

# ANATOMICAL EXPLORATION OF COMPLICATIONS OF ABNORMAL SITTING POSTURE AND ITS MANAGEMENT

**Dr Sushil Kumar Jangid\*1**

Assistant Professor, Agadanttra Department,–  
Shekhawati Ayurved College, Pilani, Rajasthan -333031

**Dr Kirtibala Tawde\*2**

MD Second Year, Anatomy Department,-  
Govt, Dhanwantari Ayurved medical college, Ujjain, MP-456001.

## ABSTRACT:

In this era of competitive and technical world, people are becoming more laborious mentally instead of physically. Occupational disorders are increasing day by day and due to long term sitting jobs, complications related to sitting posture are one of them. This sedentary lifestyle is developing over time. Lumbar pain, cervical pain, shoulder pain, ankle pain, haemorrhoids, varicose vein etc. are common posture related problems. To prevent these, first of all the knowledge about the normal sitting posture is necessary. Posture may be defined as, “*the position of one or many body segments in relation to one another and their orientation in space*” (Ham et al, p26). From a biomechanical viewpoint, good posture is dependent on the balance of the skeleton and symmetrical alignment of body segments. The majority of the literature refers to the 90-90-90 position as the normal upright neutral seated posture. These problems can be treated by using some techniques and by using some instruments. Correction in the abnormal posture can be done by using foot pad, hand pad and maintaining a perfect height of chair according to the person’s height. With these correction person can avoid this posture related problems.

**Keywords-** Lifestyle, Sitting Posture.

## INTRODUCTION

The human body is a fantastic piece of biological equipment which is essentially a strong movable frame (which we know as the skeleton) surrounded by a series of strong flexible muscles which are connected to the skeleton by ligaments. This ingenious set up enables us to move around at our will with a large degree of freedom and control. However due to the nature of our daily lives in this day, many of us develop poor posture. Modern working jobs such as typing and writing means that some of us hold our bodies in a bad posture for hours at a time, each and every day. Today, more than 75% of all employees in industrial countries have jobs that require working in a sitting position. Prolonged static sitting increases the risk of musculoskeletal disorders in the neck, shoulders, arms, and legs. This means we do not hold our body in a good position when doing things such as walking or sitting at a computer desk.

To prevent these, first of all the knowledge about the normal sitting posture is necessary. Posture may be defined as, “*the position of one or many body segments in relation to one another and their orientation in space*” (Ham et al, p26). This is a concern for many as a good posture provides us with a series of benefits such as a strong spine, and a higher sense of self confidence. It also gives the impression to others we encounter that we are strong, intelligent and capable.

## ANATOMY OF POSTURE.

Good posture is a combination of balanced strength and flexibility in the skeletal muscles, enabling people to walk, sit or stand in a graceful manner. Conscious activation of the postural muscles is important, especially when sitting or standing for long periods of time. The Cleveland Centre, rated one of America's best hospitals, advocates training the body to move in such a way that the least strain is placed on supporting muscles during movement and weight-bearing activities. The postural muscles are primarily located in the torso.

### **Head Support:-**

Weighing between 10-12 pounds, the average adult head must be carried over the spine in balance to avoid pain and discomfort in the neck and spine. The scalenus, prevertebral, and sternomastoid muscles enable the head to flex when touching the chin to the chest. The extensor muscles of the neck, used to point the nose towards the sky, are named splenius, semi-spinalis and capitis.

### **Shoulder Girdle:-**

Anchoring the shoulder blades to the spine is a flat, triangular shaped muscle called the trapezius. This muscle covers the neck, shoulders and thorax. Effective posture necessitates that the trapezius muscle is strengthened equally in the front and back of the body. The most common imbalance of this muscle is overextended across the back, and too short or tight across the chest, enabling the shoulder blades to pop out like wings, which often causes pain and discomfort.

### **Structures supporting spine:-**



The upper cervical spine has a curve, convex forward, that begins at the axis (second cervical vertebra) at the apex of the odontoid process or dens, and ends at the middle of the second thoracic vertebra; it is the least marked of all the curves. This inward curve is known as a lordotic curve. The thoracic curve, concave forward, begins at the middle of the second and ends at the middle of the twelfth thoracic vertebra. Its most prominent point behind corresponds to the spinous process of the seventh thoracic vertebra. This curve is known as a kyphotic curve.

