RESEARCH ARTICLE

PREVALENCE OF RADIOGRAPHIC FINDINGS ASSOCIATED WITH KNEE ARTHROSIS, ACCORDING TO KELLGREN-LAWRENCE CLASSIFICATION IN MILITARY OF THE UNIT SPECIAL OPERATIONS OF SEMAR

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ARTICLE INFO

ABSTRACT

Objective: To determine the prevalence of various radiographic findings associated with osteoarthritis of the knee, according to Kellgren-Lawrence classification in military special operations unit of the Mexican Navy.
Material and Methods: Medical history and musculoskeletal current symptoms of knee were questioned, anthropometric data were collected and radiographs of both knees which were performed corresponding measurements were obtained, the data obtained from each patient were collected and statistical analysis was performed using measures central tendency and dispersion, frequencies and Percentages. They test Kolmogorov-Smirnov, Chi Square, Student T / Mann Whitney U test, ANOVA / Kruskal Wallis and binary logistic regression were applied.
Results: The prevalence of knee osteoarthritis was 55% in staff UNOPES, other radiographic findings as high patella, low and patellar lateralization which are associated with osteoarthritis are identified, there is significant association (p <0.05) between osteoarthritis and number of hops .
Conclusions: An increased prevalence compared to that found in literature was identified, so an endemic health problem in the military population, which should be addressed through prevention and health promotion to limit joint damage and prevent further complications would be considered.

INTRODUCTION

Osteoarthrosis (OA) is one of the world's leading health problems because of its high prevalence in the general population, it is one of the most common causes of permanent disability in adults over 65; The knee is the joint with greater affection of osteoarthritis than hip, shoulder and spine (Van den Berg, 2011). OA has been defined by several decades as a degenerative articular process characterized by progressive loss of articular cartilage, marginal bone hypertrophy (osteophytes) and changes in the synovial membrane, however it is now recognized that there is a gene pattern and proteomic in this disease Of inflammatory characteristics similar to those found in diseases as diverse as rheumatoid arthritis or metabolic syndrome, as well as the higher frequency of presentation of this entity in young adult patients, so the inflammatory component is now recognized as a fundamental part (Mishra, 2011; Martínez, 2015). In Mexico, the knee osteoarthritis is one of the leading causes of disability after 40 years. Before the age of 50 men have a higher prevalence, but after age 50 the prevalence and incidence is much higher in women. There are no statistical records of the prevalence or incidence of knee osteoarthritis in Mexican military population, however, according to a study conducted in the United States military population, the overall adjusted incidence rate among all active duty members was Of 7.86 cases per 1,000 people / year with

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an adjusted incidence rate for osteoarthritis that was 19 times higher than non-military persons (Cameron, 2011). Military personnel are exposed to two major risk factors for developing osteoarthritis of the knee, such as anatomic abnormalities of the knee such as low patella, high patella, patellar lateralization, and in the case of high patella, is associated With greater loss of volume of the patella cartilage and increased cartilage defects in warm femoral compartments, suggesting that it may induce local patellar cartilage loss as well as the risk of worsening structural abnormalities in tibiofemoral compartments and Labor activities involving repetitive movements, movements in forced postures, mainly forced knee flexion movements such as kneeling, and static muscle overload with inappropriate postures (Wang, 2015; Muraki, 2011).

MATERIALS AND METHODS

An observational and cross-sectional study was carried out. A sample of 81 healthy soldiers without diagnosed knee osteomuscular disease was obtained, which belong to the Special Operations Unit of the Secretary of the Navy; A questionnaire was used to collect personal information and anthropometric data (weight, height and body mass index), the current condition was documented with the presence or absence of knee pain, later the study subjects were referred to the General Hospital Naval of High Specialty to carry out the studies of cabinet where the following projections were obtained: radiographs of both knees in anteroposterior standing in complete extension and posteroanterior to 45 ° of flexion (technique of Rosenberg), lateral projection at 30 ° of flexion, axial projections At 45 °, a review of the radiographs was carried out through the computer software "Magicweb" to visualize the radiographs in digital form, the various radiographic measurements were applied, such as the femorotibial angle, the Blumensaat line and the centering of the label, and The degree of knee osteoarthritis was determined under the Kellgren-Lawrence radiological classification.

Means and standard deviations, frequencies and percentages were determined. The Kolmogorov-Smirnov test, Chi square, Fisher's exact test, Student's t test, Mann Whitney's U test, ANOVA, Kruskall Wallis were applied. Data were processed using the SPSSv19 program and the GraphPad Prism v5 program. A value of $p < 0.05$ was taken as statistical significance.

