

ROLE OF ARDHA-MATSYENDRASANA ON DISEASES OF ANNAVAHA SROTAS IN PERSPECTIVE OF SHARIR

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ABSTRACT

Yogasana brings great synchronization between mind, body and soul. It is one of the oldest practices to maintain the body and mind in good built. Especially today when there is an increase in globalization, urbanization and competition, *Yogasana* play most vital role in balancing equilibrium between mind and body. *Annavaha Srotas* is the channel which is in charge of the intake of food, digestion and absorption. The various diseases like constipation, obesity, indigestion; IBS, heart burn etc are pertained to *Annavaha Srotas*. The present article deals with the role of *Ardha Matsyendrasana* on diseases of *Annavaha Srotas* in perspective of *Sharir*. The necessary literary material was collected from classical text of Ayurveda and Yoga, texts of contemporary science, research articles and e-sources which are interpreted. The *Ardha-Matsyendrasana* (Half Spinal Twist Pose) is selected for analysis which relieves the problems of *Annavaha Srotas* with the aids of anatomical structures. So, it can be concluded that anatomical structures entail in *Ardha-Matsyendrasana* (Half Spinal Twist Pose) procedures helps to relieve the ailments of *Annavaha Srotas*.

Keywords: *Annavaha Srotas, Ardha Matsyendrasana, Yogasana*

INTRODUCTION

Ayurveda believes in mind body balance which is the main key of being healthy. Yoga is main part of it and helps in coordinating mind with body. *Yogasana* also stimulate the pranic channels and internal organs, so *asana* are complementary to exercise ^{1, 2}. *Annavaha Srotas* is one of those channels in the body which transport the food and liquids ingested. Whereas *Sharir* is formed by combination of *Dosha*, *Dhatu*, and *Mala* and any perversion (*Dushti or Vridhi*) in its function with their other measures lead to diseases of *Annavaha Srotas* ^{3, 4}. The

knowledge of *Sharira* is absolute vital and necessary for better understanding of etio-pathogenesis and treatment of various disorders of *Annavaha Srotas* ⁵. Many times one perform the *asanas* looking to the other person, without thinking whether the particular *asana* will be beneficial in context of his / her own body's anatomy and physiology ⁶. Hence, performing *asanas* in a wrong posture & unsafe technique may result in other medical problem or even harm the anatomical structures leading to some deformity.

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This article summarizes the current evidence of applied aspects of clinico-anatomical and physiological effects of *Ardha-Matsyendra-Asana* (Half Spinal Twist Pose) on various components on *Annavaha Srotas*.

AIM & OBJECTIVE

- To study the role of *Ardha-Matsyendrasana* in diseases of *Annavaha Srotas* in perspective of *Sharira*.
- To apply the principles of anatomy and physiology to understand *Yogasana*, health & ability to communicate with each other.

MATERIALS AND METHODS

All sorts of references has been collected and compiled from various available Ayurvedic and yogic classic texts like *Samhita*, available commentaries and text books along with modern science. Research articles from various websites related to *Yogasana* were accessed. All matter was analyzed for the discussion and attempt was been made to draw some conclusions.

OBSERVATIONS AND RESULTS

Ayurvedic Concepts of *Annavaha Srotas* (Gastro Intestinal Tract):