**Ligaments:-** There are different ligaments involved in the holding together of the vertebrae in the column, and in the column's movement. The anterior and posterior longitudinal ligaments extend the length of the vertebral column along the front and back of the vertebral bodies. The interspinous ligaments connect the adjoining spinous processes of the vertebrae. The supraspinous ligament extends the length of the spine running along the back of the spinous processes, from the sacrum to the seventh cervical vertebra. From there it is continuous with the nuchal ligament.

**Muscles:** The erector spinae is a group of muscles that work together to extend the vertebral column and thus maintain good posture. The muscles are innervated by the spinal nerves. The spinalis and longissimus muscles, the iliocostalis muscles help to extend the neck and the vertebral column. The multifidus muscles, a smaller group deep in the back, connect the vertebra. Quadrates lumborum muscles contract, they depress (or

pull down) the ribs, and they also aid in lateral flexion of the vertebral column. Abdominal abdominis by contraction flexes the vertebral column (lumbar flexion).

### **Pelvic Region:-**

Many multi-tasking muscles are located in this region of the torso, including some postural muscles. Transverse abdominis is a flat, horizontal muscle lying below the belly button. Working synergistically with the abdominal muscles are the iliopsoas muscles to support the lumbar back. According to Lawrence Gold, practitioner of The Dr. Ida P. Rolf method of Structural Integration, "A protruding belly may indicate tight psoas muscles, not weak abdominal muscles." The tail end of the posture support structures are the gluteus and hamstring muscles.

## **POSTURE RELATED PROBLEMS**

### **Back pain:**

A recent research study demonstrated people with chronic low back pain really do move differently from people without pre-existing back pain issues, and also cannot balance as well. When compared to pain-free individuals, and even in the absence of pain, low back pain (LBP) patients used their lumbar spine muscles less, impairing their ability to control their posture and balance. The researchers hypothesized that "motion of the lumbar spine is altered in people with chronic LBP, and this would be associated with compromised control of postural stability in response to unexpected perturbation".

Researchers found that patients with back pain were less efficient at maintaining balance and controlling their posture when they moved their arms, supporting the Strong Posture concept that postural disuse atrophy of deep stabilizing spinal muscles like the multifidus weakens balance, leading to falls as well as weak posture. The investigators concluded that "the quality of balance control is compromised in low back pain patients and that this is associated with poor use of spinal motion as a component of the postural strategy.

### **"Changes in posture and changes in motion cause the body to change"**

Pain causes the body to compensate and move differently to avoid pain. Over time, muscles and ligaments become trained to move differently. Some muscles become overly strong, while others become weaker. The resulting unbalanced motion leads to postural changes, uneven wear, and aggravates injuries and the pain cycle begins again.

### **Lower extremity pain:-**

Lower extremity pain maybe due to the effect of stress on those joints from not moving them often enough or might be due to stress on lower extremities by moving with poor posture. Postural lower extremity pain is a common and often painful problem which can begin with an injury, accident or from long-term habits. When the upper body is not aligned with the lower body, weight bearing is not balanced and leads to uneven pressure on the lower extremity on moving. Even sitting "wrong" can stress the pelvis and set up lower extremity and leg imbalance.

Chronic posture stress maybe a resultant of activities such as carrying a heavy backpack, pocketbook etc.

Related Conditions: Foot pain; ankle pain; leg pain; thigh pain; Achilles tendonitis; gait imbalances; hip pain; iliotibial band syndrome; meniscus or knee injury; plantar fasciitis; running injuries; sciatica; shin splints; pinched nerve in back; muscle pulls; hamstring strain; muscle imbalances, muscle pulls, muscle strains, muscle weakness, myofasciitis, postural adaptive muscle strain; pinched nerve.

### **Neck Pain**

The neck is a chain of 7 bones connected by ligaments and wrapped in muscles which support a fifteen-pound weight- your head. Postural neck pain is a common and often painful problem from constantly working to balance your head on your trunk. Headaches and shoulder/arm/hand pain is frequently seen when there is also nerve involvement.

