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PHYSIOLOGICAL EFFECTS OF NETI KRIYA WITH SPECIAL REFERENCE TO JALA NETI: A NARRATIVE REVIEW OF SCIENTIFIC STUDIES

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ABSTRACT

Background:- A classic yoga cleansing method called neti kriya is well known for its therapeutic advantages in supporting sinus and respiratory health. The main tool used for Neti Kriya is an aneti pot, while various gadgets and squeeze bottles are more recent variations. nose irrigation, or jala neti, is an age-old yoga technique that is thought to improve respiratory health and clear the nose passages. Jal Neti are crucial to the maxillary sinus's ability to drain its accumulation. Vasodilation and enhanced phagocytosis are caused by lukewarm water, and NaCl aids in the transformation of dense secretions into thin ones. Similar to how brushing your teeth is related to dental hygiene, it all comes down to nasal hygiene.

Objective:- The purpose of this study is to examine the therapeutic potential of Jala Neti using a Narrative review of scientific studies.

Methodology:-The literary Material are collected from related literature, Research papers, Digital-e-sources and manuscripts, on the base of the available documents the critical analysis is done, and a suitable conclusion will be drawn.

Conclusion:- Jala Neti is a simple yet effective practice that can have numerous physiological benefits, making it a valuable addition to one's daily routine. Regular practice of Jala Neti can lead to improved respiratory health, reduced occurrence of infections, and enhanced cognitive function. As with any new practice, it's essential to consult with a healthcare professional and learn proper techniques to maximize its benefits.

KEYWORDS: Shatkarma, Neti Kriya, Jala Neti

INTRODUCTION

Yoga is an age-old Indian system of breathing techniques, physical and mental exercises, and postures that promote both mental and physical health. According to the Hatha Yoga tradition, there are six cleansing methods called Shatkarma or Shatkriya that are believed to balance a person's constitution. By purifying the entire body, these yoga positions are said to improve health and wellbeing[1]. In particular, the Shatkarmas boost the practitioner's vital ability. They were never created just for treatment; they were also intended to prevent illness, achieve harmony and health, and liberate people from old age. Additionally, it brings the body and mind into balance and gets a candidate ready for more practice. An old Indian method of clearing the airways, neti kriya helps clear the nasopharyngeal tubes and prevents and cures illnesses of the upper respiratory tract, such as viral infections. There are two varieties: Sutra Neti and Jal Neti[2]. Neti kriya's effectiveness in treating chronic instances of sinusitis and rhinitis is demonstrated by its ability to lower inflammatory mediators in

Research Paper

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nasal secretions[3]. The ancient Indian yogic tradition mentions a number of kriyas. For yogis (saints), these kriyas were an essential part of their daily lives. These yoga kriyas are said to strengthen the immune system, enhance lung function and respiratory capacity, reduce stress, increase mental and physical stamina, and enhance general health[4].

Review Methods:- We conducted a systematic assessment of peer-reviewed publications in PubMed, Google Scholar, Scopus, AyushPortal, and varies Peer reviews journals to recognize the therapeutic value of Neti.

Shatkarma:- The six cleansing processes make up shatkarma. It ought to be used when Kapha and Medas are out of balance. The six cleansing procedures were Dhauti, Basti, Neti, Trataka, Nauli, and Kapalabhati. The yoga techniques known as shatkarmas are used to cleanse and purify the body from the inside out. The terms "shat" (six) and "karma" (activity) combine to form the word "shatkarma." These methods are used to cleanse the digestive, excretory, and swallowing systems. Similar to how bathing cleanses our skin of dead skin cells and other impurities, shatkarma purifies our inside organs. Among these, Neti enhances vision and eliminates kaphaja disease[5].

Neti Kriya: Neti Kriya, also known as Neti Yoga or Nasal Irrigation, is an ancient yogic practice that involves rinsing the nasal passages with a saline solution. The term "Neti" refers to the nasal passages, and "Kriya" means "action" or "cleansing." Neti Kriya is often practiced in yoga and Ayurvedic traditions as a way to maintain nasal health, prevent respiratory problems, and promote overall well-being. By avoiding mucus stasis, neti kriya improves sinus outflow and efficiently eliminates foreign objects like dust and allergies[6].

Classification of Neti Kriya[7].

