Original Research Article

Evaluating outcomes following assessment of idiopathic scoliosis

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ABSTRACT

Background: Adolescent Idiopathic scoliosis (AIS) is the most common cause of three-dimensional deformities of the spine. To evaluate the prevalence, association between Cobbs angle and some independent variables such as age and sex of orthopedic patients at Babcock University Teaching Hospital, Ogun, South West, Nigeria.
Methods: This was a retrospective epidemiological study of scoliosis patients seen between January 2019 to December 2021 at Babcock University Teaching Hospital, Ogun State. Data were obtained from patients medical records after due permission had been sought for and obtained from the hospital management.
Results: The prevalence of scoliosis among the patients was 2.62% and females have higher rates of scoliosis as compared to the males. We also found out that majority of the patients were older than 18 years of age with a prevalence of 1.33% while the prevalence for early age was 1.29%. The most common Cobbs angle was 10-19°. Lower back pain (55.8%) was the major reason for showing up at the hospital. Out of all treatment options, the most offered was Physiotherapy and medications (48.1%). There was significant association between Cobbs angle and age (p<0.005).
Conclusions: The prevalence of scoliosis among orthopedic patients at Babcock University Teaching Hospital, Ogun state was 2.62 %. Age was associated with Cobb's angle.

Keywords: Idiopathic scoliosis, Prevalence, Ogun

INTRODUCTION

Scoliosis is a lateral curvature of the spine that is deemed pathological when it is >10° using the Cobb's method of measurement and when evaluated on anterior-posterior (AP) thoracolumbar radiographs.[1,2] It is accompanied with rotational changes that can be viewed on lateral thoracolumbar radiographs of the spine and is often related with back pain on the side of the convexity, as well as noticeable trunk, back, and waist asymmetry.[3-]

Scoliosis is frequently undiagnosed until evident symptoms appear, and these symptoms can lead to more serious complications.[6,7] Early detection and therapy, on the other hand, can avoid the development of a significant

deformity that may require costly surgical correction.[8] Failure to seek medical help may result in the deformity progressing, affecting quality of life, and causing major pulmonary issues.[6,9,10] In most situations, the etiology of scoliosis cannot be determined, hence these cases are referred to as "idiopathic," and they account for 70-80% of all cases.[11,12] Neuromuscular illnesses (such as cerebral palsy or muscular dystrophy), osteopathic or bone ailments, or postural faults can all cause scoliosis. There are two types of causes: structural and non-structural. Some genetic abnormalities have been associated to structural scoliosis.[13,14] Scoliosis can start at any age, thus it's divided into four categories: infantile (0-3 years), juvenile (4-10 years), adolescent (11-18 years), and adult scoliosis (>18 years).[11,15,16]

In other regions of Nigeria, research found prevalence rates ranging from 1.2 to 5.3 percent, with females being more affected than males.[15,16] Physical examination of the back, which combines upright physical examination of the back and the Adams forward bending test are the most used screening test for scoliosis. [17] Standing roentgenograms, inclinometers, and Moire topography are further screening approaches.[17] Physical examination, on the other hand, has been acknowledged by orthopedic surgeons for finding spine abnormalities during school-aged kid screening.[18]

The objective of the present study was to determine the current prevalence of scoliosis and therapy offered to the orthopedic patients Babcock University Teaching Hospital, Ogun (BUTH), Nigeria. The association between Cobb's angle and some independent variables such as age and sex was also determined.

METHODS

Study design

This was a retrospective 3-year epidemiological study covering January 2019 to December 2021 at Babcock University Teaching Hospital, Ogun State. Information/data were obtained from hospital case notes after due permission had been sought for and obtained from the hospital management. For the purpose of this study, we selected case files of patients who had Cobbs angles measured.

Study population

The number of orthopedic patients seen at Babcock University Teaching Hospital, Ogun (BUTH) between 2019 to 2021 formed the study population. A total number of 2937 patients seen and treated within the period were analyzed.

These patients had low back pain, lateral curvature of the upper back as major complains. We excluded patients with back problems such as disc herniation, fractured vertebrae or any neurologic condition that may result to scoliosis.

Statistical analysis

Descriptive statistics of frequency distribution, mean, standard deviation and percentages were used for this analysis. Chi-square was used to determine the relationships between age, gender and the measured degree of curvature.

RESULTS

A total of 77 cases of orthopedic patients with a prevalence of 2.62% were diagnosed with idiopathic scoliosis during this period (Table 1).

