THE HEALTHY SPINE AND YOGA

By Dr. Rita Khanna

You are as young or healthy as your spine. 'Keep the spine erect,' you will often hear the teacher calling the instruction in a class of Yogasanas. In the entire animal kingdom, the human being has the most erect spine. Let us see the implications of this instruction. In Kundalini Yoga, it has a significance of its own, as far as the Nadis and Chakras are concerned; but in this article, we shall consider only from the anatomical point of view.

Upon entering the world, a newborn baby's spine is flexed (bent forward) at the beginning. Later, when the infant turns on its tummy, and starts to raise its head, it develops the first backward curve of the spine, in the cervical (neck) region. Still later, when the young child first stands on its own feet in the erect position, it develops another backward curve in the lumbar (lower) region. These curves will continue to develop until growing continues.

BACKWARD LUMBAR CURVATURE OF THE SPINE

While standing in the erect position, the lumbar spine has to bear the weight of the upper half of the body. Due to this, and also due to strides of the legs in erect walking, the spine develops this backward curvature which pre-disposes man alone, amongst all the animals, to a new range of evolutionary spinal diseases, including low back pain, slipped disc, sciatica, scoliosis, and spondylitis.

In addition, various disturbances of digestion, menstruation, and reproduction arise, due to congestion and irritation of emerging spinal nerves in the lumbar region. Another disadvantage of the erect posture is the increased likelihood of developing piles (hemorrhoids) and varicose veins, because the column of venous blood from the legs and rectum, has to travel so much further upwards against gravity to reach the heart.

THE STRUCTURE OF INDIVIDUAL VERTEBRA

•The spine is like the trunk of a tree, supporting the entire body structure. Atop this trunk, sits the bony, enclosed cranium or box of the skull, containing the most important of all human organs – the brain – which not only controls the human body, but gives a real purpose to its existence.

•The top-most vertebra is called the atlas, because it supports the round head like the Greek mythical figure Atlas, who supported the earth upon his shoulders.

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- The second vertebra is the peg-like axis, so named because the atlas and skull rotate upon it. Thus, the head moves both independently of the movement of the neck, and with the neck as well. Of the 33 vertebrae of the column, these are the only two which are named. All the others bear only numbers.

- In the thoracic region, the spine supports the expansive rib cage, which is composed of bones (ribs), muscles, and cartilage. The rib cage surrounds the lungs and the heart, which are next in importance to the brain. The lungs purify the blood, while the heart circulates it to the entire body, supplying the cells and tissues with all their nutrient requirements, and taking away their waste products.

- In the lumbar or abdominal region, the spinal column serves as an anchor for the muscles, which hold the gastro-intestinal organs in place: stomach and intestines, liver, spleen, and pancreas, and also, the kidneys and urinary system. These are held suspended, as if in a cloth handbag, with the spine forming the handle.

- At the lower (sacral) end of the spine is the pelvis, which is like a bony basket or cavity cradling the excretory and reproductive organs. Here the fertilized human egg is nurtured in the mother's womb, like a bird's egg in its nest.

• Like the main branches of this tree, the upper and the lower limbs shoot out from this central trunk, with the nearer joints (the shoulder and the hip) having a full range of movements in all the three planes, like a ball and socket, while the distal joints (the elbow and the knee) can move in only one plane, like a door on a hinge.

Thus, we find that the spine is not absolutely erect in the true sense of the word, but has four distinct curvatures.

FOUR CURVES

The cervical curvature in the neck has seven vertebrae. The dorsal in the chest has twelve and the lumbar in the lower back has five. Like a stack of coins, these bear the progressively increasing weight of the column above. Thus, each vertebra is slightly larger than the one above, as we descend from the neck to the buttocks. The atlas is only ¼ as large or heavy as the last lumbar vertebra. In Sirshasana, (headstand posture) one should bear the weight of the entire body on the triangle formed by the head and the two elbows. If too much weight falls onto the cervical vertebrae alone, they will suffer damage, as they are meant to carry the weight of the head only, and not that of the whole body.

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The sacral vertebrae (five in number) are fused to form a single bone at the back of the pelvis. These are smaller as they have no weight-bearing function and take no part in the movements of the spine described above. The coccyx is the vestige of the tail. The tail is used by lower animals for warding off troubling insects, for holding onto a branch and for balance while jumping. A man can perform these functions with his upper limbs. It is also used for expressing emotions like anger and fright. Human beings have evolved better ways of expressing emotions, and man had lost his tail during evolution.

