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# **Research Article**

# **OSTEOARTHRITIS IN INDIA: AN EPIDEMIOLOGIC ASPECT**

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#### ARTICLE INFO

#### ABSTRACT

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#### Key Words:

Osteoarthritis, OA Epidemiology, OA prevalence, OA in India, Cartilage disease, Knee joint disease Osteoarthritis (OA) is a disease of cartilage degradation, which results pain in major joints, especially in knee joint. Globally OA ranks eighth in all diseases and covers around 15% proportions among all musculoskeletal problems. Clinical symptoms and radio-diagnosis are the basis of diagnosis used for OAcharacterization. India has higher proliferative rate of OA among world and expected to be at top rank in chronic diseases till 2025. There is very limited literature present on OA epidemiology. This paper tried to compile the regional prevalence of OA among India by using sexual as well as geographical parameters. Andhra Pradesh has highest prevalence among India. In Andhra Pradesh and Bihar, exceptionally males are highly affected than females.

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## **INTRODUCTION**

Osteoarthritis (OA) is an enlightened disorder of cartilage degradation, synovial inflammation, osteophyte formation, thinning of joint space and sub-chondral sclerosis (Attur M et al, 2013; Rousseau J et al, 2012). Cartilage act as cushion between the bones of joints and prevent the rubbing of bones on each other. In between two cartilage of bone joint, synovial fluid filled, which secreted by synovial membrane for lubrication of the joints. OA leads to pain, disability as well as difficulty in joints and restrict the routine movements of human beings (WHO, 2002). OA is highly confused with commonly occurring disease osteoporosis. Both of these are related to joint pain and produce similar physiological symptoms, but difference is in the occurrence site. Osteoporosis affects the bones while OA affects the cartilages. OA is characterised in two categories as primary and secondary. Primary OA is age related and occurs in old age while secondary OA may occur due to accidental injuries or a side-effect of pre occurring diseases. The best way of management of OA is regular exercise and maintenance of diet. It is also recommended to avoid sitting on the ground or with cross-legged position. All body joints may be affected by OA but knee joints are more precious, tracked by the hip (Zhang W *et al*, 2006). OA in lower limbs diminish flexibility of organs and cause stiffness (Andrianakos AA *et al*, 2006).

#### Global Status of Osteoarthritis

OA accounts as most prevalent musculoskeletal disease among the world (Felson DT *et al*, 1998), and ismost common reasons of joint disability in approximately 100 million people among world having age over 45 years (Hinman RS *et al*, 2010), which is approximately 15% of all musculoskeletal disorders (National Collaborating Centre for Chronic Conditions, 2008) (figure-1). More than 50% population over 65 years have radiographic confirmation of OA in any of the joints and younger populationisprone to injury-induced OA.

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Figure 1 OA contribution in musculoskeletal disorders

Europe and USA reflect highest worldwide frequency of OA (Haq I *et al*, 2003). 18% of women and 9.6% of men are universally reported with symptomatic OA in 60 years and higher age group (Wolf AD *et al*, 2003). Globally Knee OA is  $4^{th}$  most significant cause of incapability in women and  $8^{th}$ in men (Azad CS *et al*, 2015). The EULAR (European League against Rheumatism) committee report expresses 30% radiographic evidence of knee OA over the age of 65 years (Jordan KM *et al*, 2003).

#### Osteoarthritisgrade in India

In Indian impact, nearly 80% of population shows OA among the patient who claimed for knee pain, out of which approximately 20% reported incapability in daily activities and around 11% need peculiar care (Hinman RS *et al*, 2002; Ringdahl E *et al*, 2011). Approximately 40% population of more than 70 years shows OA, in which nearly 2% have severe knee pain and disability (Jain S, 2011). Table-1 shows the total as well as sex related percentage distribution of OA reported in several states of India. Increment in age exponentially increases the allied risk of OA, due to progressive changes in routine diet, working milieu conditions and lifestyle patterns (Esser S *et al*, 2011). Percentage of cases reported in several states of India is diagrammaticaly represented in figure-2.



Figure 2 Percentage distribution of Total Osteoarthritis in different state of India.

The incidence of knee OA increase 10 folds amongst the ages of 30 and 65 years (Magrans C T *et al*, 2011). Sexual distribution/contribution of OA in different states in India is reported in figure-3. A survey based study reveals that, "India is predicted as chronic disease capital by 2025 and expected to have 60 million people with arthritis" (Jain S, 2011).



