



Original Article

Epidemiological profile of patients diagnosed with athletic pubalgia[☆]



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ABSTRACT

Objective: To evaluate the clinical and epidemiological characteristics of pubalgia in patients from a Sports Medicine Center.

Methods: Data analysis from medical records of patients with athletic pubalgia attended to from January 2007 to January 2015. The diagnosis was made by an experienced hip surgeon, complemented with pelvic X-ray, abdominal wall ultrasound, and magnetic resonance imaging of the pelvis.

Results: Among 43 patients, 42 were men, with mean age of 33 years. As for sports, 25 (58.1%) athletes were soccer players and 13 (30.2%) were runners; 37.2% were professional athletes. Inguinal hernia was diagnosed in 20.9% of patients, showing the importance of its routine search in these patients. Treatment duration ranged from 1 to 12 months and 95.2% of the patients returned to sport.

Conclusion: This study presented the epidemiological characteristics of patients diagnosed with athletic pubalgia attended to in a reference medical center and demonstrated the prevalence of this lesion in male patients, soccer players and runners. It also disclosed a high success rate of the nonoperative treatment, and high rate of return to sport after treatment.

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Perfil epidemiológico dos pacientes com diagnóstico de pubalgia do atleta

R E S U M O

Palavras-chave:

Traumatismos em atletas

Sínfise pubiana

Hérnia

Esportes

Objetivo: Avaliar as características clínico-epidemiológicas da pubalgia do atleta nos pacientes de um centro de referência no atendimento a esportistas.

Métodos: Avaliação dos prontuários de pacientes com pubalgia do atleta atendidos entre janeiro de 2007 e janeiro de 2015. O diagnóstico foi feito pelo exame clínico feito por ortopedista pós-graduado em quadril, complementado com radiografia de bacia, ultrassonografia de parede abdominal e ressonância magnética da pelve.

Resultados: Dos 43 pacientes avaliados, 42 eram homens, com média de 33 anos. Quanto aos esportes, 25 (58,1%) atletas praticavam futebol e 13 (30,2%) eram corredores; 37,2% eram atletas profissionais. Foi diagnosticada hérnia inguinal em 20,9% dos pacientes, o que demonstra a importância de sua pesquisa rotineira nesses pacientes. A duração do tratamento variou de um a 12 meses e 95,2% dos pacientes retornaram ao esporte.

Conclusão: O presente estudo apresenta as características epidemiológicas dos pacientes com diagnóstico de pubalgia do atleta atendidos num centro de referência e demonstra o predomínio dessa lesão nos pacientes do sexo masculino praticantes de futebol e de corrida. Mostra também alta taxa de sucesso do tratamento não operatório, bem como elevado índice de retorno à prática esportiva após tratamento.

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Introduction

Pain in the groin area and the pubis is common cause of abandon and retirement in many sports, which shows the importance of diagnosis and treatment in this population.¹ The differential diagnoses include athletic pubalgia, intra-articular hip pathologies (such as labral/femoroacetabular impingement), traumatic myotendinous ruptures (hip adductors, rectus abdominis), and diseases of the abdominal wall, especially inguinal hernias.²

Athletic pubalgia is characterized by chronic pain in the pubic or inguinal area, associated with physical exertion in sports that require sudden changes in the direction of movement or repetitive kicks. The most common sports, in decreasing order of incidence, are: soccer, ice hockey, American football, athletics, baseball, basketball, tennis, and swimming.^{1,2} Data from Major League Soccer and from the National Hockey League in the United States suggest that 9–18% of their athletes suffer or have suffered some sort of discomfort compatible with athletic pubalgia.³

A search for articles in Portuguese demonstrated the scarcity of publications on the subject in Brazil.

The objective of this study was to evaluate the clinical and epidemiological characteristics of the athletic pubalgia in a sports traumatology service, and to establish a correlation with the sports practiced, gender, age, and rate of return to the sport after treatment.

Material and methods

In this observational study, the medical records of all patients attending an outpatient sports hip clinic from January 2007 to

January 2015 were manually analyzed. For the present study, only charts of patients with definite diagnosis of athletic pubalgia (59) were included. Of these, 15 were excluded due to loss of follow-up and one recurrence of the condition. Thus, the analyzed sample was composed of 43 patients. In the medical charts, data were recorded in a protocol of care for these athletes ([Appendix 1](#)). Physical examination was performed by the orthopedic surgeon responsible for the hip clinic at the time of care.

