

A REVIEW ON UNDERSTANDING OF SCOLIOSIS AND ITS AYURVEDIC ASPECTS

Fathima P. V.¹, George M. J.²

¹Post Graduate Scholar, ²Professor and HOD,
Department of Shalyatantra, Vaidyaratnam P. S. Varier Ayurveda College, Kottakkal, Kerala, India

Corresponding Author: pvfathima90@gmail.com

<https://doi.org/10.46607/iamj1209122021>

(Published Online: December 2021)

Open Access

© International Ayurvedic Medical Journal, India

Article Received: 02/11/2021 - Peer Reviewed: 27/11/2021 - Accepted for Publication 02/12/2021



ABSTRACT

The spinal curvatures are important for balancing the body and it help us to stand upright. If any one of the curves become too large or small, our posture may appear abnormal. There are three main types of spinal curvature disorders, viz: scoliosis, kyphosis and lordosis. Among these, scoliosis is the common one. Scoliosis is a lateral curvature of the spine that occurs most often during the growth spurt just before puberty. In 80% of scoliosis patients, the cause is unknown. In most of the cases the curve is mild, but in some children the curve continues to worsen as the child grows. Children who have mild scoliosis need to be monitored closely. In such cases, no treatment is usually necessary. Some of them will need to wear a brace. The ultimate treatment for a progressive curve in children is surgery. While going through Ayurveda literature, we see the word *Kubja*, and is a common term used by Acharyas to describe a hump like appearance. This article is intended to review scoliosis, its classification, symptoms, diagnosis and treatment and its Ayurvedic aspects.

Keywords: Scoliosis, Brace, *Kubja*

INTRODUCTION

The spine consists of an elegant stack of vertebrae and discs, which appear straight from the front and curved from the side, to keep the body erect and the head level. When abnormalities of spine occur, the natural

curvature of the spine are misaligned or exaggerated in certain areas. Spinal deformities can occur for a wide range of reasons, including birth defects, aging and degeneration, to trauma. All spinal deformities involve

problems of the curve or rotation of the spine. Common adult spinal deformities are scoliosis, kyphosis, and lordosis. Among these three, scoliosis is the common spinal column deformity. It produces body disfigurement. When deformity is extreme, the curve displaces and compresses the viscera, compromises their function, and reducing life expectancy.

The term scoliosis is derived from the Greek word *skolios* which means crooked. As per the definition of scoliosis research society, scoliosis is the lateral curvature of the spine >10 degree as measured using the Cobb's method on a standing radiograph. Scoliosis affects 2-3% of the total population. The primary age of onset for scoliosis is 10-15 years old. Females are eight times more likely to progress to a curve, that requires treatment. In Ayurveda scoliosis is not described as a specific or separate disease and there is no specific term which can be directly correlated to scoliosis. While going through the Ayurveda literature, we see the word *Kubja*. It is a common term used by Acharya to describe a hump like appearance, which may be scoliosis, kyphosis or kyphoscoliosis. When scoliotic curve become severe, it tends to give a humped back like appearance. So, scoliosis can be included under the umbrella term *Kubja*. The word *Kubja* and *Koubjya* are used as synonymous, and both the terms are seen in our literature. According to *Acharya Susrutha* there are many *Nidanas*(causes) for *Kubjata* which include, *Douhridavimanaja* (longings of a pregnant women), and *Vatakopa* (vitiation of *vata*) during pregnancy¹. *Koubjya* is one among the *Ashèthi Vatavikara* and is included under *Vataprakopalaksana* by

*Acharya Caraka*². *Acharya Vagbhata* considers *Kubja* as one among the *Garbajavyadi*.

Classification

Scoliosis is classified mainly in to two. They are non-structural and structural scoliosis. Nonstructural scoliosis is a curve in the spine, without rotation, that is reversible because it is caused by a condition such as: pain or a muscle spasm or leg length discrepancy. In this type of scoliosis, the spine is normal, but an abnormal curve develops because of a problem somewhere else in the body. Non-structural curves are not fixed but flexible and readily corrected with forward bending.

