EPIDEMIOLOGICAL PATTERNS OF ADOLESCENT IDIOPATHIC SCOLIOSIS IN A SPINAL CENTER IN CURITIBA

EPIDEMIOLOGIA DA ESCOLIOSE IDIOPÁTICA DO ADOLESCENTE DE UM CENTRO ESPECIALIZADO EM CURITIBA

EPIDEMIOLOGÍA DE LA ESCOLIOSIS IDIOPÁTICA EN ADOLESCENTES EN UN CENTRO ESPECIALIZADO EN CURITIBA

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ABSTRACT

Objective: Evaluation of the profile of the population with adolescent idiopathic scoliosis (AIS) treated at a center specializing in spine surgery in Curitiba-PR. Methods: Prospective multicenter study, being analyzed, at the moment, only data from the center in question. All patients referred from the basic health service for evaluation of deformity underwent panoramic radiography of the total spine to evaluate the curvature using the Cobb method, evaluation of skeletal maturity using the Risser classification, and the classification of scoliosis using the Lenke classification. Clinical photographs of all patients and an assessment of the quality of life using the SRS-30 questionnaire were also taken. Results: Thirty patients with scoliosis and a mean age of 14.63 ± 3 years were evaluated. Prevalence of female:male 1.5:1. Patients had a mean Cobb of 45.96°, and most were close to Risser 4 skeletal maturity (48.3%). 60% had a thoracic curve (Lenke 1), and 13.3% had a double curve (Lenke 3 or 6). 63.3% of cases had a delay in medical care, taking an average of 18 months between referral and consultation with a specialist. 60% of patients were referred for surgical treatment after the first appointment. Conclusion: The population sample of this center follows the literature. A Cobb >40° in the first consultation with a specialist and a high referral rate to surgery suggest the failure of early diagnosis and the need for public policies for better knowledge and assistance for adolescent idiopathic scoliosis. ***Level of Evidence IV; Descriptive Epidemiological Study.***

Keywords: Scoliosis; Epidemiology; Public Health; Prevalence; Spine.

RESUMO

*Objetivo: Avaliação do perfil da população com escoliose idiopática do adolescente (EIA) atendida no centro especializado em cirurgia de coluna em Curitiba-PR. Métodos: Estudo multicêntrico prospectivo, sendo analisados, no momento, somente os dados do centro em questão. Todos os pacientes encaminhados do serviço de saúde básica para avaliação de deformidade foram submetidos a radiografia panorâmica de coluna total para avaliação da curvatura através do método de Cobb, avaliação da maturidade esquelética pela classificação de Risser e classificação da escoliose por Lenke. Foram, também, realizadas fotos clínicas de todos os pacientes e avaliação da qualidade de vida pelo questionário SRS-30. Resultados: Foram avaliados 30 pacientes com escoliose e idade média de 14,63 ± 3 anos. Prevalência de sexo feminino:masculino 1,5:1. Os pacientes apresentavam Cobb médio 45,96° e a maioria estava próxima da maturidade esquelética Risser 4 (48,3%). 60% apresentavam curva torácica (Lenke 1) e 13,3% dupla curva (Lenke 3 ou 6). 63,3% dos casos apresentaram atraso na assistência médica, demorando em média 18 meses entre o encaminhamento e a consulta com especialista. 60% dos pacientes foram encaminhados para tratamento cirúrgico após a primeira consulta com um especialista. Conclusão: A amostra populacional deste centro encontra-se consoante a literatura. Pelo Cobb >40° na primeira consulta com o especialista e a alta taxa de encaminhamento para cirurgia, fica demonstrado a falha do diagnóstico precoce e necessidade de políticas públicas para melhor conhecimento e assistência da escoliose idiopática do adolescente. **Nível de evidência: IV; Estudo Epidemiológico Descritivo.***