Criteria used for diagnosis of athletic pubalgia were presence of insidious and progressive pain in the pubic region and/or adductor zone; positive clinical test (squeeze test and adduction against resistance) and hip radiograph with hyperdensity in the pubic symphysis with or without the presence of osteophytes, or positive flamingo test (asymmetry in the pubic symphysis greater than 2mm). The radiographic changes should be complemented by ultrasound, with evidence of altered echogenicity of the adductor longus tendon, with chronic aspect, and absence of abdominal wall hernias. In the cases of diagnostic uncertainty after clinical examination, radiography, ultrasonography, and magnetic resonance imaging (MRI) of the pelvis was requested. The diagnosis was defined classically by signal change in the aponeurosis of the adductor longus tendon and/or rectus abdominis.⁴⁻⁷

The variables were analyzed descriptively with the relevant descriptive measures: mean, standard deviation (SD), quartiles (Q1: first quartile, Q2: median, Q3: third quartile), minimum and maximum values for quantitative variables, and absolute (n) and relative frequency (%) for categorical variables.

The recurrence rate and its 95% confidence interval were estimated by the Wilson method.

SPSS version 18.0 was used for the statistical analysis.

Table 1 – Descriptive analysis of the sample of 43 patients.

Age (years)	
Mean (SD)	32.8 (12.4)
Median	31
Minimum–maximum	16–67
Age – n (%)	
<20 years	4 (9.3)
20–29 years	16 (37.2)
30–39 years	12 (27.9)
40–49 years	5 (11.6)
≥50 years	6 (14.0)
Gender – n (%)	
Female	1 (2.3)
Male	42 (97.7)
Sport – n (%)	
Athletics	10 (23.3)
Athletics and capoeira fight	1 (2.3)
Athletics and swimming	1 (2.3)
Classical Ballet	1 (2.3)
Basketball	1 (2.3)
Cycling and soccer	1 (2.3)
Circus and football	1 (2.3)
Soccer	22 (51.2)
Soccer and athletics	1 (2.3)
Jiu-jitsu	1 (2.3)
Judo	1 (2.3)
Karate	1 (2.3)
Rodeo	1 (2.3)
Category – n (%)	
Amateur	21 (48.8)
Professional	16 (37.2)
Recreational	6 (14.0)
Dominance – n (%)	
Left	9 (20.9)
Right	34 (79.1)
Resistance training – n (%)	
No	25 (58.1)
Yes	18 (41.9)
Frequency of resistance training – n (%)	
None	25 (58.1)
1x/week	2 (4.7)
2x/week	8 (18.6)
3x/week	6 (14.0)
4x/week	2 (4.7)
Time between sport initiation and symptom onset (years)	
Mean (SD)	11.7 (8.6)
Median (Q1; Q3)	10 (5; 17.25)
Minimum–maximum	1–40
Time between symptom onset and definitive diagnosis (months)	
Mean (SD)	9.2 (10.9)
Median (Q1; Q3)	6 (3; 12)
Minimum–maximum	1–53
Diagnoses prior to the definitive diagnosis – n (%)	
No	40 (95.2)
Yes	2 (4.8)
Other orthopedic pathologies – n (%)	
No	29 (67.4)
Yes	14 (32.6)

Table 1 (Continued)

Comorbidities – n (%)	
No	34 (79.1)
Yes	9 (20.9)
Physiotherapy time (months)	
Mean (SD)	4.6 (2.5)
Median (Q1; Q3)	4 (3; 6)
Minimum–Maximum	1–12
Injections – n (%)	
No	35 (83.3)
Yes	7 (16.7)
Surgery – n (%)	
No	40 (95.2)
Yes	2 (4.8)
Injury leave – n (%)	
No	28 (66.7)
Yes	14 (33.3)
Return to sports practice – n (%)	
No	2 (4.8)
Yes	40 (95.2)
Recurrence – n (%)	
No	39 (90.7)
Yes	4 (9.3)
95% CI	[3.7; 21.7]

The study was approved by the Research Ethics Committee through the Platform Brazil, under the Certificate of Presentation for Ethical Assessment (Certificado de Apresentação para Apreciação Ética [CAAE]) No. 1993615.5.0000.5505.