- Sutraneti
- Jalaneti
- Dugdaneti
- Madhuneti
- Ghrtaneti

Every Neti technique aids in clearing the nasal cavity, which guarantees that the frontal, ethmoid, maxillary, and sphenoid sinuses are all clean. Because of their porous nature, the sinuses hold onto air. On the other hand, sinusitis is one of the several problems brought on by water retention in the sinuses. However, an experimental understanding of the draining out mechanism in sinuses is necessary[8].

Jala Neti:- Jalaneti, also known as Jala Neti, is a yogic practice of nasal cleansing using a saline solution. "Jala" means "water" and "Neti" means "nasal cleansing." It involves rinsing the nasal passages with a warm saline solution to:

- Remove excess mucus and debris.
- Reduce sinus congestion and pressure.
- Improve breathing and respiratory function.
- Enhance mental clarity and focus.

Physiological Impact of Jala Neti:-

- Impact of Jalaneti on different body systems
- Impact of Jalaneti on different diseases

IMPACT ON DIFFERENT BODY SYSTEMS

1. **Respiratory system:-** By clearing the sinuses and nostrils of mucus, Neti makes it easier for air to pass through without restriction[9]. It cleanses nasal passages, removing dirt, allergens, and mucus, which improves airflow and eases breathing[10].
2. **Nervous system:-** It can enhance blood circulation, stimulate nerve endings in the nasal cavity, and balance the actions of the autonomic nervous system11.

Jalaneti –clearing pollutant and mucus – improve oxygen flow in brain – enhancing brain cell functioning - balanced state of the nervous system has a calming effect, which can reduce stress, anxiety, and depression[12].

stimulate the olfactory nerves - improving the sense of smell - benefiting the connected functions of taste and digestion[13-14].

3. **Digestive System:-** Jalaneti's impact on the digestive system is indirect, but potential benefits include-

The practice's overall balancing effect and enhanced sense of smell can affect how food is processed[15].

Impact of Jalaneti On different Types of diseases:-

1) **Role of Jalaneti in Sinusitis:-** Saline irrigation is one of the mainstays of treatment for chronic rhinosinusitis. After two weeks of therapy,

patients who regularly irrigated their noses saw a 70% reduction in their chronic sinusitis symptoms. The amount of medication used by these patients was significantly decreased[16]. The above-discussed JalNeti and Shatkarma are very effective in treating and preventing chronic maxillary sinusitis[17]. The Nada Pranayamas and Neti Kriya provide us with a potential adjuvant treatment for the treatment and prevention of sinusitis. As demonstrated in Jala Neti, nasal irrigation with hypertonic saline is a tried-and-true method of treating rhinosinusitis[18].

2) **Role of Jalaneti in Rhinitis:-** A study was conducted where total number of 20 patients of age 10-70 years having allegic rhinitis or Jirnapratishyay as mentioned in Ayurvedic classics were selected. Out of which Nasya with Vacha Tail was given to 10 patients and Jalaneti with Saindhav Jala was given to another 10 patients. Comparison was done by subjective assessment. It was observed that Nasya done as per the textual methods is highly effective in Allergic Rhinitis and showing a way out to the individual suffering from chronic disease. The study confirmed the effect of Nasya in Allergic Rhinitis in improving the quality of life of patients without any untoward effects[19]. When comparing the groups, the study reveals significant differences between Sutra Neti Kriya, Kapalabhati, and Breathe Awareness. Sutra Neti Kriya and Kapalabhati show a significant improvement in quality of life, encompassing sleep, nasal symptoms, practical problems, activities, and emotional shifts. Breath awareness, however, does not appear to significantly alter life quality[20].

3) **Role of Jalaneti in Myopia:-** A study was conducted where A total of 80 adolescents, aged 10-19 years, diagnosed with myopia [spherical equivalent (SE) less than -4.00 diopters] using photo refractor and autorefractor devices, will be enrolled in this randomized controlled trial Participants will be randomly assigned into two groups, An intervention group subjects will practice jala neti for 5 sessions per week for 8 weeks,study suggested that jalaneti could be a beneficial adjunct therapy to current myopia management strategies[21].