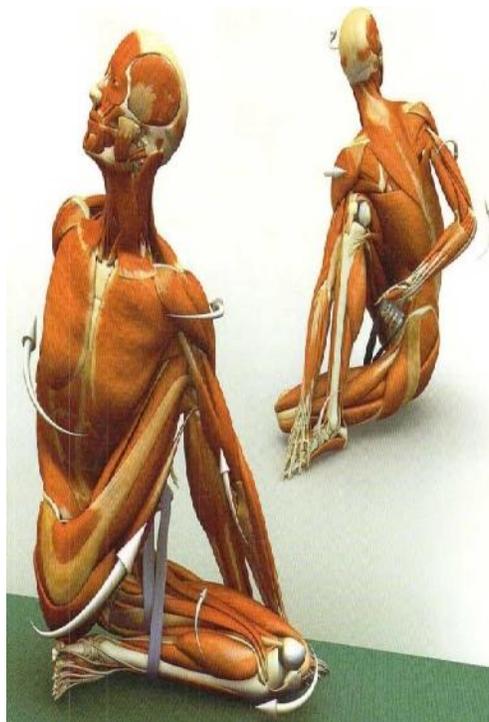
The *Srotas* or Channels which carry 'Anna' or food are called *Annavaha Srotas*. This can be correlated to the alimentary tract or gastrointestinal tract or digestive tract. According to Sushruta, *Strotomool* of *Anavaha Srotas* are *Amashaya* & *Annavahi dhamni* and its *Dushti Lakshas* are *Aadhmana*, *Shula*, *Anna Vidwesa*, *Chhardi*, *Pipasa*, with *Viddha Lakshana* are *Aandhya*, *Maranam*. According to Charak, *strotomool* of *Annavaha Srotas* are *Amashaya Vamaparshwa* and its *Dushti Lakshas* *Anana abhila*, *Arochaka*. Disease of *Annavaha Srotas*

can be managed by three principles *Deepan* (*Agni*), *Pachan* (*Aama*) and *Langhan*^{3,4}.

Physiology of *Annavaha Srotas*:

Annavaha Srotas physiology is related to the *Amashaya*, *Annavahi dhamani*, *Kshudantra*, accessory glands and abdominal muscles. The 1st stage takes place in *Amashaya*. *Pranavayu* carries the food and *Samanavayu* stimulates the *Jatharagni* which digests the food. Several digestive juices containing enzymes action of digestion take place and secretion of these enzymes action controlled by parasympathetic and enteric nervous system. That stage called as '*Madhura Avasthapaka*'. Salivary juice and mucous acts as protective like *Kapha*. *Kshudantra* is site of *Pachaka pitta*. This digested food divide into essential part '*Sara*' and waste part '*Kitta*'. The *Pachaka pitta* stands for all amyolytic, proteolytic, lipolytic and nucleic acids splitting enzymes and hormones. The 2nd stage that takes place in *Kshudantra* is known as '*Am-la Avasthapaka*'. *Accha pitta* (bile juice & pancreatic juices) secreted into *Grahani*. Nutrients are absorbed in *Kshudantra*. Bilirubin a derivative of hemoglobin metabolism represents "*Accha pitta*". The 3rd stage take place in *Bruh-dantra* known as '*Katu Avasthapaka*' where remaining undigested portion of food gets converted into solid fecal matter by drying effect of "*Agni*" and release with '*Vayu*' of "*Katu*" (pungent) nature. There is absorption of water and some electrolytes, no digestive activity take place. Undigested material is called as feces. *Katu* represents nature of '*Vayu*' releasing during this stage^{3,4}.

Ardha Matsyendrasana - Half Spinal Twist Pose ^{7,8,9}.



Ardha Matsyendrasana (Half Spinal Twist pose) is one of the best and most important *asana* in *Hatha Yoga* which is mentioned in *Gherand Samhita*. It has ample benefits which cover all the body systems.

Asana position:

In this position there is a strong twist on the spine and abdomen. The right arm is pressed against the left knee and the left arm is wrapped behind the back, leading to an increased twist on the body. The chest is open and the spine is erect. One side of the abdomen is compressed and the other side is stretched. The right leg and knee remains on the floor. The left knee should be close to the right armpit ^{8,9}.

Basic joint positions:

- Hip of the leg that remains on the floor flexes, abducts, and externally rotates.
- Hip of the other leg flexes, adducts, and internally rotates.
- Knees flex and Ankle of the foot that is held plantar flexes.
- Trunk flexes and rotates. Forearm pronates.
- Shoulder of the arm behind the back extends and internally rotates.
- Elbow of the same arm flexes and the forearm supinates.
- Shoulder of the arm that holds the foot abducts and externally rotates. The elbow of the same arm flexes ⁹.

Involvement of nerve plexus- Coeliac Plexus (Solar Plexus)

Physical Benefits:

1. Increases appetite, destroys most deadly diseases, and awakens *Kundalini* and *Muladhara chakra* ⁵.
2. Opens the chest and increases the oxygen supply to the lungs ⁷.