Results

Patients were predominantly male (97.7%), and age ranged from 16 to 67 years, mean 32.8 years (SD = 12.4 years).

Regarding sports, it is noteworthy that 25 (58.1%) athletes practiced soccer and 13 (30.2%), athletics. As for the category, 37.2% (16 patients) were professional athletes, who practiced athletics (two), classical ballet, circus, soccer (ten), judo, and karate.

Of the 25 soccer players, 14 reported a position: 21.4% were strikers; 14.3%, goalkeepers; 14.3%, full-backs; 7.1%, right midfielders; 7.1%, left midfielders; and 35.7%, defenders.

Most patients were right-handed (79.1%) and 41.5% performed resistance training one to four times a week.

The time between start of the sport and symptoms varied between one and 40 years, with a median of ten (Q1 = 5 years; Q3 = 17); the time between symptom onset and definitive diagnosis ranged from one to 53 months, with a median of six months (Q1 = 3; Q3 = 12 months).

Only 4.8% of patients received another diagnosis prior to the definitive diagnosis (acute injury of the adductor muscles).

In this sample, 32.6% of patients had other orthopedic diseases: hip arthrosis, ischial bursitis, trochanteric bursitis, trochanteric bursitis associated with tendinopathy of the gluteus minimus, gluteus medius tendinopathy, patellar chondropathy, bilateral femoroacetabular impingement (three), iliotibial band friction, anterior cruciate ligament (ACL)

injury, synovial plica in the knee, and anterior knee pain syndrome.

Non-orthopedic diagnoses were present in 20.9% of patients; all these diagnoses were of inguinal hernia.

Therapy duration varied from one to 12 months, with a median of four (Q1 = 3 months; Q3 = 6 months).

As for the other treatments, 16.7% of patients had between one and six injections and 4.8% underwent surgery: tenotomy of the adductor longus and debridement of the pubic symphysis.

Regarding injury leaves, 33.3% of patients required leaves of one month to one year and 95.2% returned to the sport; only one patient subjectively reported a return to a level inferior to that prior to the injury.

Reoccurrences were observed in four patients (9.3%), with the 95% CI ranging between 3.7% and 21.7%.

Table 1 presents the detailed analysis of the results observed in the sample of 43 patients.

Discussion

It is believed that athletic pubalgia has a multifactorial etiology; two theories are noteworthy. The first is based on the concept of muscle injury in the pubic symphysis, popularized by Taylor et al.,³ Gilmore,⁸ and Williams and Foster.⁹ Considering the pubic symphysis as a fulcrum, the imbalance of forces between the (weakened) abdominal muscles and the hip adductors leads to injury of the abdominal muscles.^{3,8,9} The second theory involves the concept of hidden hernia (pre-hernia, incipient hernia) secondary to a defect of the posterior wall of the inguinal canal (formed by the transverse fascia), whose diagnosis can be confirmed through the visualization of a protuberance in the posterior wall of the inguinal canal during dynamic ultrasonography (Valsalva maneuver).^{10,11} A literature review article proposed that these theories should be merged; that is, the muscle injury (single or multiple microlesions), which involves one or more muscles/pubic structures (e.g., the aponeurosis of the external oblique muscle, rectus abdominis, conjoint tendon), would secondarily cause the incipient hernia, but the muscle injury would be the source of pain.¹²

More recent clinical and biomechanical studies also postulate femoroacetabular impingement (FAI) as another possible precursor of athletic pubalgia. The decrease in the internal rotation amplitude of the hip in patients with FAI causes an increase in the physiological range of motion of the pubic symphysis. In athletes with high demand on the hip joint, FAI would trigger injury due to pubic symphysis overload.^{13,14} Recent literature shows an association of pubalgia with hip diseases in 15% of cases.¹⁵

The syndrome is more common in men; in the present study, there was only one female, an amateur soccer player. It is believed that the gynecoid pelvis acts as a protective factor for the disease, probably due to the greater insertion area to the abdominal muscles, which would increase the surface for the distribution of forces.¹² Nevertheless, in a study with 8,490 patients, Meyers et al.¹⁵ observed an increase from 1% to 15% in the number of women affected in the last 20 years.

