Digital Lifestyle Disorders and The Cervical Spine: An Anatomical and Ayurvedic Review of Greeva Stambha

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***Abstract*— "Tech Neck Pain" is becoming a global disability. This public health problem has increased remarkably since the past decade. To better understand the physiology and anatomy of human postures related to neck pain the posture, age, and other associated conditions are considered. According to *Ayurveda*, cervical disorders resemble *Greeva Stambha,* which essentially is a disorder caused due to vitiation of *Vata*. *Vata* in human body is responsible for various movements. This review article provides a complete review of basic literature about *Greeva Stambha* available in *Ayurveda* and modern sciences and attempts to correlate them to discover better understandings of anatomy and physiology of the disease. Various online databases, google scholar, published review articles, PubMed, National Library of Medicine, Samhitas have been referred to conduct the review. This paper review more than 20 different sources and has clearly defined that the use of digital smart devices is becoming new cause for manifestation of various disorders. The paper concludes with the discussion of anatomy, biomechanics, clinical evidences, *Ayurvedic* aspect, management through modern and *Ayurvedic* approaches and essential dietary and lifestyle changes.**

***Index Terms*—Cervical Spondylosis, Tech Neck Syndrome, Text Neck, *Greeva Stambha*, Cervical Pain, Screen addiction, *Vata Vyadhi*.**

I. INTRODUCTION

The persuasive use of digital devices – smartphones, laptops, tablets etc. has transformed modern daily life but also introduced new musculoskeletal challenges. Currently cervical spine disorders, especially Tech Neck, have become increasingly common. People who are spending prolonged time using screen often develop forward head posture (FHP), neck stiffness and impaired mobility. Cervical spine disorders often refer to musculoskeletal, anatomical, and degenerative changes in the normal biomechanics of cervical spine. These abnormal changes when arise due to postural changes associated to prolonged use of digital devices are referred as Tech Neck Syndrome (TNS).[1] The infrahyoid muscle contracts to depress the mandible bone when the chewing muscles pull the mandible bone to help the mouth close, which is how FHP is defined. retract the mandible posteriorly. An increase in the strain on the cervical spine and alterations in the length and strength of the neck muscles have been linked to FHP.[2] Neck stiffness is defined as a sensation of tightness in the neck when attempting to move head to side, especially after a period of inactivity and strain.[3] The TNS is considered as "Pain of Modern Era:..[4] Other associated symptoms accompanying FHP are shoulder tightness, headaches, computer vision syndrome (experiencing eye discomfort and vision problems due to extended screen time), jaw pain, and pain down the arm and forearm, forward shifting of tragus of year in relation to shoulder's coronal level.[5]

Greeva Stambha – a *Vataj* disease correlated with cervical spondylosis known as a degenerative disease of cervical spine. Word *Greeva Stambha* is composed of two words – *Greeva* means Neck[6] and *Stambha* means Stiffness or restriction in movement[7] that signifies the common feature observed in TNS. Particularly relating to musculoskeletal problems like *Stambha, Shoola* and other illnesses. Classical texts attributes *Greeva Stambha* to imbalance of *vata* (and *kapha*), affecting *Asthi, Mamsa and Majja dhatu*. However, the integration between modern anatomical, physiological understandings and *Ayurvedic* pathogenesis and Management is limited.[8]

Epidemiological data indicates that 73% of college students and 64.7% of people who work from home have neck pain or pain in the back.[9,10] Photogrammetry data confirms the subjection to more forward head

posture while using mobile screens in relation to neutral posture, angle and gender.[11]
Management of TNS in modern involves application of heat or cold, Over the counter pain relief, physical therapy, and ergonomic adjustments.

II. METHODOLOGY

- Data Sources: -

Databases search included PubMed, Google Scholar, Scopus, classical *Ayurvedic* literature such as *Charak Samhita, Sushruta Samhita, Ashtanga Hridaya*, AYUSH journals for traditional accounts.

- Search Terms: -

Cervical Spine, Forward head posture, Screen addiction, Tech Nek, Greevastambha, Manyastambha, Ayurvedic Management of Cervical stiffness.