3. Increases purification of the blood as well as the internal organs ⁹.
4. Useful for diabetics (b-cells & t-cells), with concentration on the pancreas ¹⁰.
5. Regulates the secretion of bile and adrenaline ¹⁰.
6. Stimulates functioning of the liver and kidneys ^{11, 12}.
7. Increases the elasticity of the spine, tones the spinal nerves and improves the functioning of the spinal cord ¹³.

Therapeutic applications:

Diabetes, Constipation, Anorexia, Cervical Spondylitis, Urinary tract disorders, Menstrual disorders, Indigestion, Asthma and infertility ⁵.

Duration: To begin with this asana may be held for only a short time but should gradually be built up to 2 minutes. After more practice it can be held for up to 5 minutes on each side ⁹.

Follow up poses:

After practicing this pose consistently for some time full *Matsyendrasana* can be practiced ⁹.

Anatomical relation with Ardha Matsyendrasana (half twist spinal poses) below tables^{14, 15}

Table 1: Muscles involved in *Ardha Matsyendrasana*^{14, 15}.

SN	Name of Muscle	Origin	Insertion	Function
1	Rectus Abdominis	Symphysis pubis and pubic crest	5 th , 6 th and 7 th costal cartilages and xiphoid process	Compresses abdominal contents, flexes vertebral column, accessory muscle of expiration
2	External Oblique	Lower 8 ribs	Xiphoid process, linea alba, pubic tubercle, iliac crest	Supports abdominal contents, assist in forced expiration, micturation, defecation, parturition, vomiting
3	Internal Oblique	Lumbar fascia, iliac crest, lateral two-thirds of inguinal ligament	Lower three ribs and costal cartilages, xiphoid process, linea alba, symphysis pubis	Supports abdominal contents, assist in forced expiration, micturation, defecation, parturition, vomiting
4	Transverse Abdominis	Lower six costal cartilages, lumbar fascia, iliac crest, lateral third of inguinal ligament	Xiphoid process, linea alba, symphysis pubis	Compresses abdominal contents
5	Sternocleidomastoid	manubrium sterni & clavicle head from middle part of clavicle	mastoid process of the temporal bone of the skull	Head maintain fixed position, an accessory muscle of respiration, along with the scalene muscles of the neck.
6	Splenius capitis	nuchal ligament and spinous process of C7-T3	mastoid process of temporal & occipital bone,	extend, rotate, and laterally flex the head,
7	Piriformis	sacrum	greater trochanter,	external rotator of thigh,
8	Superior gemellus	spine the ischium	obturator internus tendon	rotated laterally thigh
9	Obturator internus	ischiopubic ramus & obturator membrane	greater trochanter	abduct & laterally rotated Inferior gemellus
10	Rhomboids- rhomboid (major & minor),	spinous processes of the thoracic vertebrae T2 to T5 as well as the supraspinous ligament	Medial border of the scapula, from about the level of the scapular spine to the scapula's inferior angle.	Pulls scapulae medially, rotates scapulae, Holds scapula into thorax wall
11	Erector spine	Spinous processes	spinous processes of	extends the vertebral column

		of T9-T12 thoracic vertebrae, medial slope of the dorsal segment of illiac crest	T1 and T2 thoracic vertebrae and the cervical vertebrae, extends the vertebral column	
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Table 2: Organs involved in *Ardha Matsyendrasana*¹⁵.