Figure 3 Comparative sexual Percentage representation of Osteoarthritis in different state of India. Table 1 Regional Demographic representation of

Osteoarthritis on the basis of sexual distribution

State	Total OA (in %)	Male OA (in %)	Female OA (in %)	Author
Andhra Pradesh	68.0	72.0	59.5	Supradeepth C et al, 2013
Assam	43.0	26.8	54.1	Hakmaosa A et al, 2014
Bangalore	17.0	15.5	18.8	Ajit NE et al, 2014
Bihar	21.2	16.2	5.0	Barman SK et al, 2014
Delhi	47.3	-	-	Salve H et al, 2010
Jammu & Kashmir	24.9	-	-	Mahajan A et al, 2003
Karnataka	41.3	20.6	57.0	Lena A et al, 2009
Maharashtra	10.2	7.0	11.0	Ganvir SD et al, 2013
Rajasthan	3.66	1.76	4.48	Ranwa et al, 2012
Tamil Nadu	18.6	15.0	19.7	Muthunarayanan L et al, 2015
Uttarakhand	21.2	12.8	14.0	Jadhav VS <i>et al</i> , 2012; Kakkar R <i>et al</i> , 2013
Uttar Pradesh	78.27	-	-	Sood A et al, 2015
West Bengal	49.8	-	-	Manda PK et al, 2009

#### Osteoarthritis in Different Region of India

#### Andhra Pradesh

A study accompanied in the urban and rural areas of district Visakhapatnam, Andhra Pradesh represent 64% morbidity of several types among study population, out of which musculoskeletal disease were most common with 34% morbidity in rural areas while 41% in urban areas (Srinivas PJ *et al*, 2014). Another study conducted in costal Population of Andhra Pradesh, reported knee OA in 68% of (72% male and 59.55% female) patient complaining with joint pain (Supradeepth C *et al*, 2013). Manjubhashini S *et al*. conducted a research on correlation of Depression with several geriatric diseases and reported that Osteoarthritis affects 43.9% population of Vishakhapatnam.

#### Assam

A community based cross sectional study on morbidity pattern of elderly in Raniblock, Kamrup (rural) district, Assam shows 43% morbidity of osteoarthritis consisting 54.1% female and 26.8% male elderly person (Hakmaosa A *et al*, 2014).

#### **Bangalore**

Prevalence of OA was found 17% in the studied population of seven villages (rural area) of Bangalore, by using the modified

ACR (American College of Rheumatology) criteria. Genderspecific prevalence is 15.5% in males and 18.8% in females. As per the EULAR committee 2009 criteria, the overall prevalence was 5.6% in the population, out of which 4.2% in males, and 6.8% in females, while in elderly (60 years and above) population, it is found 54.1%. The prevalence precise to age was found highest in the age group 70 and above (Ajit NE *et al*, 2014). A study led in NIUM hospital Bangalore, reported 83.23% of knee OA among all arthritis. These are graded by using Kellgren-Lawrence grading system and found that maximum cases were in Grade 2. It was also reported according to above study that females are at higher risk than males (Shadab M *et al*, 2014).

#### Bihar

In Bihar, a study on morbidity of geriatric population shows 21.25% arthritis in which contribution of males are 16.25% and females are 5.00% (Barman SK *et al*, 2014).

#### Delhi

A community based urban immigration cross-sectional study in South Delhi reported, the prevalence of knee OA is47.3% in women over 40 years of age, which was diagnosed by using clinical criteria established by ACR for diagnosis of idiopathic OA of knee joints. Prevalence of OA was found to increase with age (Salve H *et al*, 2010). Another study shows 41.1% of knee OA, out of which 37.7% are bilateral knee OA and 3.4% are Unilateral. It is also found significantly higher in females (Singh AK *et al*, 2014).

#### Jammu and Kashmir

Prevalence of various rheumatologic disorders in region around Jammu reported 23.9%, among which 34.7% LBA (Low Back Arthritis), 24.9% OA (Osteoarthritis) 17.9% soft tissue rheumatism, 0.8% RA (Rheumatoid Arthritis) and 18.7% are unclassified arthritis (Mahajan A *et al*, 2003). In a rural community based survey 18.5% were complained for Musculoskeletal pain, out of which 5.8% of OA, 5.5% of Soft tissue rheumatism, 0.51% of RA, 0.85% of unclassified inflammatory arthritis and 0.09% of ankylosing spondylitis were reported (Chopra A *et al*, 2001).

#### Karnataka

A study on elderly population in Udupi Taluk, Karnataka represent 41.3% prevalence of OA having 57% in female and 20.6% in male (Lena A *et al*, 2009). According to another cross-sectional study at Mysore, 150 patients (95 female and 55 male) of knee OA were registered. The prevalence of knee OA patients was higher in the age group of 60-65 and 40-45 and lesser is in the age group of 50-55 (Radha MS *et al*, 2015).