Structural curves are fixed, non-flexible and fail to correct with bending. It can be caused by birth defects (such as hemivertebra, in which one side of a vertebra fails to form normally before birth). It may occur as result of injury, certain infections, tumors (such as those caused by neurofibromatosis, a birth defect sometimes associated with benign tumors on the spinal column), metabolic diseases, connective tissue disorders, rheumatic diseases. In other cases, it happens by itself or by unknown factors (idiopathic scoliosis). Structural scoliosis can also be caused by neuromuscular diseases³.

Idiopathic scoliosis

Idiopathic is the most common type of structural scoliosis, and accounts for about 70% of all cases⁴. It has a genetic predisposition, and although many etiological theories have been proposed, the cause still remain unknown. It may appear at any one of three well defined periods of growth.

Types of idiopathic scoliosis	Age	Features
Infantile	<3 years	Because of the early onset of curvature and its effect on pulmonary parenchyma development, patients with untreated, infantile, early onset scoliosis may develop severe restrictive pulmonary disease, and early death.
Juvenile	3 - 10 years	It accounts for about 20% of all idiopathic scoliosis. This occurs more commonly in girls, with right thoracic curve.
Adolescent	>10 years	Curve presenting at or about the onset of puberty, and before maturity, and it accounts for about 80% of all cases of idiopathic scoliosis.

A history of rapid progression of an adolescent curve should alert the physician to consider neurologic consultation, because of high association of intraspinal

pathology. Double curve pattern has a greater tendency for progression than single curve pattern and curves detected before menarche have a much greater

chance of progression than those detected after menarche⁵. The risk of curve progression decreases with increasing skeletal maturity. The deformity of scoliosis may be associated with psychosocial concerns. Some adults with moderate to severe deformity may have



Adolescent idiopathic scoliosis

several psychosocial problems. Only a progressing thoracic curve causes cardiopulmonary symptoms. 80% of scoliosis in infants will resolve without treatment. Those that do not resolve can be difficult to manage.



Juvenile idiopathic scoliosis

Congenital scoliosis

Congenital scoliosis is due to the abnormalities of vertebral development. This may be due to failure of formation as in hemivertebrae or failure of segmentation in unilateral unsegmented bar or combinations of, defects of segmentation and formation. Many congenital spinal deformities are discovered only accidentally on radiographs, and some are associated with severe deformities noted at birth.

Neuromuscular scoliosis

Neuromuscular scoliosis is an irregular spinal curvature caused by disorders of the brain, spinal cord and muscular system. This type of scoliosis generally progresses more rapidly than idiopathic scoliosis. It includes scoliosis associated with cerebral palsy, muscular dystrophy, and spina bifida. Scoliosis in cerebral palsy is frequent, it presents most often as a thoracolumbar curve.

Others

Scoliosis is the most common skeletal lesion in patients with neurofibromatosis and constitutes approximately 1% of all types of scoliosis. The other categories include scoliosis due to mesenchymal disorders, trauma and due to metabolic, nutritional and endocrine abnormalities.

We usually see many cases of scoliosis in our day-to-day practice. In these, even though the symptoms are same, the underlying pathology will be different. By observing these, it is possible to classify *Kubja* under the four headings as *Sahaja*, *Dhatu kshayajanya*, as *Madyamarogamargavyadi* and as *Upadravavyadi*.

Sahaja

Scoliosis by birth can be included under *Sahaja* type. There are references in our literature, regarding the foetal abnormalities. According to *Acharya Susrutha*, the *Vatakopa* during pregnancy makes the fetus to be born as *Kubja*. And *Acharya* also explains that inauspicious activities of the parents result in *Vatakopa*, and it will lead to *Garba vikriti*⁶. Ayurveda explains *Garbhiniparicharana* (regimen of pregnant lady) to be followed in detail, and non-observance of this may be a cause for such deformities. The functions of *Praakrita* and *Vaikrutavaata* during *Garbhavastha* also play an important role in *Garbhavikriti* (abnormal foetus). And it was quoted by *Charaka*, that *Praakrithavata* forms the shape of the embryo and in *Vikritaavastha* it destroys and deforms the embryo⁷. Vitiating of *Vata* during *Garbhavastha* may also be a reason for the formation of *Asthivikrities* like hemivertebra and unsegmented bar. And a family history

of scoliosis also can form a strong *Nidana* in *Sahaja* type.