The syndrome has an insidious characteristic; the athlete usually seeks care several months after the onset of symptoms. Even with pain, it is noted that the patient can compete despite losing performance during the competition/season. A decrease in the intensity of training can also be observed, but not necessarily absence from competitions.¹² In the present study, one-third of patients required injury leave.

The pubic region has been characterized as the “Bermuda Triangle” of sports medicine, due to the challenging diagnosis in this anatomical region. The syndrome lacks a definitive diagnostic criteria and, therefore, the diagnosis should be made by exclusion.^{16,17} Hip pathologies (labral tear, IFA) and injuries of the adductor muscles are difficult to differentiate and may even coexist. Stress fractures of the pelvis and hip should also be included in the differential diagnosis.¹⁷ Genitourinary diseases such as epididymitis, prostatitis, and testicular tumors should be ruled out in men, as well as intrapelvic diseases in women, such as endometriosis, ovarian cysts, and inflammatory pelvic disease. Inflammatory/infectious diseases such as inflammatory bowel disease, diverticulitis, urinary tract infection, and osteomyelitis, as well as tumor lesions, should be excluded.¹² In this study, nine patients were diagnosed with inguinal hernia; ultrasounds are routinely performed in this service. Of the five patients who underwent conventional hernia repair performed by the general surgery team of the institution, two evolved with persistent symptoms of pubalgia, which demonstrates the diagnostic challenge, suggesting the coexistence of pathologies in different systems and that the inguinal hernia is not the single cause pain in the athletic pubalgia.^{12,15} Meyers et al.¹⁵ observed that 4.6% of 5460 patients operated for pubalgia had previously undergone traditional hernia repair without success.

The recommended initial treatment is conservative and consists of rest, physical therapy, and non-steroidal anti-inflammatory injection with corticoids in the insertion region of the rectus abdominis and adductor longus muscles. Surgery is indicated in cases of failure of conservative treatment, which is stipulated to have a mean duration of three months.¹² In the present study, a success rate of 95.2% was observed in the conservative treatment. The two patients who underwent surgical treatment (adductor tenotomy and one adductor tenotomy associated with trapezoidal resection of the pubic symphysis) developed recurrence of the painful clinical picture, but were lost to follow-up, and thus the exact causes of recurrence was not determined. According to Meyers et al., there are at least 17 anatomical structures around the pubic symphysis that may be altered in athletic pubalgia, in an isolated or combined manner.¹⁵ These authors report the possibility of 26 different procedures that encompass all such structures, with over 100 possible combinations of procedures for patients with multiple structures that are uni- or bilaterally involved with respect to the symphysis pubis. Of the 5460 patients operated by the authors, 95% returned to sport practice after surgery.¹⁵

Knowledge about the pathophysiology of athletic pubalgia has increased in recent years, contributing to developments in preventive training protocols and positively impacting the careers of many athletes.¹⁵

Conclusion

This study presented the epidemiological characteristics of patients diagnosed with athletic pubalgia attended to in a reference medical center for athletes and demonstrated the prevalence of this lesion in male patients, soccer players, and runners. It also disclosed a high success rate of non-operative treatment, and high rate of return to sport after treatment.

Conflicts of interest

The authors declare no conflicts of interest.

Annex 1. Protocol: Athletic pubalgia

Name: _____

Age: _____ Sex: _____

Sport: _____ Category: _____

Position: _____ Dominance: Right Left

Frequency of resistance training/week: _____

Time between sport initiation and symptom onset: _____

Time between symptom onset and definitive diagnosis (months): _____

Diagnoses prior to the definitive diagnosis: YES NO

Which: _____

Other orthopedic pathologies: YES NO

Which: _____

Comorbidities: YES NO

Which: _____

Treatment:

Conservative Physiotherapy duration: _____

Number of injections: _____

Surgical: _____

Demanded injury leave YES NO Duration: _____

Return to sport practice: YES NO

At the same level as before the injury: YES NO

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