarthritis is the most prevalent chronic disease affecting the over 65 population. Survey studies have found that in 66-77 age group 46% report having osteoarthritis. The incidence in the 75-79 age groups is estimated between 71% and 85%. The most commonly affected joint in osteoarthritis is the knee joint.

Knee osteoarthritis results in physical disability that interferes with performance of daily life activities and negatively affect life quality.

Balance function has been reported to decline with age as evidence by increased postural sway and decreased stability. One third of the elderly living at home and two thirds of the institutionalized elderly will experience one or more falls per year.

Balance is controlled by sensory input, central processing and neuromuscular response. The sensory components include the

vestibular, visual and proprioceptive systems. An effective motor response requires an intact neuromuscular system and sufficient muscle strength to return the center of mass within the base of support when balance is disturbed.

Knee osteoarthritis impacts the body in many ways including knee strength and proprioception. Age has been shown to have detrimental effect on all the determinants of balance but the determination may be accelerated in areas of proprioception and strength in those with knee osteoarthritis, thus knee osteoarthritis further impair balance.

Both static and dynamic balances have been shown to be impaired in knee osteoarthritis. This is related to several factors including quadriceps weakness, and defective proprioception. Pain associated with knee osteoarthritis may also play a role in balance impairment. Pain may reflex inhibit the muscles around the knee which could compromise effective and timely motor response in postural control. Furthermore pain may result in reduced the loading of the affected joint, potentially jeopardizing an individual's ability to maintain their center of mass within the base of support. Additional factors that affect balance in knee osteoarthritis include joint malalignment and contracture.

Several balance tests including posturgraphy have been developed to determine balance deficit in knee osteoarthritis and among elderly in general.

As balance defect has been documented in patients with knee osteoarthritis, establishment of comprehensive rehabilitation program including the addition of kinesthesia and balance exercise to the usual strength training has shown better functional outcome.