RESULTS

We studied 81 UNOPES soldiers who met the selection criteria. In relation to sex, 95.1% (77 cases) were male. The mean overall age was 31.19 ± 5.9 (minimum 20 maximum 43 years); In relation to sex, women were older than men (35.4.61 ± 4.61 vs 30.99 ± 5.91 years, p = 0.18). Only 2.5% (2 cases) had associated non-musculoskeletal disease. On the other hand, 50.6% (41 cases) were obese / overweight; When questioning the military regarding their antecedents, no history of traumatic knee injuries was found in 87.7% of the cases (71), while, of the 100% who presented (10 cases), 20% had a sprain of Knee, 50% some direct trauma and the remaining 30% presented gonalgia. With respect to musculoskeletal symptoms, gonalgia was identified as the only symptom, with a frequency of 42% (34 cases) of the whole sample, of which 52% (18 cases) had unilateral or bilateral knee osteoarthritis.

Table 1 shows the radiographic findings of knee osteoarthritis and its classification.In the analysis of the radiographs, in addition to the gonarthrosis, other lesions were observed, these are shown in table 2. It can be seen that the most frequent were high patella, high patella plus patellar lateralization and patellar lateralization. We observed that another finding or pathology in this region (p = 0.04) was identified in 65% of the patients with gonarthrosis. The association of gonarthrosis with high patella and high patella / patellar lateralization was more frequent (22.2% respectively), followed by Patellar lateralization (13.3%) and patellofemoral arthrosis, patella low / patellar lateralization in 4.4% of cases respectively.

Table 1. Results of radiographic findings of knee osteoarthritis according to Kellgren and Lawrence classification

		Radiological classification of knee osteoarthritis according to Kellgren and Lawrence			Total
		NORMAL	GRADE I	GRADE II	
DIAGNOSIS OF KNEE ARTHROSIS	NO	36	0	0	36
	LEFT	0	3	0	3
	RIGHT	0	5	0	5
	BILATERAL	0	30	7	37
Total		36	38	7	81

Source: Data obtained from the present study.

Table 2. Additional pathologies observed in the X-ray analysis

	Frecuencia		Frecuencia
High patella	37.8% (17)	Patella low, patellofemoral arthrosis	4.4% (2)
High Patella, Patellar Lateralization	24.4% (11)	Patella low	2.3% (1)
Patellar Lateralization	20% (9)	Patella low / patellar lateralization	2.3% (1)
Patellofemoral osteoarthritis	8,8% (4)		

Table 3. Relation of the diagnosis of knee arthrosis with clinical data

	Knee arthrosis			
	YES (n=45)	NO (n=36)	P	OR (IC95%)
Obesity / Overweight	60% (27)	38.9% (14)	0.04*	2.4 (0.96-5.78)
Background OM injury	17.8% (8)	5.6% (2)	0.09	3.7 (0.72-18.53)
Another knee injury	66.7% (30)	44.4% (16)	0.04*	2.5 (1.01-6.14)
Symptomatology	40% (18)	44.4% (16)	0.43	-

*Statistical significance, OM = osteomuscular
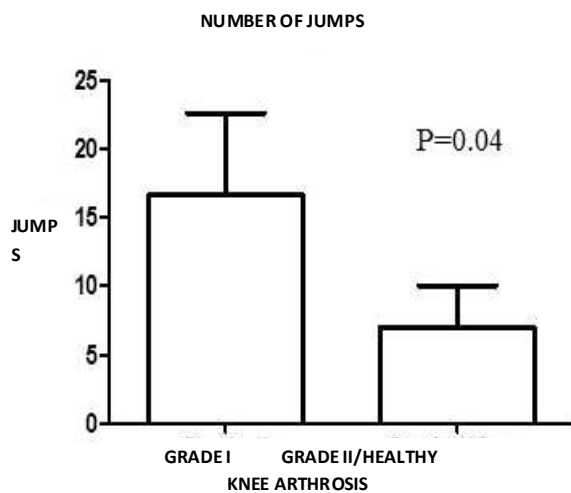Source: Data obtained from the present study

NUMBER OF JUMPS

Figure 1. Association of the number of jumps with the finding of knee osteoarthritis

Table 3 shows the relationship between the radiographic diagnosis of gonarthrosis with risk factors and other important clinical data. We found an association with obesity / overweight and the presence of other knee injuries. It is interesting that subjects with a history of osteomuscular injury, have 4 times more risk of developing gonarthrosis. Figure 1 shows the relationship of knee osteoarthritis with the number of jumps. It can be seen that significant difference was found with the number of jumps (16.99 ± 21.71 vs 7.71 ± 7.18, p <0.05) was also higher in these patients with knee affection, as well as age (31.54 ± 5.8 years vs 27.43 ± 6.04 years). It should be mentioned that all patients who had more than 16 jumps on average had a 9-fold increased risk of osteoarthritis of the knee grade II (95% confidence interval = 1.6-51.15, p = 0.01). Of the patients with obesity / overweight, 57.14% had high patella lesions, 21.42% lesions suggestive of patellofemoral arthrosis, 14.3% patellar lateralization and 7.14% lesions of low patella (p> 0.05).