***Descritores:** Escoliose; Epidemiologia; Saúde Pública; Prevalência; Coluna Vertebral.*

RESUMEN

Objetivo: Evaluación del perfil de la población con escoliosis idiopática del adolescente (EIA) tratada en un centro especializado en Curitiba-PR. Métodos: Estudio multicéntrico prospectivo, analizándose, por el momento, únicamente los datos del centro en cuestión. A todos los pacientes derivados del servicio básico de salud para evaluación de deformidad se les realizó radiografía panorámica de columna total para evaluación de la curvatura mediante el método de Cobb, evaluación de la madurez esquelética mediante la clasificación de Risser y clasificación de escoliosis mediante la clasificación de Lenke. También se tomaron fotografías clínicas de todos los pacientes y evaluación de la calidad de vida mediante el cuestionario SRS-30. Resultados: Se evaluaron 30 pacientes con escoliosis y edad media de 14,63 ± 3 años. Prevalencia femenino:masculino 1,5:1. Los pacientes tenían un Cobb medio de 45,96° y la mayoría estaba cerca de la madurez

esquelética Risser 4 (48,3%). El 60% tenía curva torácica (Lenke 1) y el 13,3% tenía doble curva (Lenke 3 o 6). El 63,3% de los casos tuvo retraso en la atención médica, transcurriendo en promedio 18 meses entre la derivación y la consulta con un especialista. El 60% de los pacientes fueron derivados para tratamiento quirúrgico después de la primera cita. Conclusión: La muestra poblacional de este centro está de acuerdo con la literatura. Por Cobb > 40° en la primera consulta con un especialista y una alta tasa de derivación a cirugía, se sugiere el fracaso del diagnóstico precoz y la necesidad de políticas públicas para mejorar el conocimiento y la asistencia de la escoliosis idiopática del adolescente. **Nivel de Evidencia IV; Estudio Epidemiológico Descriptivo.**

Descriptores: Escoliosis; Epidemiología; Salud Pública; Prevalencia; Columna Vertebral.

INTRODUCTION

Adolescent idiopathic scoliosis (AIS) is a three-dimensional deformity characterized by a lateral deviation greater than 10° and vertebral rotation that occurs in healthy children of pre-pubertal age.[1-3] It can be classified as infantile (0 to 3 years old), juvenile (4 to 9 years old), and adolescent (10 to 18 years old).[3-5]

The prevalence of AIS ranges from 1 to 13%, depending on the diagnostic criteria used, ethnicity, and access to the health care system.[1,6-8] Studies estimate that up to 3% of pubescent adolescents will develop some degree of curvature of the spine, with progression to magnitudes that impact the cardiopulmonary system if left untreated.[9,10]

With the studies proving that using the vest prevents the progression of the curve and reduces the need for surgical treatment, there has been a significant increase in interest in school screening, aiming for early diagnosis and treatment, thus ensuring faster access to specialized centers.[4,8-12]

In Brazil, studies on the epidemiology of scoliosis are rare, and no population screening policy exists.[6,13,14] Therefore, the goal of this study is to evaluate the profile of scoliosis patients seen at our referral center and the main barriers encountered in the treatment of scoliosis to in the future create and implement ways to facilitate access to treatment for these adolescents.

METHODS

This multicenter prospective study was conducted in 17 centers specialized in spine surgery in Brazil, authorized by the ethics committee (CAAE 35250220.2.3009.0020). Our center is located in Curitiba, Paraná, and we collected the data between July 2021 and January 2023.

All patients under 18 years of age with adolescent idiopathic scoliosis were included. Those who had already had surgical procedures on the spine and other causes of deformity such as Scheuermann's kyphosis, neuromuscular or congenital scoliosis, isthmic and dysplastic spondylolisthesis were excluded from the study.

All patients underwent panoramic radiography of the total posteroanterior (PA) and lateral spine for deformity measurement using the Cobb method[5] (Figure 1), evaluation of skeletal maturity by Risser's classification[15], and scoliosis classification by Lenke.[5,16] Quality of life was analyzed using the Scoliosis Research Society -30 (SRS-30) questionnaire,[17] and clinical photos were taken (Figure 2) to evaluate shoulder height and symmetry, splint triangle, and the Adams test, according to the Spinal Deformity Study Group manual.[5] Patients with a curve above 40° or documented curve progression were referred for surgical deformity correction.

The patients' guardians followed all the consultation steps and signed the consent forms.

RESULTS

This prospective multicenter study included 420 scoliosis sufferers in Brazil, and we are now presenting data from 30 patients from our specialized center in the city of Curitiba-PR.

The population of this study was made up mostly of girls (60%) post-menarche (88.9%), with a female:male prevalence of 1.5:1. The patients had a mean age of 14.63 ± 3 years. And 83% were white, 6.7% black, and 10% brown.

Ninety percent of the patients came to the specialized center

Figure 1. Measuring the curve by the Cobb method.

