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## ROLE OF SELECTED YOGA PRACTICES IN THE TREATMENT OF ANKYLOSING SPONDYLITIS: A CASE STUDY

Satyendra Kumar Singh<sup>1</sup>, Dinesh Kumar Sharma<sup>2</sup>, Ishwar N Acharya<sup>3</sup>, \*Guru Deo<sup>4</sup>

<sup>1</sup>Yoga Therapist, Morarji Desai National Institute of Yoga, New Delhi-110001. India

<sup>2</sup>Ex Ayurveda Consultant, Morarji Desai National Institute of Yoga, New Delhi-110001. India

<sup>3</sup>Program Officer (Yoga Therapy), Morarji Desai National Institute of Yoga, 68, Ashok Road,  
New Delhi-110001

<sup>4</sup>\*Assistant Professor (Yoga Therapy), Department of Yoga Therapy, Morarji Desai National  
Institute of Yoga, New Delhi-110001. India.

\*Corresponding Author's Email: [gurudeoyoga15@gmail.com](mailto:gurudeoyoga15@gmail.com)

### Abstract:

Ankylosing Spondylitis (AS) is an inflammatory disease of spine which restrict the normal movement, affect peripheral joints and diminishes chest expansion. In AS the spine has less flexibility, stiffed and can result in a hunched-forward posture. If ribs are affected, it is often difficult to breathe deeply and comfortably. In the current case study, an 18 years aged boy had severe pain in his lower back radiating to the legs, gradual reduction in joint movements, stiffening of spine particularly in the morning and feeling weakness since one year. The Yoga protocol designed for the patient had been practiced regularly for three weeks. The pre and post assessment with x-ray and biochemical tests had been done which showed that patient has got improvement in his joint movements, reduced pain and good quality of sleep. The yoga intervention, which consists of specified yogic sukshma vyayama, selected yogasana and pranayama with modified diet and life style were found to be very effective. These practices had very positive effect in enhancing spinal mobility and bringing the value of his C- reactive protein (CRP) in normal range. The x-ray also exhibited the improvement which was done before and after yoga practices. It shows that straitening of lumber spine was

less than earlier which also gave less muscle spasm feeling in patients. The subjective improvement reporting of patient was also very positive where he felt reduced pain, comfort in the movement of spine.

This case report shows that if yoga practices are practiced regularly and properly with predesigned protocol, it will induce very positive effect on psychology of patients with ankylosing spondylitis and also traction in the spine. Such effect need to be studied on the larger scale instead of single case study with robust research design of yoga protocol for spinal disorders like ankylosing spondylitis.

**Key words:** Yoga, Spinal Disorder, Ankylosing Spondylitis, Arthritis

## Introduction

Ankylosing spondylitis (AS) is one of the disorder in which there is a chronic and systemic, inflammation in the spine with no clear cause of effecting the day to day activities of the person.<sup>[1]</sup> In the prototype of seronegative spondarthritis group, it is a chronic inflammatory arthritis with a predilection for the sacroiliac joints and spine. It is characterized by progressive stiffening and fusion of axial skeleton. This disease has a peak onset in the second and third decades, with a male: female ratio of about 3:1. The onset is usually insidious, over months or years with recurring episodes of low back pain and marked stiffness, symptoms extends over many segments and are axial and symmetrical in distribution. Symptoms are marked in early morning and after the inactivity and are relieved by movements. The disease tends to ascend the spine slowly and eventually, after several years the whole spine may be affected. As the spine becomes progressively ankylosed, spinal rigidity and secondary osteoporosis predispose in spinal fracture, presenting as acute, severe, well-localized pain. Extra spinal features are usually asymmetrical at first and may cause inflammatory symptoms mainly affecting hip, knees, ankles, shoulder.<sup>[2]</sup>