Dathukshayajanya

The next type is *Dathukshayajanya* type. It is again divided in to *Kubjatha* due to *Datwagnivaishamy* (fire at the level of tissue) and due to *Asthikshaya*. In Ayurveda *agni* has a significant role in metabolism and proper functioning of body. *Vishamavastha* (derangement) of *Agni* at *Dathu* level may lead to improper *Dathuparinama* which will lead to *Dathujanyavikara*. Modern literature also supports this as in case, calcium deficiency, Vit. D deficiency etc. Nutritional studies indicated that adolescent idiopathic scoliosis patients had low dietary calcium intake. Evidence also suggests that vit D insufficiency could be present in idiopathic scoliosis. In *Dathujanyavikara* due to *Datwagnivaishamy*, there is defective formation of *Dathu*. Even though there is no defect in the formation of *Dathu*, the formed *Dathu* undergoes degeneration in *Asthikshaya* type.

As Madyamarogamargavyadhi

The third classification is, *Kubjatha* due to defects in *Madyamarogamarga*. Vertebral column is a joint complex, and its stability is maintained by adjacent muscles and ligaments. Even though the vertebrae are intact, weakness of these supporting structures also lead to scoliosis. The *Mamsadidathu* which included under *Madyamarogamarga*, especially the *Sira Snayu* and *Kandara* are the supporting structures of vertebral column. So Scoliosis due to any defect in these supporting structures may be included under *Madyamarogamarga*. Also, *Kubjatha* is one among the *Snayugatavikara* which is mentioned in our literature⁸.

As an Upadravavyadhi

Scoliosis is seen as secondary to diseases like *Gridrasi*, and *Khanjatha*. In this, *Gridrasi* and *Kanjada* are primary diseases, and scoliosis is secondary. Here treatment given to the primary disease, also cures the secondary one. This type of scoliosis can be included under *Upadravavyadi*.

Clinical features

Deformity is usually the presenting symptom⁹. The clinical features include prominent shoulder blade, uneven shoulders, asymmetry of waist, rib hump and

unequal hip level. As the vertebral bodies rotate, the spinous processes deviate more and more to the concave side and the ribs follow the rotation of the vertebrae. The posterior ribs on the convex side are pushed posteriorly, causing the characteristic rib hump seen in thoracic scoliosis. Thorax shifted to same side of curvature, so the arm thorax distance decreased.

Diagnosis and Examinations

In order to analyze the deformity, it is necessary to compile certain essential information in each case. History of the patient particularly includes the age at recognition of deformity, rate of progression and associated symptoms like pain, fatigue and cardio-pulmonary symptoms. The following examinations are also conducted to confirm diagnosis.

Plumb line test- First one is Trunk alignment, with the patient standing, the trunk is inspected from the posterior aspect. To know the trunk alignment, we can do plumb line test. This is a quick visual check to see whether spine is straight or not.

Degree of rotation of vertebrae¹⁰-Rotation of the vertebra can be appreciated by looking at the position of the spinous processes. Normally a spinous process is at the center of the vertebral body. In case where there is a rotation of vertebra the spinous process is shifted to one side from the midline.

Reisser's sign¹¹- is an indirect measure of skeletal maturity, whereby the degree of ossification of the iliac apophysis, by x-ray evaluation, is used to judge over all skeletal development.

The Adams forward bend test - is a simple screening that can effectively detect the spinal deformity. To do this, the patient stands up straight, with arms flat at their sides. Then the patient should bend forward at 90° with their arms hanging down, as if they are trying to touch their toes.