- Inclusion Criteria: -

Clinical or observational studies published in English in the last 10 years dealing with cervical posture or stiffness related to digital device use; Ayurvedic text descriptions or clinical studies of Greeva Stambha or analogous entities; management/treatment studies.

- Exclusion Criteria: -

Studies lacking methodological detail; non-human studies unless directly relevant; articles without English abstracts.

- Data synthesis: -

Key information (anatomy, etiology, symptomatology, interventions, outcomes) was extracted, compared across modern and *Ayurvedic* frameworks. Critical comparison made of similarities, differences, gaps.

III. DISCUSSION

1) Anatomy and Biomechanics of Cervical Spine

The vertebral column is a set of 33 bones mainly divided into 5 regions based on curvature and morphology: Cervical, Thoracic, Lumbar, Sacral and Coccygeal.[12]
The cervical portion of the vertebral column contains 7 articulating vertebrae. These are divided into two major segments: i) Cephalad vertebrae that is atlas (C1) and axis (C2), ii) caudad vertebrae that is C3-C7. The cervical spine is directly responsible to support the weight of the cranium and head and neck motion.[12] Intervertebral discs (except C1-C2) provides cushioning and flexibility. The arterial supply is drawn from Vertebral arteries (that are branches of subclavian artery), ascending cervical artery (branch of inferior thyroid artery), and deep cervical artery (branch of Costo cervical trunk). There are internal and external vertebral venous plexuses that drain the venous blood from cervical into vertebral and internal jugular veins.[13]
The range of motion of cervical spine is approximately 80-90 degrees of flexion 70 degrees of extension, 20-45 degrees of lateral flexion, and up to 90 degrees of rotation to the both sides. The uniplanar movement does not define the motion between cervical levels and hence it is complex.[14] Mobility of cervical spine largely includes flexion, extension, and rotation by Atlanto-occipital Joint, Lateral flexion and combined movements though lower cervical joints. The cervical vertebrae also help in maintaining alignment of head over trunk, key for proprioception and gaze stabilization.[15]
Posture is the structural framework of the body intended to resist gravity while human is standing, moving, sitting, by maintain an upright posture. The distortion patterns of the cervical spine are examined and located using the Fist of the four posture quadrants that is known as “cranio-cervical posture”. Forward head posture (FHP) is defined as a postural distortion pattern involving the head, neck, 1st postural quadrant and characterised by protrusion of head in sagittal plane so that it is placed anterior to trunk.[16]

2) Modern clinical evidence of screen induced Cervical stiffness

When a person uses their smartphone excessively, they are forced to adopt a compromised posture. Both the musculoskeletal and postural systems gradually alter as a result. The area of communication and information sharing among people has undergone a significant change as a result of the rise in smartphone usage worldwide[17]. Between 2016 and 2020, the number of smartphone users worldwide rose from 3.6 to 6.5 billion, which is nearly one-third of the planet's total population[18]. a significant problem for global health in the twenty-first century. Over 52 million users a 25-fold rise over the two million users recorded in 2013[18], Iran is the 12th largest smartphone user in the world.

The smartphone has potential applications in many everyday activities, and entertainment[19,20]. Smartphones have the potential to cause addictive behaviour in users because of their portability, light weight, simplicity, and ability to process information quickly[21,22]. "Technological addictions"[23], smartphone addiction is classified as a type of "behavioural addiction." The negative physical and psychological health effects of this pathological addiction, particularly on psychosocial and mental disorders, have been demonstrated by a number of studies.[24,25,26,27]

The most prevalent way to hold a smartphone is with one hand while standing or seated, and use the other to touch the screen. The use of a forward head position (FHP) is a popular but unfavourable posture for smartphone users because the majority of smartphone activities involve neck flexion and the read and touch the screen with your arms stretched out in front of you. The purpose of this posture is to preserve the balance of muscles and the correctness of eyesight. The two most frequent risk factors for musculoskeletal problems in the neck and upper extremities are maintaining a static posture and doing the same activity over and over again.[28] problems with decreased range of motion of the neck and decreased flexibility of muscles.[29,30]