Figure 2. A - Clinical photo of the patient; B - Adams test.

by referral after primary care. Of these, approximately 56% received no treatment advice. Of the 30 patients, only seven (23.3%) had a previous orientation to wear a vest and had done so for at least six months. At the current visit, none of them was wearing an orthosis.

A delay in assistance (consultation, treatment, or surgery) was found in 63.3% (19/30) of the patients, mainly due to the delay in entering the specialized center (84.2%); in our case, there was an average of 18 months waiting time between referral and consultation.

The search for assistance, in 80% of the cases, was due to the perception of the deformity by the parents, be it shoulder asymmetry, lateralization of the trunk, or gibbousness. In the SRS-30 questionnaire, 83.2% of the patients complained of constant but not limiting pain, and 10% had occasional pain. In addition, approximately half of the adolescents (51.2%) reported that the deformity bothered them to alter their social relationships with friends and family and affected their self-esteem.

After an initial evaluation, most patients had advanced skeletal maturity Risser 4 (48.3%) and Risser 5 (27.6%), and the mean Cobb of 45.96°. (Table 1)

The vast majority (86.6%) had a single curve, most frequently the thoracic curve (60% Lenke 1), followed by the thoracolumbar/lumbar curve (26.6% Lenke 5), and 13% had a double curve (Lenke 3 or 6).

After specialized consultation, 60% of the patients were referred to surgical treatment, with an average wait of 5 months, and none indicated using a brace.

DISCUSSION

The prevalence of AIS varies by diagnostic method, ethnicity, and global region.[1,14,18-21] Our study aimed to portray the population with adolescent idiopathic scoliosis seen at our specialized center.

In agreement with the published literature,[6-8,22] our population is composed predominantly (60%) of girls, in the age group between 11 and 17 years, with a mean age of 14 years.

Hurriyet et al.[18], in their epidemiological study, found an incidence of AIS in Turkey of 2.3%, with a prevalence of female: male 2.1:1. Yaokreh et al.[23] showed a prevalence of 1.3F:1M, as well as Zhang et al.[22] in his meta-analysis of epidemiological studies from China found a 1.02% incidence of scoliosis in the school population with a sex prevalence of 1.5F:1M. data consistent with our population (1.5F:1M).

The search for care in our population was mainly (80%) due to the perception of the deformity by the parents. Most studies show that when there is no school screening, the diagnosis of scoliosis is made late, usually by the caregivers' perception or the complaint of pain.[9,12,24,25]

Kenner et al.[4] demonstrated that the lack of population screening in Australia generated a mean delay of 20.7 months between detecting the deformity and referral to a specialist, resulting in 78% of the adolescents with curves above 40° at the first clinical evaluation. Yaokreh et al.[23] found a 17.9-month delay for this first evaluation. Al-Arjani et al.[20] showed that most adolescents had curves above 40° at the initial consultation, and only 9% of the population diagnosed with scoliosis received any specific treatment before the specialist evaluation. These data are similar to the present study, which referred 60% of patients for surgical treatment at the first visit due to curvatures >45°.

Back pain, although not limiting daily activities, was one of the main complaints (83.2%) of the patients in this study. Although it

Table 1. Cobb distribution.

	N	%
10 a 19°	2	6,66
20 a 44°	10	33,33
45 a 59	11	36,66
60 a 100°	7	23,33

is considered an asymptomatic pathology, recent studies have increasingly shown that the complaint of back pain is more frequent in scoliosis sufferers when compared to adolescents without scoliosis.[7,13,26,27] Dantas et al.[13] found 63.7% of back pain in their study in Pernambuco. Teles et al.[27] demonstrated that 85.8% of patients have some degree of back pain and proved a statistical association between hypokyphosis and pain, concluding that pain in AIS is related to psychological factors and morphological factors of scoliosis.

Limitations

This study has some limitations, mainly the small number of participants that prevents the generalization of the data extracted here for Curitiba-PR. Another important factor is that the study occurred during the COVID-19 pandemic, directly influencing access to health care for non-emergency pathologies.

CONCLUSION

The prevalence and characteristics of AIS at the center evaluated are under the data in the literature. However, with most of the participants being referred for corrective surgery in the first evaluation, it suggests the failure of early diagnosis and the need to implement public policies to improve access to information and treatment of idiopathic scoliosis.

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