## Case Report

An 18 years old boy came with chief complaint of severe pain in pelvic region which was radiating to thighs and calf of both legs since four months. He also complained of indigestion, insomnia and weakness. Patient had been taking symptomatic treatment and was HLA BS- 27 Positive with CRP value 11.39 mg/ L and ESR 49 as shown in his previous

investigations done on 03-03-2021. There was no history of any infection in the body or external injury to the spine. He presented all test and x-ray done previously before starting yoga practices so that comparison of pre and post could be seen. Patient was not having any family history of infection, metabolic diseases or auto immune group of disorders. He also has no addictions such as tobacco, alcohol or cigarette. Patient had consulted doctors in the Open Patient Department (OPD) of Morarji Desai National Institute of Yoga (MDNIY) on 09<sup>th</sup> March 2021 and started his individual yoga therapy sessions from the same day for three weeks. He was also suggested by the therapist to take care of spinal problem while performing the day to day activities in the home. He was clearly told to take precautions while bending forward. Therapist in OPD took all the personal yoga session during the entire intervention of prepared yoga module. He was instructed to practice at home if not coming to practice under supervision in OPD due to unavoidable situation or on holiday.

### Timeline

Patient had followed complete guidelines during whole course of yoga therapy sessions, from the first day itself. He was treated with 3 weeks predesigned yoga protocol at MDNIY. He was instructed to continue the same at home and update condition through phone on weekly basis whenever there was holiday. In the beginning of the class, he was given very simple practices which he could practice easily without any difficulty. The details of all practices are given in the following tables.

The timeline of the yoga protocol is given below in **Table 1**.

**Table 1**

S. No.	Week	Time Period	Yoga Therapy Introduced
1.	First	09-03-2021 to 15-03-2021	Focused on selective Yogic Sukshma Vyayama, stretching & Breath with Awareness
2.	Second	16-03-2021 to 22-03-2021	Sense of awareness on Specific Asanas and Pranayama with more holding time
3.	Third	23-03-2021 to 29-03-2021	OM Chanting was focused with awareness on throat

## Yogic Management

An Individual Yoga Protocol of 60 minutes duration was designed for patient with the following practice under the supervision of Therapist and Physician is as follows:

**Table 2: Daily Yoga Protocol for Ankylosing Spondylitis (60 minutes)**

S. No.	PRACTICE TITLE	PRACTICE NAME	TIME PERIOD / REPETITION
1	Purificatory Processes	Kapalabhati	Daily 10 min (5 rounds x 50 stokes each)
2	Sukshma Vyayama	UccharanSthaltathaVishudhi Chakra kiShudhi BuddhitathaDhriti Shakti Vikasaka Medha Shakti Vikasaka VakshasthalaVikasak – 1 & 2 Griva Shaktivikasaka - 1,2 & 3	Daily (15 min) (2 times each with awareness on breathing)
3	Asanas	Tadasana Konasana Katichakrasana EkpadaShalbhasana SaralBhujangasana Marjariasana EkpadaPawanmuktasana Makarasana	Daily (15 min) (2 times each with awareness on breathing)
4	Pranayama	AnulomaViloma Bhramari	Daily (5 min) 10 cycles Daily (5 min) 20 Times
5	Meditation & Relaxation	OM Chanting – “AA” , “OO” and “MAAA”	Daily (10 min) 15 times, followed by Relaxation

### **Dietary & Life Style Modifications followed from day One itself**

1. Drinking warm water empty stomach soon after getting up the bed, clear bowel is important for Yoga practice.
2. Avoiding water intake while having food and soon after food.
3. Drinking warm water after one hour of every meals to improve digestion.
4. Avoiding all cold food/eatables like ice creams, curd, cold water etc.
5. Take always light diet especially at night.

### **Follow up and outcomes:**

- Patient visited Yoga OPD in MDNIYdaily for three weeks for the regular classes and follow ups.
- He had been regularly updating his status through phone also if not able to come due to urgent cause.

### **Management of Ankylosing Spondylitis through Yoga Practices**

The protocol introduced to the patient was mainly designed and focused for spine and improving breathing. *Yogic sukhsma vyayama* were primarily the main warm up practices for clearing nasal passage and improving breathing and awareness about breath. Practices like *Ucchara nSthaltatha Vishudh Chakra Shudhi*, *Buddhitath aDhriti Shakti Vikasaka*, *Medha Shakti Vikasaka*, *Kapol Shakti Vikasak*, *Karna Shakti Vikasak* and *Griva Shakti Vikasaka*<sup>1,2 & 3</sup> were primarily focused on enhancing breathing, awareness about breath and mobility of neck. *Asanas* like *Tadasana*, *Konasana* were specific for stretching the spine and improving blood circulation to entire body. This was further followed by the *Anuloma – Viloma* and *Bhramari Pranayama* for five minutes each with slow pace. *OM* chanting was introduced in split letters as “**Aaaaa**” “**Uuuu**” and “**Maaaaa**” in deep, prolonged and repeated manner for ten minutes. The patient was instructed to continue the same at home during the weekends. Patient had marked his pain intensity, range of movements etc on BATH INDICES before and after the *Yoga* therapy of four months entire practice. Patient was also given certain guidelines regarding his daily routine and dietary habits like avoiding cold and spicy food stuffs.