SN	Name of organ	Functions
1	Stomach	Holds food still mixed with enzymes, Cells in the lining of the stomach secrete a strong acid and powerful enzymes that are responsible for the breakdown process.
2	Pancreas	Secretes digestive enzymes into the duodenum, which break down protein, fats, and carbohydrates. Pancreas also makes insulin, secreting it directly into the bloodstream.
3	Small Intestine Consist of 3 segments- duodenum, jejunum, and ileum	Breaks down food using enzymes. Duodenum-continuous breaking-down process, Jejunum and Ileum - absorption of nutrients into the bloodstream.
4	4 Large intestine (colon) as- cending (right) colon, transverse (across) colon, descending (left) colon, and sigmoid colon	Process waste materials, contains bacteria which perform functions, such as synthesizing various vitamins, waste products and food particles, and protection against harmful bacteria.
5	5 Liver	Processing of nutrition absorption nutrients, Secretion of Bile, role in digesting fat, detoxifies potentially harmful chemicals.
6	6 Kidney	Produces hormones, absorbs minerals, filters blood and produces urine.
7	7 Supra renal gland (adrenal gland) -2 parts adrenal cortex and medulla	Adrenal cortex- 3 Hormones: mineralocorticoids which conserve sodium in the body, glucocorticoids which increase blood glucose levels, and gonadocorticoids which regulate sex hormones such as estrogen. Medulla - secretes epinephrine and norepinephrine in times of stress.
8	8 Gallbladder	Stores and concentrates bile, and then releases it into the duodenum to help absorb and digest fats.

Nervous Regulation of the Digestive System

1. Para sympathetic nerve supply the greater part of GI tract through Vagus (stimulate intestinal movement and the sphincters)¹⁶.
2. Postganglionic parasympathetic neurons for gut located in the thoraco-lumbar region of spinal cord, they travel through splanchnic

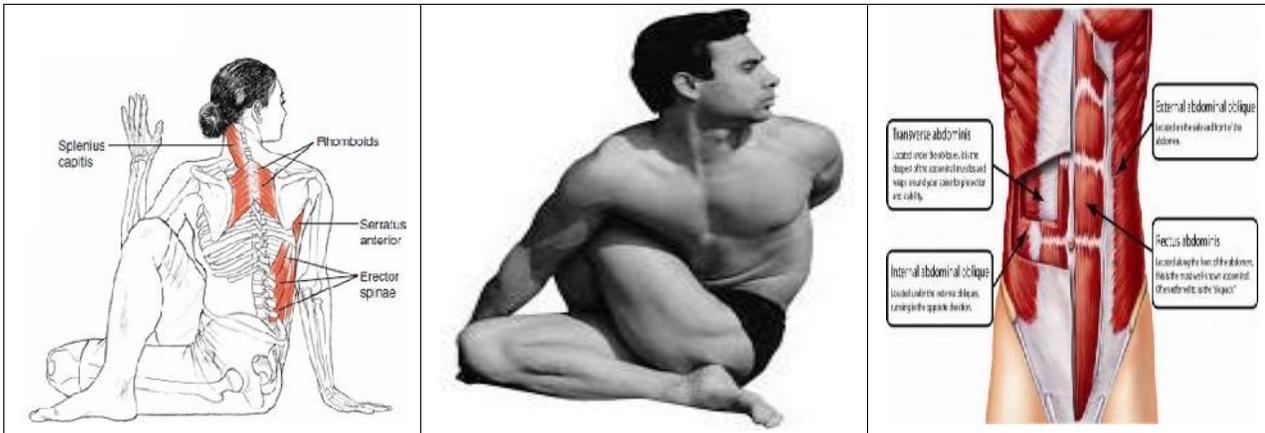
nerves to terminate in plexus related arteries (Coeliac, mesenteric) and aorta. Neurons travel along blood vessels to reach the gut¹⁶.

3. Celiac Plexus or Coeliac Plexus: Also known as the solar plexus because of its radiating nerve fibers, complex in nature and it is a branch of autonomic plexus in abdomen. The plexus is formed (in part) by the greater

and lesser splanchnic nerves of both sides, and fibers from the anterior and posterior vagal trunks. The celiac plexus proper consists of the celiac ganglia with a network of interconnecting fibers. The aorticorenal ganglia are often considered to be part of the celiac ganglia, and thus, part of the plexus^{14, 15, and 17}.

4. Enteric nervous system (ENS): This system sends and receives impulses, records expe-

riences and respond to emotions. Its nerve cells are bathed and influenced by the same neurotransmitters. The gut's brain or the "enteric nervous system" is located in the sheaths of tissue lining the esophagus, stomach, small intestine and colon. Enteric nervous system mirrors the central nervous system¹⁸.