THE HUMAN SPINE

The human spine is not a single bone, nor is it like a bamboo. It is like a string of beads; but instead of the string holding the beads together, as in a Japa Mala, it is the beads (the vertebrae) that protect the string (the spinal cord) inside. The spine is made this way because it has to perform so many movements. It bends forwards and backwards and sideways and also twists up on itself – hence, the string of beads.

There is a degenerative condition called bamboo spine (ankylosing spondylitis), where the spine really becomes like a bamboo (and looks like one on X-ray). Just imagine the miseries of that person – stiff like a bamboo. Between two beads, there is a resilient disc, or pad, to absorb shocks while walking, running, jumping, or even while standing and sitting. Thus, wear and tear on the bones is lessened and the brain and internal organs are cushioned. The delicate string of the spinal cord runs through the central vertebral canal, and numerous nerve branches emerge from it and pass through the gaps between the vertebrae.

THE ROLE OF YOGA

Now, let us see what afflictions the spine can have and the role of Yoga in prevention and cure of some of them. At the outset, it should be clear that where the bone tissue of the vertebrae itself is seriously diseased, or has been destroyed by a disease, like tuberculosis, cancer, or a serious injury, the lost bony structures cannot be restored by Yoga.

•Yoga helps maintain and restore the auxiliary structures, like the ligaments which hold the vertebrae together, the joints, and the shock-absorbers in between, and the para-vertebral muscles on either side of the vertebrae.

• Yoga also helps in aligning the curvatures of the spine, maintaining the full range of spinal movements and flexibility, and relieving pressure on the nerves emerging between two vertebrae.

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- All the Yogasanas have some action on the spine, in addition to their other individual actions and applications. The backward bending, forward bending, and sideward bending Asanas have obvious actions on the spine. Even the balancing Asanas, and sitting postures, help to maintain the para-vertebral musculature.

- Matsyendrasana, and its variation Ardha- matsyendrasana, are the only two Asanas which give a complete rotatory movement to the entire vertebral column; the locked position of the leg, and the arm, acts as a fulcrum for the twist.

- The natural curvature of the spine in the neck region is backwards, but most of our time is spent working with our heads bent forwards. Hence we get degenerative diseases, like cervical spondylolysis. These spinal diseases are prevented and also cured by giving extension to the neck. The orthopaedic surgeons manage it by supplying a supporting collar, or by confining the patient to bed and applying traction on the neck, like a man being hanged. Yoga effectively arrests and alleviates the condition by simple postures, including Pawanmuktasana, Bhujangasana, Vajrasana, Shashankasana, Dwikonasana, Ardha- matsyendrasana, and allied backward bending Asanas.

- The second malady in this region, which is relieved by Yoga, is a tension headache. Due to mental and postural tensions, the muscles at the back of the head and neck become tightened and spasmed (they can be felt as hard tender cords and knots). This causes an ache at the back of the head. Asanas, such as flexibility and neck exercises, involving free movements of the neck, release the tension load in the neck muscles, while Yoga-nidra and Shavasana reduce the levels of psychic and mental tensions. This double-pronged attack on the disease, using somatopsychic and psychosomatic techniques, proves most effective. Tensions in the mind and spasms in the muscles disappear reciprocally. Just as mental tensions lead to muscle spasm, so also by lessening the spasms in the muscles, one can relieve the mind of some of its tensions.

- In the thoracic (chest) region, the spine is bent forward; and if it is excessively bent, congestion of the thoracic nerves, and crowding of the rib cage, result. This reduces the space in which the lungs can expand and respiratory efficiency diminishes. Stooped shoulders and hunched back occur in asthma and chronic bronchitis. These deformities can be removed by practicing Dhanurasana, Chakrasana, Bhujangasana, Matsyasana, and the like. At the same time, the efficiency of the respiratory system increases and the symptoms of respiratory disease diminish.

- The most troublesome area of the spine is the lumbar (lower back) region. Its problems are manifold. The para-vertebral muscles become stiff and painful with build-up of emotional, sexual, and menstrual tensions. They sprain by uncoordinated actions while lifting, bending, or driving. Spinal ligaments are torn by hard pulls or blow received during sports, etc. The muscles are imbalanced if the body weight is not equally divided between both legs due to some disease in the lower limbs. In slipped

disc, the cartilaginous ring of one of the shock-absorbing spinal discs ruptures, due to wear and tear, and its nucleus pulpous (the jelly-like substance in the middle of the spinal disc) may pop out and press on a nerve-root, leading to sciatic pain in one or both legs. The most common cause of low back pain is due to bad posture. We are not able to stand or sit properly, due to weakened muscles, lack of exercise, and sedentary life.

