ORIGINAL ARTICLE

RADIOGRAPHY OF OSTEOARTHRITIS AS AN ABNORMAL ANATOMICAL CHANGE IN GERIATRICS

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ABSTRACT
The aim: A study was aimed to investigate the correlation between the prevalence of osteoarthritis and progression of age.
Materials and methods: A study was conducted on two group of population; it increasing prevalence due to the demographic development of the society has major implications for individual and public healthcare with the increasing necessity for clinical imaging assessment in a high number of individuals. First group included 260 people their ages ranged from 65-70 year old. The second group included 270 elderly people their ages ranged from 71-80 year old. All people under study were imaged by radiography to diagnose different joints and bone affection which includes; a debilitating, degenerative disease of the articular cartilage and synovial fluid. The prevalence of radiographic osteoarthritis in different joints was record 31% in first group (65-70 year) as compare with 69.7% recorded to group two population (71-80 year).
Results: From this study we can conclude that the progression of osteoarthritis after 71 years of age increased significantly. Therefore, the limitations of radiographs in osteoarthritis assessment could be overcome by these techniques.
Conclusions: This article should provide an insight into the most important radiological features prevalence of osteoarthritis and their systematic visualization with different imaging approaches that can be used in clinical, radiologists and referring clinicians to better understand the evolution of symptomatic prevalence of osteoarthritis and the current or future clinical significance of the most common symptomatic and asymptomatic findings.

KEY WORDS: Osteoarthritis, Radiographic, Elderly, Epidemiology

INTRODUCTION

Osteoporosis (OA) is the most common joint disease that affects the elderly to long-term disability. Arthritis causes articular cartilage loss, subarticular bone remodeling, ligament laxity, meniscus damage, osteophyte formations, and in some cases effusion and synovitis [1-2]. Most people are afflicted with osteoarthritis when they age can induce osteoarthritis, bone spurs, joint laxity, meniscal inflammation, and joint fluid (edema) in some patients [3-4]. Harm, stiffness, and injury may be caused by any of these results. Eventually, joint failure can ensue. Osteoarthritis is expected to affect around 27 million American individuals [5]. It is worst for arthritic knees; the probability is 13.83% over the course of a lifespan, according to the Arthritis Foundation (23.87%) [6-7]. many people with arthritis, causing disability of those aged above the age of 65 and affecting over two-thirds of those aged over 75 [70% to 90%]. [8-9]. For individuals between the ages of 25 and 34, the risk of having knee osteoarthritis is approximately 1%; but, the risk rises for older patients to almost 50% by the age of 75. and it was shown to be about 19.2% in the original cohort of the Framingham Study, but around that time it began to rise to over 43% in the wider community because of rising bone deterioration and joint damage in the elderly people who were in that cohort [10]. Conventional radiograph analysis is still considered the easiest and most cost-effective radiological analysis method of diagnosis and follow-up of knee arthritis. The articular cartilage reduction can be seen indirectly by assessing joint space reduction. Usually, joint space narrowing does not occur uniformly over the entire width of the joint and is almost always accompanied by an increase in cartilage sclerosis, figure (1). There are some advantages of imaging with radiography as opposed to other imaging techniques such as computed tomography (CT). Osteoarthritis may be seen in a variety of locations in the body, and in particular is a problem in the vertebral column, and the most significant characteristics include: Narrowing of joint space, also known as osteoarthritis, and cysts, has the common characteristic [11], this study was aimed to investigate the prevalence of OA in different age people.

THE AIM

A study was aimed to investigate the correlation between the prevalence of osteoarthritis and progression of age.

MATERIALS AND METHODS

A study was conducted on two group of population, first group included 260 people their ages ranged from 65-70 year old. The second group included 270 elderly people

Fig 1. Posterior-anterior view of the knee joint in the 'Lyon position', i.e. a 10°caudal angulations for an optimal visualization of the joint space, of the left and right knee joint of a 68-year-old patient with definite knee OA

their ages ranged from 71-80 year old. All people under stud were imaged by Radiological Measurement of Knee OA to diagnose different joints and bone affection to use Conventional X-Ray Radiographyand which includes; a debilitating, degenerative disease of the articular cartilage and synovial fluid.