DISCUSSION

Ayurveda believes in “Prevention is better than cure”, so it’s time to educate mankind about the need of introducing yogic exercise in daily routine life style. Gut is known as second brain in abdomen. In order to keep this GI system healthy *Yogasana* can be instrumental. But for practicing *yogasana* it is essential to acquire knowledge about *Sharira*. The entire digestive and other parts are properly held and protected by means of very strong muscles that form the wall of the belly. This abdominal wall prevents displacement of the internal organs with in the abdomen. It provides mechanical support to the abdominal viscera, maintains the tone of the involuntary muscles of the abdominal organs. There are several ailments that occur in the digestive tract due to various reasons. Various diseases of *Annavaha Srotas* caused due to several reasons like unhealthy lifestyle, consuming

unproper & unhealthy of foods, chronic indigestion, and extra sensitive digestive system

Ardha Matsyendrasana plays a vital role in maintaining the healthy status of *Annavaha Srotas*. In *Ardha Matsyendrasana* - Abdominal viscera containing the groups of muscles - Rectus Abdominis, Transverse Abdominis, External and internal obliques get stretched. Stretched muscle gets tensed which may lead to an increase in the stretch of the muscle via nerve reflexes. It engages a muscle that is stretching & stimulates the Golgi tendon organ. This causes the spinal cord to signal that same muscle to relax. *Ardha Matsyendrasana* is one of the most effective poses for isolating these hard-to-access muscles. It establishes correct local joint positioning in order to maximize the distance between proximal & distal attachments of individual muscles and muscle groups.

In *Ardha Matsyendrasana*, Tensioning of nerves establishes correct whole body positioning (e.g. curvature of the spine) in order to maximize neural tensioning especially of those nerves involved with the correct functioning of muscles that are being stretched, strengthened or relaxed. *Ardha Matsyendrasana* work by safety stretching muscles and all other soft tissues which provides flexibility that also improves the core strength of the human body. With better core strength by practicing this *asana* it can help to expand our lung capacity and improve endurance. Nervous and circulatory systems also play roles in the digestive process. Together, a combination of nerves, hormones, bacteria, blood, and the organs of the digestive system completes the complex task of digesting the foods and liquids a person consumes each day. When the organs of the GI Tract are compressed in poses, stale and waste-bearing fluids in those areas are encouraged out of the tissues. Once these materials are freed up, the body is better able to eliminate them. In this systematic way, yoga poses massage the vital organs associated with the digestive system, stimulate the digestive muscles and increase the wave like movements in the body that are known as Peristalsis. Breathing exercises send oxygen deep into the cells of the body and help it to absorb nutrients and excrete waste products thoroughly.

Body activated the "flight or fight" response in the central nervous system. In a matter of seconds, most of the blood in the body gets shunted out from the GI tract and into the major muscle groups. This has a negative impact on the contractions of the digestive muscles that help move food through the body as well as the fluids and secretions that are needed for healthy of *Annavaha Srotas*. *Ardha Matsyendrasana* is truly beneficial for the internal organs and to relieve the stiffness in the back while twist the position. *Ardha Matsyendrasana* also calms the

mind, which in turn relaxes the digestive system and leads to more effective elimination, increase the space in the abdomen and facilitate the release of entrapped gases. In essence, the *Ardha Matsyendrasana* reduces the stress response, rebalance the autonomic nervous system and create a powerful relaxation response that allows the healing functions of the parasympathetic nervous system to occur.

CONCLUSION

Yoga is emphasized as a preventive measure as well as therapeutics for several disorders of *Annavaha Srotas*. It plays a major role in promotion of positive health at physical, mental, emotional and spiritual levels and in rehabilitation. The *Ardha Matsyendrasana* practice plays major role in disease of *Annavaha Srotas* which reduces the physical and mental stress. The organs and glands are linked physiologically as well as anatomically in which digestion and absorption occurs in stages. Therefore, the practice of *Ardha Matsyendrasana* increases the quality of life in the perspective of *Sharira* which results in reduction in the frequencies of flares of *Annavaha Srotas* diseases, as well as improvement in clinical symptoms and increase ability to cope up with *Annavaha Srotas*.

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