DISCUSSION

The prevalence of osteoarthritis in Mexico is documented in 10.5% and specific knee up to 25%, being more common in women according to that study (Pelaez, 2011) however, According to the descriptive analysis of the data obtained, a prevalence of osteoarthritis of the knee of 55% was obtained, not being significant the results of prevalence in women for not being a homogeneous sample since only 4 participants of the study of the female sex were obtained; In turn, 84.4% of patients with knee osteoarthritis were found in grade I and the remainder grade II of the Kellgren-Lawrence scale. In this study (Wang, 2015) The association of high patella is presented with osteoarthritis of the knee since there is greater loss of patellar cartilage volume and increased cartilage defects in tibiofemoral compartments , suggesting that it may induce the loss of local patellar cartilage, as well as the risk of worsening structural abnormalities in warm femoral compartments, results were obtained according to what was cited in the study since the association of knee and other osteoarthritis Radiographic findings, such as high, low and lateralization of the patella, obtained a p <0.04, which is significant, with 65% of patients with knee osteoarthritis presenting with another radiographic findings.

Gonalgia as the only osteomuscular symptom was reported in 42% of the sample, of which 52% presented some degree of knee osteoarthritis, which determines that there is no direct correlation between the degree of joint deterioration radiological and clinical presentation patient (Taylor, 2009)

In this study (Yoshimura, 2012) the body mass index greater than 26.6 kg / m2 is presented as cohort point to establish that above this value is considered a risk factor in our study Overweight and obesity occurred in 50.6% of the cases, which corresponds to 65% of these cases presenting osteoarthritis of the knee, with a p <0.04, which is statistically significant. The activity overload and repetition leading to cumulative chronic condition as is the knee osteoarthritis, as mentioned in the above study (Sobrino, 2003) was evaluated in our study through the number of Jumps in parachute during the active service obtaining that the patient with greater number of jumps were the ones that presented in greater number osteoarthrosis of knee in any of its degrees, in turn that the risk of presenting or of progressing the arthrosis of knee, increases With the highest exposure to parachute jumps up to 9 times more.

At the same time, a significant association was found between radiographic findings such as low patella, discharge, lateralization and patellofemoral arthrosis, increasing the risk of its presentation directly proportional to the number of jumps, remembering that the high and low patella are anatomical variants, Which are not associated with external risk factors, however, patellofemoral arthritis if associated. One of the most important contributions of our study was the ability to determine the prevalence of knee osteoarthritis and other radiographic findings in military personnel, since it is a public health problem in the population, but in our country it is an endemic issue (Cameron, 2011) presented a much higher prevalence and incidence than in the civilian population, so this increases health care costs for prolonged early stages based drugs and other conservative management (Langworthy, 2014).

Conclusion

The present study was able to identify the prevalence of osteoarthritis and other additional radiographic findings, such as low patella, high and patellar lateralization, in military personnel of UNOPES, obtaining a prevalence of more than 50%, and that in the majority of These cases did not present any type of symptomatology that could guide us with the diagnosis, which is a result that alarm because most of the cases are young people under 45 years of age, and as it is known , Osteoarthritis is a degenerative and progressive disease that can lead us to total joint replacement, with all of this validating our hypothesis when determining a prevalence higher than expected in the population that is not exposed to risk factors and in turn was obtained A significant association between the radiographic findings and the risk factors to which the military population is exposed. The aforementioned military personnel perform physical activities such as daily physical conditioning, military and operational guards with tactical equipment of more than 25 kg, as well as courses and practices of skydiving, which coupled with the time of active service, make a strong association to appear as factors Of risk for the onset, development and progression of the disease, which opens a new line of investigation to determine how many retired military personnel who have performed this type

of activities have required some kind of surgical or conservative treatment for gonarthrosis in Advanced stages. It is important to note that other anatomical abnormalities were identified in several of the cases studied, such as high patella, low patella and patellar lateralization, which are changes in the anatomy that modify the mechanical and anatomical axis and that condition greater stress in the joint Because of the poor distribution of loads, so they are risk factors for developing osteoarthritis and that as in this population that develop activities specific to their military profession, this risk could be increased, so it would be vital to be able to identify this type of Anatomical alterations before admission to active service to avoid functional disabilities at a young age and that diminish the operational capacity of the Secretary of Marine of Mexico.

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