CONVENTIONAL X-RAY RADIOGRAPHY
Conventional radiographic evaluation is the most frequently used method for determining the diagnosis of knee arthritis, measuring the time course of the disease.In 1957, Kellgren and Lawrence [12] developed the firstAt present, it is still regarded all over the world as the most valid measurement

method for a uniform graduation of the kneeOrganic farming using x-rays. In 1961, the World Health Organization (WHO) accepted the Kellgren-Lawrence method as Standard method of knee externalization from OA.We use this method on the group one this method extracts the severity of knee osteoarthritis as score according to joint area measurementsthe development of osteoblasts in the knee OA has been shown to be associated with presence but not the severity of knee pain and does not appear statistically-Significant association with disease progression,there are some studies that also revealed graduation from the course of evolution, the osteoblasts had better reproducibility than the joint area measurements display.

RADIOGRAPHIC EVALUATION AND MEASUREMENTS
The width of the joint space underlies the assumption that the joint space narrowing during the chronic progressive course of Knee OA is directly related to low cartilage Four size V. However, this assumption is not necessarily correct because the radial joint space is composed not only of cartilage but

Table I. Prevalence of osteoarthritis in two groups of elderly people

Age group	Osteoarthritis %
65-70	31
71-80	69.7
Chi-square value	15.1*
* P<0.05	

Table II. Cortical plate thickness

Knees	Mean (SD) cortical plate thickness (mm)		
	Number	Femoral condyle	Tibial plateau
Reference group	28	0.29 (0.07)	0.37 (0.06)
JSW >3 mm	36	0.54 (0.14)*	0.53 (0.11)*
JSW <3 mm	12	0.59 (0.21)	0.50 (0.09)
JSW <1.5 mm	15	0.53 (0.21)	0.76 (0.16)

Knees grouped according to minimum medial compartmentjoint space width (JSW) measurement: early disease (JSW>3 mm), definite disease (JSW <3 mm), and severe disease (JSW<1.5 mm). Reference group of healthy subjects.
*Significantly different from mean value for healthy reference group (P<0.0001), Mann–Whitney test)
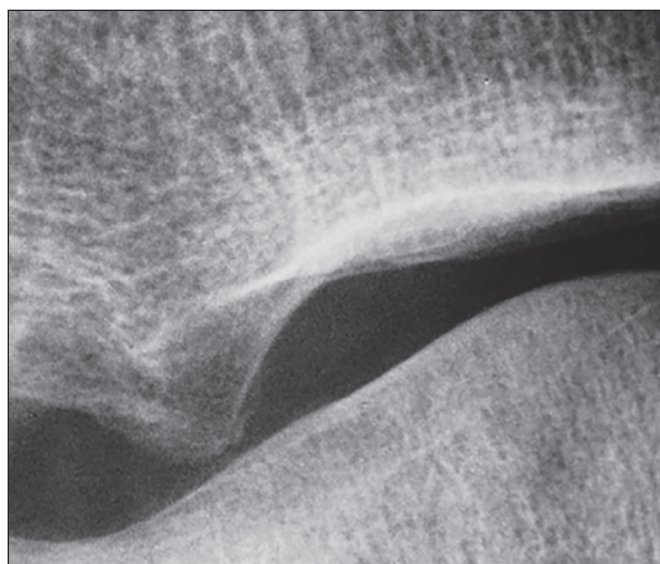*Significantly different from mean value for subgroup of patients with JSW >1.5 mm (P<0.0001), Mann–Whitney test)

Fig 2. Part of the macroradiographs of the medial compartment of osteoarthritic knees, characterized by JSW >2.8 mm

also other structures, such asmenisci, and the evaluation of the latter is highly dependent on the projection technique and/or reliability among readers [13]. In addition, the conventional radiographic measurement of joint space width is relatively insensitive to detect changes within a short period of time. in two years, An observational study, Reynolds et al. [14] It can appear on prospectively collected follow-up images of conventional X-rays, taken at 6-month intervals, That there were no changes in the width of the measurable joint space during the MRI of these patients a significant loss of cartilage was observed.In most radiology departments, posterior–anterior. A view of the knee joint in the "Lion pose", i.e. a 11° caudal angle for a perfect visualization of the joint, recommended figures (1,2).