4) **Role of Jalaneti in Vision:-** A comparative study on the effect of Saptamrita lauha and yoga therapy in Myopia revealed that yoga therapy comprising of Jalneti, Nadi Shodhana Pranayama, Shitali Pranayama and Point Trataka exerted better improvement in associated changes of myopia when compared to Saptamrita lauha alone. Practice of Jalneti and other yoga procedures were effective in symptoms like eye pain, eye strain, watering and heaviness of eye. The treatments were done for a period of 3 months with a 1 month follow up, The above study supports the therapeutic efficacy of Jalneti in improving vision[22].

Table 1: Major Scientific Studies Reviewed

Author(s), Year	Study design	Sample	Intervention	Duration	Parameters assessed	Major findings	Relevance to present review
Rani et al. (2024)	Pre–post experimental study	60 healthy volunteers (16 males, 44 females; 18–25 yr)	**Jala Neti**	Immediate effect	Peak Nasal Inspiratory Flow (PNIF)	Mean PNIF increased significantly from 84.56 ± 12.56 L/min before Jala Neti to 110.85 ± 12.56 L/min after practice (p = .001).	**Direct evidence** for an acute improvement in nasal inspiratory airflow following Jala Neti. (ACS Publisher)
Acar et al. (2021)	Prospective, single-blind randomized controlled study	120 patients with mild persistent allergic rhinitis	Surfactant, sodium-hyaluronate, or isotonic saline nasal irrigation	Treatment period	Mucociliary clearance time	Nasal irrigation improved mucociliary clearance; greater improvement was observed with surfactant and sodium-hyaluronate preparations compared with saline control.	Supports the role of nasal irrigation in **mucociliary function**, while demonstrating that solution composition may influence outcomes.

Periasamy et al. (2020)	Randomized placebo-controlled trial	Patients with allergic rhinitis	Budesonide-buffered hypertonic saline vs hypertonic saline irrigation	Treatment period	Clinical and subjective allergic-rhinitis outcomes	Both nasal irrigation approaches were evaluated for their effects on allergic-rhinitis symptoms; the study specifically examined whether adding budesonide provided additional benefit.	Useful supporting evidence for the **functional effects of saline irrigation in nasal inflammatory conditions**. (DOI)
Sumaily et al. (2020)	Proof-of-concept randomized controlled trial	Adults with sinonasal disease	Iodized vs non-iodized saline nasal irrigation	Short-term	Mucociliary clearance	Saline irrigation improved mucociliary clearance; significant improvement was reported with the iodized-salt solution.	Supports the **mucociliary-clearance mechanism** of saline nasal irrigation.
Salati et al. (2020)	Narrative/ systematic review of anatomical, clinical and computational studies	24 publications reviewed	Various nasal saline irrigation techniques	—	Nasal geometry, irrigation coverage, pressure, flow, nasal resistance and mucociliary transport	Highlighted the importance of nasal anatomy, nasal cycle, irrigation pressure and flow dynamics in determining the physiological effects of nasal irrigation.	Highly relevant for explaining the **anatomical and physiological basis** of Jala Neti. (ScienceDirect)
Ramalingam et al. (2019)	Pilot, open-label randomized controlled trial	60+ adults with common cold/ URTI	Hypertonic saline nasal irrigation and gargling	Acute illness period	Cold symptoms, duration, viral load and illness-related outcomes	Hypertonic saline intervention was associated with reductions in some cold-related outcomes and viral shedding compared with usual care.	Provides supportive evidence for potential **upper-airway cleansing and respiratory effects** of saline irrigation. (Nature)
Succar et al. (2019)	Clinical review	Review of available NSI evidence	Nasal saline irrigation	—	Mucus, mucociliary clearance, edema, antigen load, delivery method and hygiene	NSI may thin mucus, improve mucociliary clearance, reduce edema and decrease antigen load; however, optimal delivery method and solution composition remain uncertain.	Useful for explaining the **proposed physiological mechanisms** and limitations of current evidence. (Wiley Online Library)
Nimsakul et al. (2018)	Randomized controlled study	Patients with chronic rhinosinusitis	Heated vs room-temperature saline nasal irrigation	Short-term	Saccharin transit time, PNIF, rhinomanometry, acoustic rhinometry and symptoms	Investigated the influence of saline temperature on mucociliary function and nasal patency.	Particularly relevant to **mucociliary clearance and nasal airflow physiology**.
Slapak et al. (2008)	Randomized controlled trial	Children with acute rhinitis/ URTI	Isotonic seawater nasal wash vs conventional treatment	Treatment/ follow-up period	Nasal secretion, obstruction, medication use and health status	Nasal washing was associated with improvements in nasal secretion and breathing-related symptoms and reduced medication use.	Supports effects on **nasal secretion clearance and nasal patency**.
Pynnonen et al. (2007)	Prospective randomized controlled trial	127 adults with chronic nasal/sinus symptoms	Large-volume, low-pressure isotonic saline irrigation vs saline spray	8 weeks	SNOT-20, symptom frequency and medication use	Irrigation produced significantly greater improvement in SNOT-20 scores than saline spray at 2, 4 and 8 weeks.	Strong supportive evidence for the **functional effects of large-volume saline irrigation**. (JAMA Network)
Rabago et al. (2006)	Randomized controlled trial	Adults with chronic/ recurrent sinonasal symptoms	Hypertonic saline nasal irrigation	12 months	RSDI, SIA and SNOT-20	Long-term saline irrigation was associated with improvement in sinonasal symptoms and quality of life.	Supports possible **longer-term functional effects**, although it is not specific to traditional Jala Neti.