## Results

As Ankylosing spondylitis condition makes the vertebrae stiff and fused, *Yogic* practices were focused on relieving this stiffness by stretching. Initially the intensity of pain was reduced and the movement of spine was improved. Patients also reported that he was feeling better and able to perform all his daily routine in better way. Patient felt breathing, alignment of spine and range of spinal mobility improved. Results are shown in **Table-3**.

In the second week practice had shown more progressive changes by reducing pain and had improved with subjective feeling. The results are shown in **Table-4**

The third week practice has shown an improved sleep quality and reduced pain. The results are shown in **Table-5**. The tests results of pre and post are given in the **Table-6**

A graphical representation of symptoms and the effect of Yoga Therapy is illustrated in **Graph 1** and **Graph 2**. **Graph-3** shows the CRP value with pain and stiffness score.

The results of BATH Indices are shown in **Table 7**.

The results are shown in **Table 3-5** with reference scale of symptoms.\*

**Table 3: Results showing improvement in Ankylosing Spondylitis condition after one week of Yoga Therapy session**

Complaints	Before Yoga Therapy	After one Week of Yoga Therapy
Stiffness of Spine	+++++	++++
Lower back Pain	++++	++++
Indigestion	++++	+++
Insomnia	+++	++

**Table 4: Results showing improvement in Ankylosing Spondylitis condition after two weeks of Yoga Therapy session**

Complaints	After 1 <sup>st</sup> week of Yoga Therapy	After 2 <sup>nd</sup> Week of Yoga Therapy
Stiffness of Spine	++++	++
Lower back Pain	++++	+++
Indigestion	+++	++
Insomnia	++	+
Complaints	After 2 <sup>nd</sup> week of Yoga Therapy	After 3 <sup>rd</sup> Week of Yoga Therapy
Stiffness of Spine	++	+
Lower back Pain	+++	-
Indigestion	++	-
Insomnia	+	+

