



Effect of *Ushtrasana* (camel pose) on thoracic muscles hereby affecting lungs as a organ of respiration

Gadge Akshata Satish

Associate Professor, Sharir Rachana Department,
 YMT Ayurvedic Medical College, Kharghar, Navi Mumbai.

*Author Correspondence: akshatagadge24@gmail.com; 8087496602

ABSTRACT – *Yoga* is essential for physical and mental wellbeing of human. *Yoga* comprises of (*Asana*) Postures, Meditation and *Pranayama* (various breathing techniques). Aim – Present study aims at establishing effect of *Ushtrasana* (Camel Pose) on Lungs as a Respiratory Organ. Material and Methods – Literature study will be done. Various research publications and papers will be referred. Asanas will be studied. Muscles acting throughout posture will be studied. Discussion and Conclusion- On the basis of the literature the discussion and Conclusion will be drawn. Daily practice of *Ushtrasana* is beneficial for maintaining health of an individual suffering from respiratory diseases.

KEY WORD – *Ushtrasana* (Camel Pose), Muscles, Lungs

INTRODUCTION – *Ushtrasana* was described as one of the most important Asana among 32 *Asanas* described in *Gheranda Samhita*. The name *Ushtrasana*

originates from the Sanskrit term in which the meaning of “*Ushtra*” is camel and the meaning of “*Asana*” is sit, pose or posture. So *Ushtrasana* is “camel pose”. In this posture, the back is curved. The curved shape is formed in front side of the body, looks similar like a camel hump. Pulmonary Ventilation comprises of Inspiration and Expiration which is carried out mechanically by

Thoracic cage: sternum, 12 ribs, 12 thoracic vertebrae

Inspiratory muscles: diaphragm, intercostal muscles

Accessory inspiratory muscles: sternocleidomastoid, scalene muscles, serratus anterior, pectoralis major, pectoralis minor, trapezius, latissimus dorsi, erector spinae, iliocostalis lumborum, quadratus lumborum

Expiratory muscles: rectus abdominis, transverse abdominis, external oblique, internal oblique muscles

Any complex muscular activity involves finely co-ordinated isometric and isotonic muscle contractions. To understand the mechanism of *Asana* it is essential to know this two types of muscle contractions.

- 1) Isometric Contraction – during contraction length of muscle does not change but the tension is developed in muscle. It brings about considerable increase in heart rate and blood pressure which may damage weak arteries.it helps to maintain steady posture. If a muscle is contracted regularly in this way it increases in girth and becomes stronger.
- 2) Isotonic Contraction – during contraction tension does not change but the length of muscle changes. All warm up exercises are isotonic and helps increase the stamina and endurance.

AIMS AND OBJECTIVES –

1. To study muscles involved while performing *Ushtrasana* (Camel pose)
2. To study the relation between the muscles acting in *Ushtrasana* and Respiratory System.

MATERIAL AND METHODS -

- 1) Review of Yoga-Asana literature from Yoga Classics including commentaries.
- 2) Previous published articles, research papers, online websites journals, magazines etc.
- 3) An effort by self will be made to identify muscles taking part in posture.

There are several steps involved to perform *Ushtrasana*.

- 1) Sit on the yoga mat on your knees. Keep your knees at hips apart-width.
- 2) Keep your palms on your hips.
- 3) Lean towards back and push hips forward.
- 4) Remove palms from the hips and hold your heels so that fingers are on outer aspect and thumb on inner aspect.
- 5) Bend your spine, neck and head backwards.
- 6) Continue to hold this pose for about 30 seconds to a minute while breathing deeply.

Actions –

Spinal extension; Hip extension and Internal rotation; Knee extension; Scapula downward rotation, adduction, elevation; arm external rotation, extension, adduction; elbow extension

Working -

Arms: The triceps - extend the glenohumeral and elbow joints

the trapezius and rhomboids adduct the scapulae.

The posterior deltoids and teres major also extend the glenohumeral joint, while the subscapularis protects it anteriorly

Pectoralis major and minor, coracobrachialis, biceps, and anterior deltoids all stretch.

Spine: In the cervical spine, the anterior neck muscles (longus capitis, longus colli, rectus capitis anterior, suprahyoid, and infrahyoid) work eccentrically to keep the head from collapsing. Also working eccentrically to prevent collapsing into the lumbar spine are the rectus abdominis,

obliques (especially external), intercostals, subcostals, iliacus, and psoas major and minor.

Legs: The rectus femoris is working eccentrically against the weight of the pelvis moving backward, and the *vastii* are working concentrically to press the shins into the floor. The hamstrings and adductor magnus are also working concentrically—mainly to stabilize the knee and hip joints.

Spine: In the cervical spine, the anterior neck muscles listed earlier are working at length, but the sternocleidomastoid should be lengthened and relaxed to avoid the base of the skull being pulled into the atlas and axis.

The *scalenes* are also providing support for the anterior spine, as well as the breath. In the thoracic region, the internal intercostals are stretched by the opening of the rib cage, as are the *scalenes*

DISCUSSION -

In *Ushtrasana*, the thoracic structures are maintained in an “inhaled” position, and the abdominal wall is stretched. This results in a decreased ability of the body to breathe “normally.” The vertical diameter of the thorax is increased by the descent of the diaphragm. When diaphragm contracts in inspiration, initially the lower ribs are fixed and the vault of the diaphragm descends. Eventually vertical diameter of the thorax increases. The descent of the diaphragm is associated with downward displacement of upper abdominal viscera, and the anterior abdominal wall bulges forward to accommodate the displaced organs. When the limit of forward bulging is reached, the descent of the diaphragm ceases and the central tendon becomes fixed. On further

contraction of central tendon, the lower ribs are elevated and the volume of thorax is further increased by widening the transverse diameter.

The transverse diameter is increased by two ways active and passive.

- 1) Active increase is observed in 7th to 10th ribs, where movement takes place around an anteroposterior axis from *costo-vertebral* to *costo-sternal* joints.
- 2) This produces elevation of the middle of the rib by outward twist, which resembles lifting of the handle of bucket. The bucket handle movement is produced partly by the lower intercostal muscles and partly by the diaphragm
- 3) Passive increase is found in the upper six ribs which is facilitated by the curved nature of articular surfaces of the costotransverse joint.

Diaphragm – principal muscle of inspiration, as during contraction increases all diameters of thorax

Intercostals – elevate the obliquely placed ribs and increase the anteroposterior and transverse diameters.

Scalene muscles and sternomastoid – are active in deep inspiration, the former elevate the first and second ribs and latter elevates the clavicle.

Pectoral muscles and serratus anterior – are brought into action in forced inspiration after taking fixed position from the upper limb bones.

The increased in rectus abdominis activity supports the measurement of muscle activity in the rectus abdominis as a means of examining the effects of breathing exercises

on pulmonary function. *Ushtrasana* induces diaphragm movements and contractions in the internal *intercostalis* muscles as a result of active and strong contractions in the rectus abdominis, thereby further facilitating respiratory activity and increasing respiratory muscle activities

CONCLUSION – *Ushtrasana* (Camel Pose) in which thoracoabdominal muscles affects thoracic and abdominal cavity. Lungs are vital organs present in thoracic cavity and major part of Respiratory system. *Yogasanas* when practiced daily can be useful for increasing the lungs capacity and hence respiratory values. Practicing *Ushtrasana* stimulates breathing and blood circulation as it also opens the Heart Chakra.

So *Ushtrasana* can be recommended in patients of Respiratory System like Asthma.

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