Adams forward bend test



Role of x ray in diagnosis – cobb’s method

In scoliosis, x-rays remain the gold standard for diagnosing, assessing, and monitoring. It detects how

much a scoliotic spine deviates from a straight alignment via a measurement known as ‘Cobb’s angle’. When it comes to a progressive spinal condition like scoliosis, in addition to diagnosing and assessing it, monitoring the spine throughout treatment, is possible through x-rays.

Cobb’s method is the most commonly used method for measuring the curve¹². To measure the Cobb’s angle, a horizontal line is drawn at the superior border of the superior end vertebrae. Another horizontal line is drawn at the inferior border of the inferior end vertebrae. Perpendicular lines are then erected from each of the horizontal lines and the angles formed by the intersecting lines are measured.



Management

Each curve should be closely observed until halt in progression can be established. If possible, treatment should be initiated early while the curves are minimal and flexible. Treatment is mainly divided into conservative and surgical. Conservative management includes observation and monitoring, use of brace, traction and exercises. If surgical correction and fusion are indicated, they should be postponed as long as possible.

Conservative management

When Cobb’s angle is between 10 – 25°, it is considered as mild scoliosis, in this stage observation alone is recommended. If the Cobb’s angle is between 25-40°, which is a moderate curve, at this stage patients are recommended to wear a brace. Studies show that 72% success rate in stopping curve progression by the usage

of brace. It doesn’t work after bone growth has stopped. Wearing a brace won’t cure scoliosis, or reverse the curve, but it usually prevents further progression of the curve.

Exercises play an important role in the treatment. It helps to strengthen the back muscles those support the spine and to increase flexibility, so the spine becomes more moveable. The correct scoliosis exercises depend on the location of the curve. People with lumbar scoliosis should focus on exercising the lower back, while those with thoracic scoliosis need to exercise the shoulder. Use of braces are contra indicated, when there is a cardiopulmonary insufficiency. In such cases, halo gravity traction is the choice. Halo-gravity traction is a way to stretch the spine slowly into a straighter position. It reduces the risk of damaging the

nerves or soft tissue those support the spine during surgery.

Surgical management

Despite of conservative management, curve still progresses, surgery is indicated. Once the scoliotic curve exceeds 40°, it continues to worsen throughout the life, in such cases surgery is considered. The other indications for surgery include a progressive curve, decreasing cardiopulmonary functions, pain and a hereditary history of severe scoliosis¹³. The goals of surgery are to stop curve progression, reduce the deformity and maintain trunk balance. the commonest surgical method in scoliosis is posterior spinal fusion with instrumentation. It is a major surgery and associated with a lot of complications including loss of normal function of spine, pain, infection, impaired psychological health, neurological damage, and allergic reaction to metal rods. In order to overcome the complications of spinal fusion, a new alternative method is adopted, called anterior vertebral body tethering or VBT. Because of there is no fusion of vertebrae in VBT, more mobility of the spine is maintained after surgery.

Ayurvedic line of management

The main aim of Ayurvedic treatment is to halt the progression of the curve, to strengthen the supporting structures and to increase the flexibility of spine. Even though *Sahaja Vyadies* are said to be *Asadya*, we can give supportive treatment in this case. Scoliosis due to *Sahaja* and that due to defects in *Madyama Rogamarga*, we can adopt *Vatavyadi Chikitsa*. By doing this, we may improve the quality of life and prevent the progression of the curve. We can do *Udwartana*, *Pizhinjuthadaval*, *Shashtika Pinda Sweda* and *Vasti* like procedures in scoliosis. *Udwartana* is given as *Srotoshodana* and also it is *Deepana* and *Pacana* at *Sukshma Dhatu* level. *Pizhinjuthadaval* is *Snehana* and *Swedana* at the same time. It is said that by the application of *Snehana* and *Swedana* even a curve or stiff limb can be slowly brought back to normalcy¹⁴. *Snehana* also has the property of *Dhatu Poshana*¹⁵. The main aim of *Shashtika Pinda Sweda* is to strengthen the supporting structures. *Vasti* with *Vataharadravya* also gives better results.