- One also suffers from causes in front, when the abdomen becomes obese, flabby, and distended. The lumbar spine acts like the handle of a bag holding the contents of the abdomen. In obesity, the contents of the bag become heavy, due to deposition of extra fat in the mesentery of the intestines. Mesentery is the supporting structure that straps the intestines to the spine. In an obese person, mesentery is one of the major depots of extra fat. The abdominal muscles support the contents in the bag from in front. If they are weak and flabby, the intestines fall forward, causing a pull on the vertebrae behind. This also leads to backache. Excess fat deposition in the abdominal wall also causes a pull on the lumbar vertebrae. In women, if the uterus is not properly placed (retroversion), or if it has adhesions, low back pain may result. Pelvic infections are another cause.

- Major organic diseases of the bones of the vertebral column, such as tuberculosis, cancer, and osteomyelitis are rare causes of spinal pain. There are many other common causes of pain in the spine, which can definitely be successfully managed and corrected by Yoga techniques.

- The forward, backward, and sideward bending Asanas, mobilize the inter-vertebral joints, develop the supporting musculature of the spine, strengthen the ligaments, and massage the nerves and blood vessels. These are essential if proper spinal health is to be maintained, especially in middle and later life. Because this development and maintenance occurs equally on each side, the possibility of unequal tensions on the spine is reduced. In the so-called ‘slipped disc syndrome’, including sciatica, the backward bending Asanas of the lower spine, e.g. Shalabhasana, Ushtrasana, Dhanurasana, and Bhujangasana are akin to the extension exercises given by the physiotherapist. Shavasana relaxes the entire musculature. Tadasana stretches the spinal ligaments, relieves pressure on the inter-vertebral discs, and lessens wear and tear. Similarly, the inverted Asanas (Sirshasana, Sarvangasana, Vipareet karani mudra) change the pressure points, where the body weight is brought to bear on the lumbar vertebrae. This reduces strain on the lower back. Bhastrika pranayama, Uddiyana bandha, Agnisar, and Nauli Kriya develop the abdominal musculature, remove obesity, and resulting spinal strain.

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LEARN RELAXING IN A STANDING POSITION WITH CORRECTLY ALIGNED POSITION

- Bring the feet a few inches apart (10 cm) and parallel to each other. Then bring the awareness into the soles of the feet, and gently rock backwards and forwards, coming up onto the toes and back onto the heels. Then, return to a standstill position and feel the contact with the floor through both feet. The body sways, and the weight moves forwards and back and left and right quite naturally. Be grounded through the feet, and allow them to take the weight evenly.

- Make sure that the knees are unlocked and pull up the kneecaps. If they point in towards the center, then rotate the thighs outwards, and tighten the buttocks.

The following exercise can also be practiced in sitting posture.

- Now, tilt the pelvis backwards and forwards, finding the balance so that the spine can grow comfortably upwards out of the hips.

- Bring the shoulders up and back, and let them go wide, with the arms hanging loosely.

- Hold the head and neck upright, so that the ears are above the tops of the shoulders, and the head feels lightly balanced on top of the neck.

- Imagine that a string is attached to the top of the head and that someone is lifting the head up and out of the shoulders. Feel how your posture alters when you ‘let go’ of this imaginary string.

In fact, over 80% of all cases of backache can be prevented, or alleviated, by the correct application of simple Yogic methods.

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AUM SHANTI

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Dr. Rita Khanna is a well-known name in the field of Yoga and Naturopathy. She was initiated into this discipline over 25 years ago by world famous Swami Adyatmananda of Sivananda Ashram in Rishikesh (India).

She believes firmly that Yoga is a scientific process, which helps us to lead a healthy and disease-free life. She is also actively involved in practicing alternative medicines like Naturopathy. Over the years, she has been successfully practicing these therapies and providing succour to several chronic and terminally ill patients through Yoga, Diet and Naturopathy. She is also imparting Yoga Teachers Training.

At present, Dr. Rita Khanna is running a Yoga Studio in Secunderabad (Hyderabad, India).