Because smartphones promote a sedentary user posture for prolonged periods of time, there is less muscle movement. The muscle receptors are crucial for detecting joint motion and position perception, which is essential for appropriate voluntary and reflex movements.[31] The neck muscles are situated at the top of the body. Their primary function is proprioception. The intensity of muscle spindles reveals it. Poor posture, like FHP, induces exhaustion in the neck muscles and lowers the intensity of the muscle spindles. the frequency of muscle spindles. Muscle stretching can affect gamma motor neuron activity, which in turn alters neck proprioception.[32,33] The participation of neck endurance, Numerous studies have backed the idea that neck pain is caused by flexibility and proprioception.[34] These variables are assessed, and their contribution to the etiology of neck pain is determined. Due to the prevalence of neck pain among smartphone users, a relationship to the severity of neck discomfort they feel is essential. New information concerning Addiction is the most probable risk factor for smartphone users.[35] To our knowledge, no studies have examined how varying levels of Smartphone dependence has an impact on proprioception, neck muscle flexibility, and endurance. Therefore, the objective of this study was to explore the relationship between smartphone use and these factors. Neck ROM, muscular endurance, neck joint position sense, and addiction.[36]

3) *Ayurvedic* Aspect of Greeva Stambha

Ailment in *Ayurveda* known as *Greeva Stambha* because its main characteristic is the rigidity of the *Acharya Charak's* neck is ideal for Cervical Spondylosis. "*Greeva Stambha*" was the first name given to the illness, among others. the 80 different kinds of *Vata Nanatamaja Vikar*. This ailment is becoming more prevalent. and frequently seen among individuals in middle age. Additionally, it impacts individuals who engage in strenuous physical activity and those with poor frequent travellers are more likely to sustain injuries to their sitting position, and the bones in the neck that cause spondylosis. It is a wear and tear condition and is experienced as neck pain, stiffness, headache, paraesthesia, numbness, vertigo, etc. The pathophysiology, clinical manifestations, and treatment of the illness are discussed in this piece *Ayurvedic* texts have been covered that aid in comprehending the illness.[37]

Nidana: -

As mentioned in *Charak Samhita* the Etiological factors responsible in causing *Vata Vyadhi* are *Ruksha* (Dry), *Sheeta* (Cold), *Alpa* (very less), and *Laghu* (Light), *Ahar* (Diet) for a long time causes *vata* vitiation. Other responsible lifestyle factors such as fasting, swimming, waling, exercising, physical activities, deletion of tissues, worrying, grief, uncomfortable beds or seats, day sleep, suppression of natural urges, indigestion, etc also cause *vata* vitiation.[38]

Purvarupa: -

There is no distinct manifestation of diseases in prodromal stage.[39]

Rupa: -

Vitiated *Vata* causes symptoms like contractures, stiffness, hunching, spasticity, etc at the site of affliction.[40]

Samprapti: -

The pathogenesis of *Greeva stambha* starts with *nidana sevana* leading to aggravation of *vata dosha*. This

vitiated *vata* gets occupied in the *Greeva* region leading to localization of *vata* and *kshaya* (depletion) of *kapha* in *Greeva*. This causes manifestation of symptoms.[41]

4) Management thorough holistic approach

Through Modern Approach: -

Community education both in prevention and in therapeutic approach is of utmost importance. Guiding people about correct postures, proper rehabilitative exercises, self-therapies, movement habits, and sustainable use of smart devices to prevent illness is highly supportive to eradicate such new arising diseases. Spinal stabilization *yoga* and exercises for maintaining proper posture if practiced regularly have good outcome on overall health.[42,43] Various types of therapy can be used, depending on how severe the symptoms are. Rest, hot or cold compresses, massage, stretching, exercises, posture correction, and lifestyle modifications are advised for the acute symptoms of text neck syndrome. Acupuncture, injections, medications, and physical therapy are utilized to treat chronic text neck syndrome symptoms.[44]