In *Asthikshayajanya* type, during treatment give importance to *Asthivridhi* along with *Vatavyadi Chikitsa*. The concept of *dhatu* aimed treatment is unique to Ayurveda. Here, we can give treatment directly to the *Asthi Dhatu*, also we can treat *Medo Dhatu*, as an improper *Sara* formation from *Medho Dhatu* leads to improper *Asthi* formation. *Dathuagnideepthi*, *Srotoshodana* and *Dathuposhana* are the main stay treatment in *Dathukshayajanya* type. Scoliosis sometimes appears as an *Upadravyadi*, in such conditions with the correction of the primary diseases, scoliosis also gets cured.

CONCLUSION

Scoliosis is a sideways curvature of the spine that most often diagnosed accidentally. The main treatment for scoliosis is surgery and the option for surgery may be considered as a last resort. But surgery is the only option when there is rapid progression of the curve. Only about 10% of scoliosis is progressive and surgery is restricted to such patients alone. Rest of them need conservative management. A mild to moderate scoliosis can be treated with conservative management. Through this we can provide a better quality of life by functional improvement and that may be achieved through Ayurveda. The main aim of Ayurvedic treatment is to halt the progression of the curve, to strengthen the supporting structures and to increase the flexibility of spine.

REFERENCES

1. Srikanthamurthy K.R. Illustrated Suśrutha Samhita: Vol 1. Varanasi: Chaukhambhaorientalia; 2012. p 31.
2. Sharma Bhagwan Dash R. K. Caraka Samhitha, text with english translation and critical exposition based on Cakrapani Datta's Ayurveda Dipika: Vol 1. Varanasi: Chaukhambha Orientalia; 2012. P 363.
3. Samuel L. Turek. Principles of Orthopedics, vol 2. Wolters Kluwer; 1984. page no 1601.
4. Samuel L. Turek. Principles of Orthopedics, vol 2. Wolters Kluwer; 1984. page no 1601.
5. Stuart L. Wienstein, Joseph A. Buckwalter – Orthopaedics principles and their application. 6thEdition, 2005, page 489.

6. Srikantha murthy K.R. Illustrated Suśrutha Samhita: Vol 1. Varanasi: Chaukhambha orientalia; 2012. p 31.
7. Sharma Bhagwan Dash R. K. Caraka Samhitha, text with english translation and critical exposition based on Cakrapani Datta's Ayurveda Dipika: Vol I. Varanasi: Chaukhambha Orientalia; 2012. P 237.
8. Govindan Vaidyan P. M. Cheppatt Achyutha Varier: Ashtanga Hridaya Nidanasthana: Devi book kodungalur, 15th Reprint January 2013.p.273.
9. Maheshwari, Mhaskar. Essential Orthopaedics. Jaypee brothers' medical publishers; 6th edition: 2019.p 281.
10. Maheshwari, Mhaskar. Essential Orthopaedics. Jaypee brothers' medical publishers; 6th edition: 2019.p 281.
11. Maheshwari, Mhaskar. Essential Orthopaedics. Jaypee brothers' medical publishers; 6th edition: 2019.p 282.
12. Samuel L. Turek. Principles of Orthopaedics, vol 2. Wolters Kluwer; 1984. page no 1610.
13. Samuel L. Turek. Principles of Orthopaedics, vol 2. Wolters Kluwer; 1984. page no 1617.
14. Sharma Bhagwan Dash R. K. CarakaSamhitha, text with english translation and critical exposition based on Cakrapani Datta's Ayurveda Dipika: Vol I. Varanasi: Chaukhambha Orientalia; 2012. P 268.
15. Govindan Vaidyan P. M. CheppattAchyutha Varier: Ashtanga HridayaChikitsasthana: Devi book kodungalur, 15th Reprint January 2013.p 584.

Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: Fathima P. V. & George M. J: A Review On Understanding Of Scoliosis And Its Ayurvedic Aspects. International Ayurvedic Medical Journal {online} 2021 {cited December 2021} Available from: http://www.iamj.in/posts/images/upload/2999_3005.pdf