#### Maharashtra

The prevalence of OA estimated according to ACR clinical criteria was 10.2%, which significantly higher among women (11%) than men (7%) in 60-79 years age group. Comparison on the basis of sex shows 65.7% vs. 34.3% (approximately 2:1) female and male ratio respectively (Ganvir SD *et al*, 2013). Another study shows 51.6% postmenopausal risk of OA significantly associated with obesity (Avachat SS *et al*, 2013). According to a cross sectional study, conducted on elderly population in Ahmednagar, West Maharashtra, OA was

reported 24.1%, out of which male contributes 18.5% and female 29.0% (Kamble SV *et al*, 2012).

#### Rajasthan

Arthritis with a prevalence of 8.42% reflects as most common musculoskeletal disease in Rajasthan (Prakash R *et al*, 2004). A study in Bikaner, informed that the prevalence of OA was 3.66%, which consist1.76% males and 4.48% females (Ranwa *et al*, 2012).

#### Tamil Nadu

In a study 43.4% (139 in 320) of elderly study population commonly complaint for joint pains and stiffness (Purty AJ *et al*, 2006). Nearly 80% population with radiographic evidence of OA were estimated but only 60% shows symptomatically. This prevalence has 62:38 female vs. male ratio (Srinivas P *et al*, 2014). Another cross-sectional study in Kanchipuram, Tamil Nadu, report 51.1% of the plaintiffs with pain, out of which Knee pain consist 18.6% with 15% men and 19.7% women (Muthunarayanan L *et al*, 2015). A rural study of Tamil Nadu shows 39% cases of OA, out of which 38% had OA of right knee and 35.5% had OA of left knee. Sexual distribution represents 40.8% prevalence in male and 59.2% in female (Srinivasan S *et al*, 2015).

#### Uttarakhand/ Uttaranchal

Astudy in elderly person of Chandigarh (UT) shows overall 56.6% prevalence of OA which consists 32.6% in rural and 60.3% in urban areas. It is more significant in females in comparison to males (70.1% vs. 41.6%). Prevalence increased with age and shows only 50.2% in 65 to 74 years age group, whereas 97.7% in elderly aged 84 years or older. A positive correlation with body mass index (BMI) was also reported and express 51.36% positivity in BMI below 25, which increased to 100% in 40 or greater BMI (Sharma MK *et al*, 2007). A studies in Aurangabad reported 12.79% males and 14.02% females complain of arthritis among the patients with any systemic disease or physical defects (Jadhav VS *et al*, 2012). Another study of Dehradun shows 21.2% cases with arthritis (Kakkar R *et al*, 2013).

#### Uttar Pradesh

According to a cross-sectional study accompaniedin rural area of Varanasi, Uttar Pradesh, around 85% population with at least one health problem. Out of which the most recurrent health problem is musculoskeletal problem with 56% prevalence (Kumar D *et al*, 2015). Another study conducted in Farrukhabad, Uttar Pradesh, denotes 78.27% prevalence of knee OA among the patient complaining for knee pain. Bilateral knee pain (85.81%) is in higher frequency than unilateral knee pain (14.19%). The data revealed that low income group are more suspicious to knee OA (Sood A *et al*, 2015).

#### West Bengal

A community based study at district Hooghly shows 23.8% prevalence of disability out of which OA accounts 49.8%, and reported as highly prevalent chronic diseases (Manda PK *et al*, 2009). Some studies in Kolkata and Malda also found that the Knee OA is most prevalent in all musculoskeletal problems and females are more prone than males, but exact data was not reported.

# **CONCLUSION AND DISCUSSION**

OA is a progressive musculoskeletal joint disorder of basically Knee, Hip, and Shoulder among which Knee OA is highly prevalent. Bilateral Knee OA is dominant over Unilateral Knee OA. As shown in figure-2, Andhra Pradesh reported as highly prevalent and Rajasthan as minimal prevalent state in India for Knee OA. Obesity, age, gender, educational background and occupation were included in the risk factors of OA. Prevalence of Knee OA is reported more in highly obese geriatric female patients who have low education and did hard work. According to Figure-3 Karnataka shows greater difference in male and female contribution while Uttarakhand have lower difference in such distribution. Generally in all studies from different regions females were reported to be more affected than males from knee OA, but in Andhra Pradesh and Bihar, males were reported to be more affected than females. OA is untreatable with currently available therapeutic options thus there is requirement to blowout awareness about the disease, anticipation, and rehabilitation among community. There is requirement to take suitable steps to make awareness about knee osteoarthritis.

## **Conflict of Interests**

Authors have no conflict of interest affiliated with this article.

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