In time, compensation to avoid pain means you keep adapting until there's only one way you can move without causing pain. And then even that goes away and it hurts regardless of what you do. Episodes of neck pain may come on after over-activity or without apparent cause, and is triggered as body adapts to mechanical stress, weak posture and inefficient motion. e.g.

- Hunching over a computer for hours at a time
- Chronic posture stress such as carrying a heavy backpack, pocketbook, or child

Related Conditions: Postural neck muscle strain, pinched nerve in neck, Cervico-brachial syndrome, Cervico-cranial syndrome.

### **Shoulder Pain**

The shoulder is the most unstable joint in the body. Usually related to weak or poor posture, postural shoulder pain is a common and often painful problem from constantly working to control and use your hands as you balance your shoulders on your torso. Shoulder pain, arm pain, elbow pain and even hand pain is frequently seen when there is also nerve involvement.

### **Joint and Foot Pain**

Those people who suffer with a poor posture can also experience difficulty in their joints and in their feet too.

Normally this is due to the skeletal system becoming poorly aligned and so pressure is placed on areas of the body which are not designed to take it.

### **Arthritis and Degenerative Joint Disease**

Arthritis, also known as osteoarthritis, degenerative joint disease and DJD is a mechanical irritation of the joint, usually due to unbalanced motion. The joint responds to the unbalanced and stressed motion with formation of bone spurs on the edges of the bone.

### **Carpal Tunnel Syndrome**

Carpal tunnel syndrome (CTS) usually begins with occasional hand and wrist numbness. Most people ignore CTS when it is in its early stages. Over time, the numbness persists and turns into pain and hand weakness.

Carpal tunnel syndrome (CTS) is not a disease but a musculoskeletal disorder brought on by overworked muscles in the neck, shoulder, arm, forearm, and hand.

### **What should be the proper posture of sitting:-**

The 90-90-90 position is a useful starting point to for symmetry with further seating adaptations / components being used to assist function.

- Not leaning forward
- Shoulders relaxed
- Feet flat on floor
- Arms close to sides
- Elbows bent 90°
- Lower back may be supported

### **MANAGEMENT:**

1. **Proper sitting posture:** The computer screen should be positioned so the middle of the screen is at eye level (when sitting in a totally upright position). Crossing of legs while sitting can cause the hips to move out of line which results problems in the upper back. In this way care should be given maintaining the posture. After leaving sitting posture clasping hands together and hold them up in front, pushing shoulders forward and drawing the head back, looking up at the ceiling stretches muscles out and pulls them back into alignment.

2. **Exercise-** The best way to improve the posture is to focus on exercises that strengthen the core, the abdominal and low back muscles that connect to your spine and pelvis. Some of these muscles move torso by flexing, extending, or rotating your spine. Others stabilize the pelvis and spine in a natural, neutral position. Old-style sit-ups used only a few of these muscles, often with jerky momentum. Today's yoga, Pilates, and core fitness programs targets entire core with slow, controlled movements to get the most out of workout.

3. **Time interval of relaxation-** 5-15 minute rest after every hour

### **4. Supportive solution - Modular seating solutions**

Modular seating is that which uses a range of adjustable components such as seat base, seat back, foot rests, head support and mobility bases along with a choice of accessories such as pelvic supports and lateral trunk supports, to meet a scope of clinical needs. Depending on the complexity of the needs of the user, and the subsequent set-up, the modular system may perform like a bespoke piece of equipment. The benefits of modular seating are the room for growth and adjustment, ease of transfers, increased potential for function and the reusability of the system.

### **Bibliography:**

1. Tortora Gerard J. Principle of Anatomy and Physiology edi.8 Harper Collins College publishers 1996.
2. Moore Keith L. Clinical Oriented Anatomy edi.7 Lippincott William & Wilkins.
3. Singh Vishram Clinical and Surgical Anatomy Edi.2 Elsevier Publisher 2013.

4. Hastings J. Seating assessment and planning. *Topics in Spinal Cord Injury Medicine* 2000
5. www.wikipedia.com
6. www.emedicine.medscape.com
7. www.gatheglos.com
8. www.leckey.com