\*Reference scale: - Clear, + Minimal, ++ Mild, +++ Moderate, ++++ Severe

**Table 5: Results showing improvement in Ankylosing Spondylitis condition after three weeks of Yoga Therapy session**

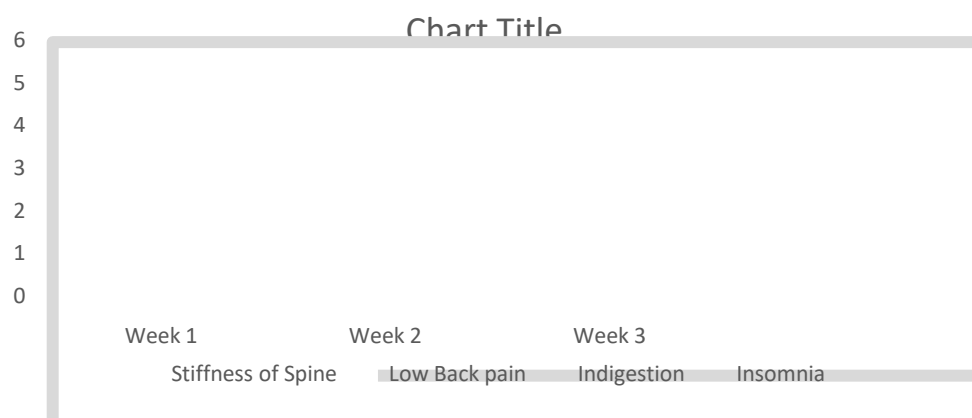
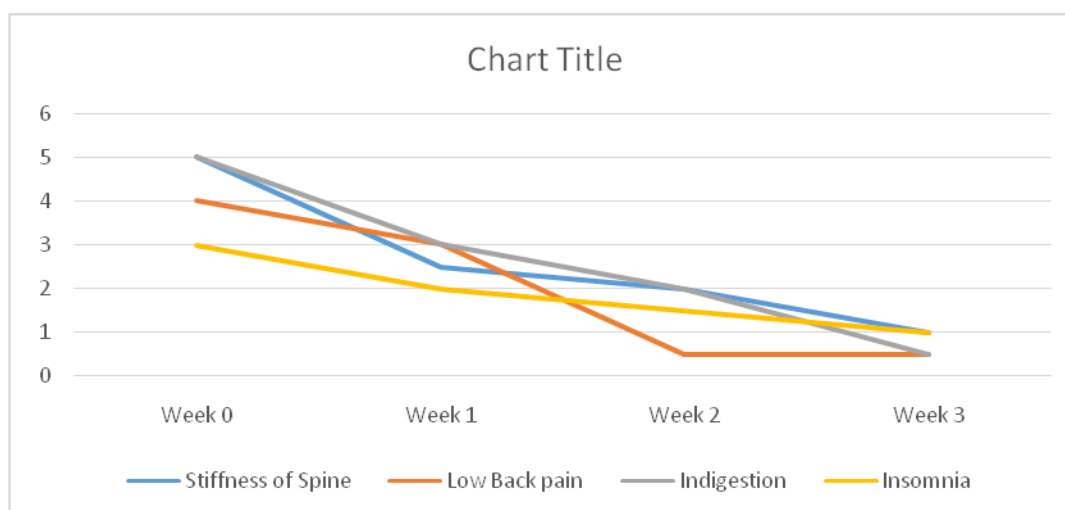
Complaints	After 2 <sup>nd</sup> week of Yoga Therapy	After 3 <sup>rd</sup> Week of Yoga Therapy
Stiffness of Spine	++	+
Lower back Pain	+++	-
Indigestion	++	-
Insomnia	+	+

**Table. 6: CRP value after 14 weeks of Yoga Protocol Practice**

S. No.	Date	CRP value	Yoga Therapy Status
1.	03-03-22021	11.39 mg / L	Before Yoga therapy
2.	21-06-2021	< 4	After Yoga Therapy

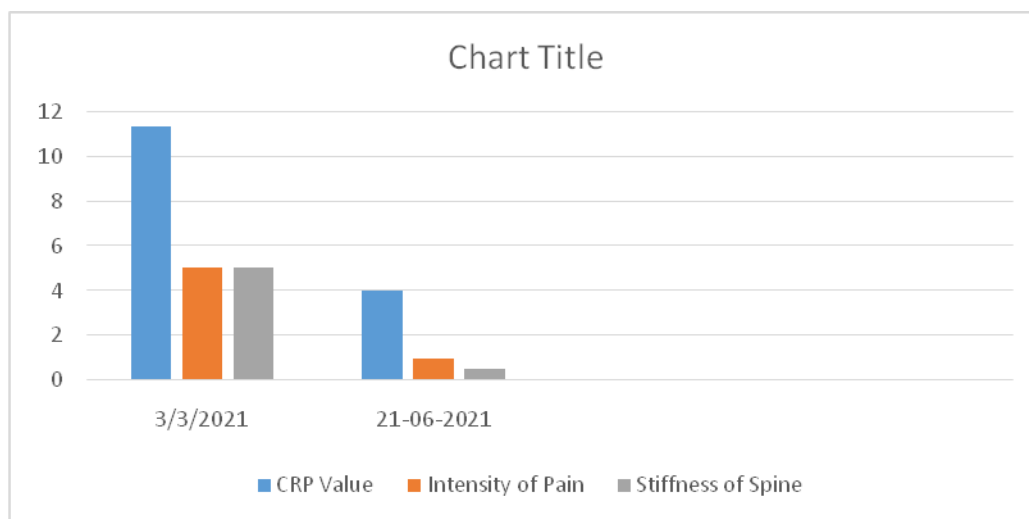
**Table-7: The results of Yoga Therapy measured on BASDAI score**

S.No.	BATH Indices	Before	After
1.	BASFI	5.0	1.4
2.	BASDAI	5.4	1.5
3.	BAS G	5.5	2.0