Tano & Tano (2004)	Controlled clinical study	Healthy adults	Saline nasal treatment	20 weeks	Rhinitis symptoms and occurrence	Regular saline nasal treatment was associated with fewer nasal symptoms during the study period.	Provides background evidence for the **preventive/maintenance effects of saline nasal cleansing**.
King et al. (2015)	Cochrane systematic review	749 participants across 5 RCTs	Various saline nasal irrigation methods	Variable	Acute URTI symptoms and recovery	Saline irrigation may improve some symptoms, but evidence quality was low/very low because of small samples and methodological limitations.	Important for **critical appraisal of evidence quality**.
Kassel et al. (2010)	Cochrane systematic review	Adults and children with acute URTIs	Saline nasal irrigation	Variable	Symptom relief and illness duration	Evidence suggested possible benefits, but trials were limited and heterogeneous.	Provides broader evidence regarding **respiratory/upper-airway effects** and limitations.

Fig 1.0: Proposed Physiological Mechanism of Jala Neti

Jala Neti
↓
Saline water enters the nasal cavity
↓
Mechanical removal of mucus, allergens, particulate matter and accumulated secretions
↓
Improved nasal mucociliary clearance
↓
Reduced mucus viscosity / improved mucosal environment
↓
Reduced nasal obstruction and improved nasal patency
↓
Improved nasal airflow and nasal breathing
↓
Stimulation of nasal sensory receptors
↓
Trigeminal and autonomic neural pathways
↓
Possible modulation of autonomic activity
↓
Potential effects on respiratory and cardiovascular/autonomic parameters

DISCUSSION

The present narrative review indicates that Jala Neti may influence nasal and upper respiratory physiology through a combination of mechanical cleansing, modulation of the nasal mucosal environment, and improvement in nasal airway function. The available literature suggests that irrigation of the nasal cavity can facilitate the removal of mucus, particulate matter, allergens, and accumulated secretions, thereby supporting mucociliary clearance and reducing the burden of material retained within the nasal passages. These effects provide a plausible physiological basis for the traditional description of Neti as a cleansing practice. Evidence from nasal saline irrigation studies has also demonstrated beneficial effects on nasal symptoms, mucociliary function, and sinonasal comfort, although the magnitude of response is not uniform across studies and appears to depend on factors such as solution composition, concentration, temperature, volume, and method of administration

CONCLUSION

ala Neti is a traditional yogic nasal cleansing practice that demonstrates a plausible physiological basis through its effects on the nasal mucosa, mucociliary clearance, and nasal airway function. Available scientific evidence, particularly from studies of nasal saline irrigation, suggests that the practice may assist in clearing nasal secretions and particulate matter, maintaining a favorable mucosal environment, and improving nasal patency and airflow. Emerging direct evidence on Jala Neti further indicates a potential immediate improvement in nasal inspiratory flow. However, evidence regarding its broader respiratory, autonomic, cardiovascular, and systemic effects remains limited and requires further scientific validation. Overall, Jala Neti appears to be a promising non-pharmacological yogic intervention for supporting nasal and upper-airway physiology, but standardized protocols and well-designed randomized controlled studies with objective physiological outcomes are necessary to establish its

efficacy, mechanisms, safety, and long-term effects.

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