STATISTICAL ANALYSIS

The chi-square test was used to compare cohorts with respect to different joint groups same time. When looking at the overall score for knee osteoarthritis, the degree of osteoarthritis corresponds to the joint group most affected by the left and right knee.The proportions were compared by two-tailed Fisher's exact test. A p value < 0.01 was considered significant. Agreements between readers were calculated according to a I, II tables.

SUB CORTICAL PLATE

Thickening of the cortical plate under the femoral and tibial cartilage well developed OA knees with minimal or no joints, space narrowing figure (2) 12, the cortical lamina in this, the knees was much larger in the medial disease than him in the side compartment, table (2). Subchondral Laminar thickness did not change during the short-term (18-20 months) longitudinal studies, but was statistically Significantly thicker in the leg than the knees with severe JSN, from the knees with beginning to medium Disease 12, that is, at a stage when the joint is almost the cartilage was lost and the lamina was subchondral Increase in thickness in response to improved mechanical strains.

RESULTS AND DISCUSSION

The results showed that patients with osteoarthritis was recorded significantly in age group between 71-80 years as compared with age group between 65-70 years old table (I), figure (3).

The causes in common with the aging community, such as obesity, joint damage, and physiological anomalies, apply to adults almost as well [13]. Most disorders leading to ageing are stress-related, like OA. Stress is evidently playing a part in the disease's progression in both its virulence and its treatment resistance [14-15]. Mean (standard deviation [SD]) thickness of the subchondral cortical plate (mm) at the femoral and tibial articular surfaces in the medial tibiofemoral compartment of patients with medial compartment disease.

The conclusions of other researchers have reached in other developing countries mirror our results. In the Rot-
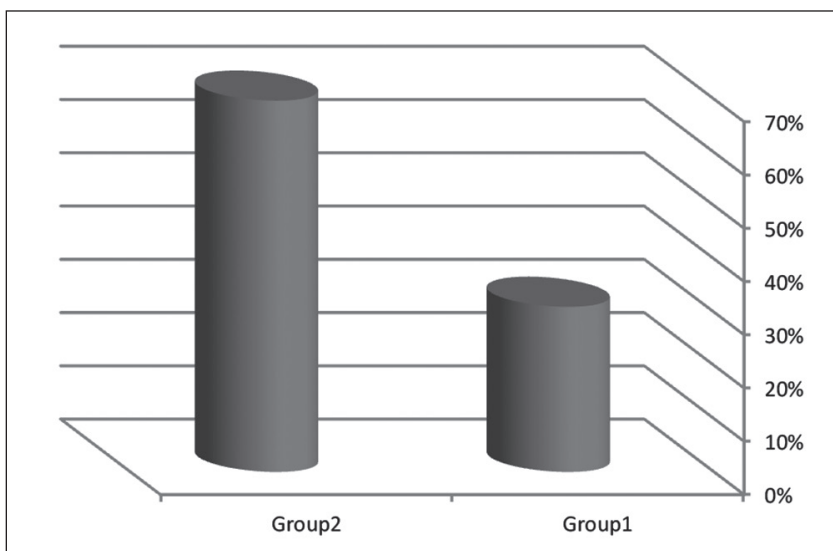

Fig 3. Percent of prevalence of osteoarthritis in two groups of elderly people

terdam Study, the majority of patients are dependent on clinical guidelines, with 16.2% of men aged 75-84 having OA: 16.2% of men and 20% of women having the condition[16]. It found that in the Johnston County region, 48% of men and 49.2% of women over the age of seventy had a serious gambling problem [17]. There are demographic variations, for example, sex, educational level, fitness, and environmental variables that may impact the incidence of dementia across countries. [18-19]. The current results were in agreement with results of [20] that showed that the prevalence of OA was most occurred in age group 70-79 years.

CONCLUSIONS

From this study we can conclude that the progression of osteoarthritis after 71 years of age increased significantly.