Through *Ayurveda*: -

Snehana and *Swedana* are already mentioned to advocated for *Vatavyadhis.* Both helps in nourishment of *dhatus*, improve *agni*, relieve *stambhata* (stiffness), and cause *namiyata* (relaxation) of the body.[45] Appropriate *shodhana* and *shamana chikitsa* shall be given considering *agni*, season, strength of patient body and other factors. *Greeva basti* can have outstanding effects to relieve the symptoms and provide relieve to patient.[46] Vitiated *Vata* is the cause of *Stambha* and *Shoola* (pain and stiffness), which renders patients unable. *Vata* vitiation can be corrected by local application of *Panchaguna Taila* and oral treatment with *Guggulu* preparation. Additionally, *Ushna upachara*, or heat treatment, is provided locally by *Nadisweda*. In all its manifestations, *Snehana Swedana* suppresses *Vata*. The *Ruksha* and *Sheeta gunas* of *Vata* are opposed by the *Snigdha* and *Ushna Gunas* of *Snehana Swedana*.[47]

5) Diet and Lifestyle Modifications for sustainable approach.

Medications with a sweet, sour, or salty flavour should be used to treat the weakened *vata*, along with a variety of oily and heated therapeutic methods like oleation, diet, massage, inhalation, fomentation, effusion, non-unctuous and unctuous enema, unction, etc. The procedures or medications administered should have anti-*vataja* effects and be delivered in the following manner: The proper dosage and timing. Non-unctuous and unctuous enemas are considered to be the most successful methods of treating the conditions listed above. Because enema enters the colon fast and targets the source of the vitiated *vata*, it is effective in treating *vataja vyadhi*. As a result, the vata is conquered. The colon automatically relieves the *vata* imbalances in other parts of the body, just as the tree does when the root is cut off. in the automatic destruction of the trunk, branches, shoots, flowers, fruits, leaves, and other parts.[48]

IV. CONCLUSION

The increasing incidence of cervical stiffness in the digital age points to a critical connection between contemporary lifestyle choices and musculoskeletal health. What could be termed "digital lifestyle disorders" have been greatly caused by excessive screen usage, extended periods of inactivity, and frequent neck bending while using computers and smartphones. Clinical data consistently reveals connections between smartphone addiction, bad cervical posture, and the resulting stiffness, pain, and functional impairment. Because of its distinct anatomy and mobility, the cervical spine is particularly susceptible to neuromuscular imbalance, mechanical stress, and vascular compromise. These biomechanical shifts might result in a lower quality of life, impaired proprioception, and degenerative changes over time, in addition to pain.

Modern anatomical understanding is greatly complemented by *Ayurvedic* viewpoints. *Greeva* is known in classical literature as a crucial area, its relationship to key *Marma* (vital spots), and the expression of *Greeva Stambha* as a Vata-dominant. When exacerbated by an erratic lifestyle, the *ruksha* (dryness), *laghu* (lightness), and *chala* (mobility) characteristics of *vata* align with the clinical presentation of screen-induced cervical stiffness. Stiffness, discomfort, and limited mobility in the cervical area might result from stress and bad posture. This comprehensive understanding connects anatomical pathology with dosha imbalance, establishing an all-encompassing paradigm for both prevention and treatment.

The therapeutic approach must be twofold. *Ayurvedic* interventions like *Abhyanga* (oil massage), postural training, physiotherapy, and cervical muscle strengthening can be synergistically combined with contemporary rehabilitation techniques like ergonomic adjustments. massage), *Svedana* (sudation therapy), *Matrabasti*, and herbal preparations for *Vata* pacification. In addition, yogic techniques that focus on spinal mobility, pranayama for stress management, and mindful screen use rituals can support cervical health. This holistic approach to treatment takes care of both symptomatic relief and long-term structural and functional well-being.

Digital screen addiction, which causes cervical stiffness, is a clinical and socio-behavioural issue of the twenty-first century, to sum up. The most complete path forward is a multidisciplinary strategy that incorporates *Ayurveda's* enduring knowledge with current anatomical accuracy. Policy initiatives should concentrate on promoting digital health literacy, whereas future studies should concentrate on producing strong clinical data that supports *Ayurvedic* treatments for cervical musculoskeletal diseases. early changes to one's lifestyle and ergonomic awareness. In the quickly changing digital world, it is possible to lessen the burden of digital lifestyle illnesses and maintain cervical health by combining modern science with traditional healing practices.

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