Table 1: Yearly prevalence of scoliosis among orthopedic unit out-patients at Babcock University Teaching Hospital, Ogun.

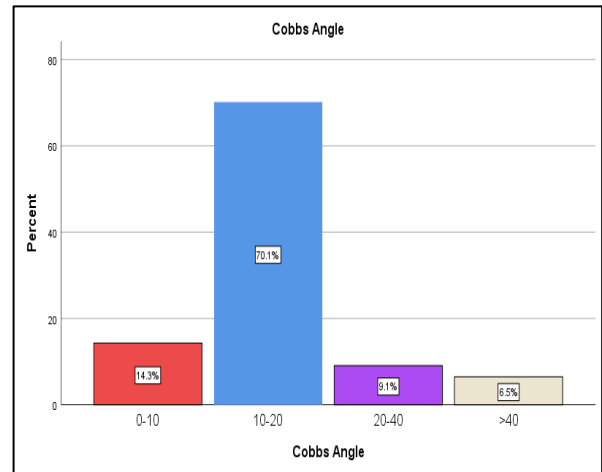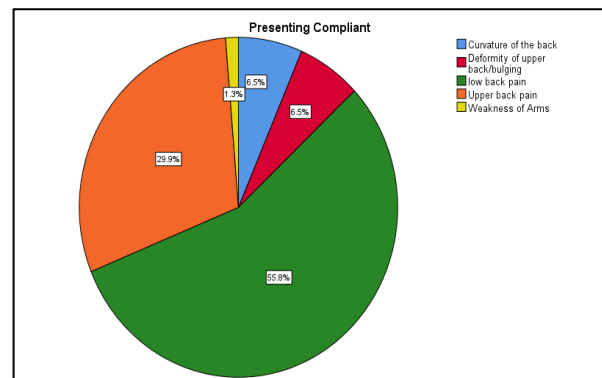| Year	Total no of patients	No with scoliosis	Prevalence
2019	650	19	
2020	859	26	2.62
2021	1428	32	
Total	2937	77	

Figure 1: Cobbs angle.

Figure 2: Presenting complaints.

Depicted in Table 2 is the age of the patients, 67.5% were between 15-30 years of age, 22.1% were less than 15 years of age while 10.4% were above 31 years. Figure 1 revealed that, only 14.3% of the patients had normal spinal curve (0-10°), 70.1% had mild scoliosis (10-20°), 9.1% had moderate scoliosis (20-40°) and 6.5% had severe scoliosis (>40°). Majority of the patients (84.4%) had a riser score of 5 as shown in Table 2. Also from Figure 2, 55.8% came in with complains of the lower back, 29.9% had upper back pain, 6.5% each had curvature of the back and deformity/bulging of the upper back while only 1.3% had weakness of the arms. The most common therapy offered to these patients were;

medications and physiotherapy (48.1%), medications and pilates (18.2%). Other therapies were Boston braces muscle relaxants and surgery (Table 2). About 5 (6.5%)

patients who presented with severe scoliosis were counseled for surgery.

Table 2: Socio-demographic and spinal characteristics of patients.

Variables		Cobbs Angle					
		0-10 (Normal)	10-20 (Mild)	20-40 (Moderate)	>40 (Severe)	Total (n=77)	P value
Age in years	<18	2 (2.6)	27 (35.1)	4 (5.2)	5 (6.5)	38 (49.4)	0.022
	>18	9 (11.7)	27 (35.1)	3 (3.9)	0 (0.0)	39 (50.6)	
Gender	Female	8 (10.4)	42 (54.5)	6 (7.8)	2 (2.6)	58 (75.3)	0.264
	Male	3 (3.9)	12 (15.6)	1 (1.3)	3 (3.9)	19 (24.7)	
Riser sign	3	0 (0.0)	3 (3.9)	0 (0.0)	0 (0.0)	3 (3.9)	
	4	1 (1.3)	4 (5.2)	2 (2.6)	2 (2.6)	9 (11.7)	0.244
	5	10 (13.0)	47 (61.0)	5 (6.5)	3 (3.9)	65 (84.4)	
Presenting complaints	Curvature of the mid back	0 (0.0)	2 (2.6)	2 (2.6)	1 (1.3)	5 (6.5)	-
	Deformity/bulging of the upper back	0 (0.0)	0 (0.0)	1 (1.3)	4 (5.2)	5 (6.5)	
	Low back pain	7 (9.1)	34 (44.2)	2 (2.6)	0 (0)	43 (55.8)	
	Upper back pain	4 (17.4)	17 (73.9)	2 (8.7)	0 (0.0)	23 (100.0)	
Therapy	Pain relievers	4 (5.2)	6 (7.8)	0 (0.0)	0 (0.0)	10 (13.0)	-
	Pain relievers +PT	6 (7.8)	30 (39.0)	1 (1.3)	0 (0.0)	37 (48.1)	
	Pain relievers + Pilates	0 (0.0)	12 (15.6)	2 (2.6)	0 (0.0)	14 (18.2)	
	Pain relievers + PT+ Counseled for surgery	0 (0.0)	0 (0.0)	0 (0.0)	5 (6.5)	5 (6.5)	
	Pain relievers + Muscle relaxants	0 (0.0)	3 (3.9)	1 (1.3)	0 (0.0)	4 (5.2)	
	Boston brace + Pain relievers + Muscle relaxants	1 (1.3)	3 (3.9)	3 (3.9)	0 (0.0)	7 (9.1)	