REFERENCES

1. Litwic A., Edwards M.H., Dennison E.M., Cooper C. Epidemiology and burden of osteoarthritis. Br Med Bull. 2013; 105: 185.
2. Hutton C.W. Osteoarthritis: the cause not results of joint failure? Ann Rheum Dis. 1989; 48(11): 958.
3. Litwic A., Edwards M.H., Dennison E.M., Cooper C. Epidemiology and burden of osteoarthritis. Br Med Bull. 2013; 105: 185.
4. Hutton C.W. Osteoarthritis: the cause not results of joint failure? Ann Rheum Dis. 1989; 48(11): 958.
5. Lawrence R.C., Felson D.T., Helmick C.G. et al. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part II, Arthritis Rheum. 2008; 58(1): 26–35.
6. Pereira D., Peleteiro B., Araujo J. et al. The effect of osteoarthritis definition on prevalence and incidence estimates: a systematic review. Osteoarthr Cartil. 2011; 19(11): 1270.
7. Losina E., Weinstein A.M., Reichmann W.M. et al. Lifetime risk and age at diagnosis of symptomatic knee osteoarthritis in the US. Arthritis Care Res. 2013; 65(5): 703.
8. Kotlarz H., Gunnarsson C.L., Fang H., Rizzo J.A. Insurer and out-of-pocket costs of osteoarthritis in the US: evidence from national survey data. Arthritis Rheum. 2009; 60(12): 3546.
9. Sowers M., Karvonen-Gutierrez C.A., Jacobson J.A. et al. Associations of anatomical measures from MRI with radiographically defined knee osteoarthritis score, pain, and physical functioning. J Bone Joint Surg Am Vol. 2011; 93(3): 241.
10. Centers for Disease. C, Prevention. Public health and aging: projected prevalence of self-reported arthritis or chronic joint symptoms among persons aged>65 years–United States, 2005–2030. Morb Mortal Wkly Rep. 2003; 52(21): 489.
11. Kellgren J.H., Lawrence J.S. Radiological assessment of osteoarthrosis. Ann Rheum Dis. 1957; 16: 494–502.
12. Murphy L., Schwartz T.A., Helmick C.G. et al. Lifetime risk of symptomatic knee osteoarthritis. Arthritis Rheum. 2008; 59(9): 1207.
13. Bruyere O., Genant H., Kothari M. et al. Longitudinal study of magnetic resonance imaging and standard X-rays to assess disease progression in osteoarthritis. Osteoarthritis Cartilage. 2007; 15: 98–103.
14. Jordan J.M., Helmick C.G., Renner J.B. et al. Prevalence of knee symptoms and radiographic and symptomatic knee osteoarthritis in African Americans and Caucasians: the Johnston County Osteoarthritis Project. The Journal of rheumatology. 2007; 34(1): 172.
15. Bedson J., Croft P.R. The discordance between clinical and radiographic knee osteoarthritis: a systematic search and summary of the literature. BMC musculoskeletal disorders. 2008; 9(1): 1.
16. Duncan R., Peat G., Thomas E. et al. Symptoms and radiographic osteoarthritis: not as discordant as they are made out to be? Annals of the rheumatic diseases. 2007; 66(1): 86-91.
17. Garstang S.V., Stitik T.P. Osteoarthritis: epidemiology, risk factors, and pathophysiology. American journal of physical medicine & rehabilitation. 2006; 85(11): 2-11.
18. Neogi T., Zhang Y. Epidemiology of osteoarthritis. Rheumatic Disease Clinics. 2013; 39(1): 1-9.
19. Loeser R.F. Aging and osteoarthritis. Current opinion in rheumatology. 2011; 23(5): 492.
20. Li Y., Wei X., Zhou J., Wei L. The age-related changes in cartilage and osteoarthritis. BioMed research international. 2013, 20p.
21. Kumar P. Prevalence of Knee Osteoarthritis among Elderly Patients Attending Orthopaedics Department: A Hospital Based Study. International Archives of BioMedical and Clinical Research. 2017;3(2): 115-117.

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The Authors declare no conflict of interest.

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A - Work concept and design, **B** – Data collection and analysis, **C** – Responsibility for statistical analysis, **D** – Writing the article, **E** – Critical review, **F** – Final approval of the article