**Graph 1: Effect of Yoga Therapy on Ankylosing Spondylitis (From 09-03-2021 till 29-03-2021)**



**Graph 2: Effect of Yoga Therapy on Ankylosing Spondylitis (From 09-03-2021 till 29-03-2021)**



**Graph-3 CRP value with pain and stiffness after 14 weeks of Yoga Protocol Practice**

### Discussion:

*Yoga* is a complementary therapy that incorporates physical posture, breathing practices, relaxation techniques and meditation. The *Yoga* protocol followed in this case had specific effect on body and breath. *Yogic Sukshma Vyayama* practices like *UcharanSthaltathaVishudh Chakra Shudhi*, which improves blood supply around throat and improves breathing, might have helped the patient to breathe in a better. *BuddhitathaDhriti Shakti Vikasaka* in sequence with *Medha & Smaran Shakti Vikasaka* had been found effective in improving concentration, breath awareness and in removing the excess of phlegm from the throat and clear nasal passage. The neck movements exercises i.e. *Griva Shakti Vikasaka* - 1,2 & 3 make the neck muscles flexible, strong and well-conditioned by improving blood circulation and improved nerve functioning.<sup>[3]</sup> *VakshaSthalVikasak* 1 & 2 were found to be effective in improving costal muscles function, breathing and helped spine to be straight, which probably would have helped patient stretch well in asanas like *Tadasana* and *Konasana*. As these asanas stretch spine very effectively in association with *Marjari* asana which improves flexibility and mobility of the spine. They also do help

relieving low back pain as found in previous study which reported that *Yoga* improves functional disability, pain intensity, and depression in people chronic low back pain.<sup>[4]</sup>

*AnulomaViloima* and *Bhramari Pranayama* were probably helpful in bringing back sense of balance, reduce stress and improve sleep quality. A previous study showed that “OM” chanting strengthens the lung capacity, removes the stress. It is also shown that chanting of OM helps to overcome anxiety and depression feeling. <sup>[5]</sup> Which probably have helped the patient respond well to the practices and feel better. There are some other researchers in which two groups were taught Kundalini yoga and results exhibited that yoga group people having problems of ankylosing disorders of spine significantly improved. The yogic practices in the experimental group were modified to suit the need of the practitioner<sup>[6]</sup>

The BATH Indices score have shown progressive changes in patient’s overall condition. Reduced intensity of pain, increased range of overall joint movements and better feasibility in day to day activities were noticed. The subjects with Ankylosing Spondylitis (AS) could be treated with this innovative means of yoga. The earlier research has shown that using bath index gives very right assessment in the progressive improvement related to various activities done by the patient <sup>[7]</sup>.The integrated approach of *yoga* therapy; i.e. a combination of *Shodhan Kriyas* (Purificatory / cleansing practices), *Asanas* (physical postures), *Pranayama* (breathing practices with awareness on it), diet control or modifications, probably would be very effective and feasible practice in managing Ankylosing Spondylitis in a progressive manner.

Thus the yogic practices given in the current case study need to be studied at large scale to bring new findings related to spinal spondylitis. The case was a novel study to see the modified yoga practices in combination with dietary and life style modification. It is evident through the case study here that if integrated approach to the intervention is adopted it would be very effective to overcome the ankylosing spondylitis.

## Conclusion

Thus current case study has shown that patient had been relieved from spinal stiffness and joint pain. Patient also felt improvement in the quality of sleep. His C- reactive protein

value was noted to be reduced significantly after 14 weeks of regular. It indicates that yoga practices might have effect to reduce inflammation and infection at spinal joint. This case study also shows that recovery stage is exhibited indirectly in the current subject studied here. Future study may be focused to include more parameters to explore multi aspects of ankylosing spondylitis disorders.

### **Patient Perspective**

The patient was very much satisfied with the improvement he got from the practice of Yoga. He found the designed yoga practices very useful and feasible to be practiced even by him at home independently.

### **Limitations of the Study**

The case study presented here is based on the subjective reporting and two tests viz x-ray and CRP. To get the more precise finding to generalize for larger aspect a bigger study with robust research design need to be attempted.

### **Patient's written Consent:**

The patient's written permission has been obtained in the beginning of yoga practice intervention.

### **Acknowledgments:**

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NIL

### **Conflicts of Interest**

There are no conflicts of interest among authors.

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