DISCUSSION

Idiopathic scoliosis has no known cause and is characterized as a lateral and rotational curvature of the spine measuring at least 10 degrees as measured by the Cobb technique. Its global prevalence ranges from 1% to 13%.[19,20] This study reported the prevalence of scoliosis to be 2.62% and females appear to have higher rates of scoliosis than males. Females were more affected than men in certain studies conducted in different regions of Nigeria, with prevalence rates ranging from 1.2 to 5.3 percent.[15,16] Higher prevalence rates were discovered in other sites, and racial characteristics were utilized to explain the disparity in prevalence rates.[21,22]

The findings of the present study indicate that small scoliotic curves (10 to 20°) are the most common (35.1%). In collaboration, studies from Korea, Tokyo and India also reported higher prevalence for small scoliotic curves (70.1%).[23-25] The most common complains made by the patients were, lower back pain (55.8%) and upper back pain (29.9%). Some literatures also revealed similar findings with lower back pain as the major complain of patients with scoliosis.[26-29]

The indications for treatment rely largely on the Cobb's angle. Various treatments were offered for the patients in this study, the most common were (Medications and Physiotherapy: 48.1%, Medications and Pilates: 18.2%) for 10-20°. Medications such as Non-steroidal Anti-inflammatory drugs (NSAIDs) were prescribed to majority of the patients to relieve their pain, scoliotic pain is as a result of pressure spinal disks and facet joints, causing them to be inflamed. According to literature, the major treatment approaches for patients with Scoliosis include physiotherapy.[30-32] In Europe, the International Scientific Society on Scoliosis Orthopedic and Rehabilitation Treatment has recommended that Physiotherapeutic scoliosis-specific exercises (PSSE) should be the first step in treating idiopathic scoliosis to prevent/ limit the progression of the deformity.[32] Kim and Hwang subjected idiopathic scoliosis patients to PSSE treatments three times a week for 12 weeks and found a reduction in thoracic Cobb's angle of approximately 49%, from the 23.6° to 12°.[33] They also reported a reduction in trunk rotation angle of approximately 58%, from 11.86° to 4.9° and an increase in the breathing volume of about 42%, from 2.83 to 4.04 in another study.[34] Surgery was considered for patients with scoliotic curves >40°.

In relationship to this, Maruyama and Takeshita reported that surgery should be indicated for scoliotic curves exceeding 40 or 50° by the Cobb's angle. This study also discovered there was significant association between CA and age (p<0.005). In collaboration, reports from Singapore and Tokyo reported significant association between Cobs angle and age among patients.[35,36]

Limitations of the study

This research was not without flaws. 45 confirmed scoliosis cases were excluded due to incomplete records, resulting in a complete loss rate of 36.9%.

CONCLUSION

Scoliosis was reported to be 2.62% frequent among orthopedic patients at Babcock University Teaching Hospital in Ogun state. This study also revealed that Cobb's angle was highly dependent on age. To enhance scoliosis referral timeliness, better distribution of criteria for scoliosis referrals is advised. In Ogun state, the reintroduction of adult scoliosis screening may be recommended in order to discover idiopathic scoliosis sooner than we do now. These findings suggest that epidemiological regional diversity, presumably with a genetic foundation, should be taken into account. All of the features we discovered might help the local government develop health strategies. They may be able to assist in the early development of a rehabilitation program for these patients, as well as enhance their spinal health.

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