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Review Article

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"CONCEPT OF OJAS AND PSYCHONEUROIMMUNOLOGY: LINKING OJAKSHAYA TO STRESS-INDUCED IMMUNE DYSREGULATION"

Dr. Jalpa Gandhi[1]

AFFILIATIONS:
1. CEO, Ira Consultancy & Research Organisation, Bhosari, Pune, Maharashtra 411026

CORRESPONDENCE:
Dr. Jalpa Gandhi
EMAIL ID: ceo@icro.co.in

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ABSTRACT:

Background: Ojas is described in Ayurveda as the essence of all tissues and the basis of strength, immunity and mental stability. Classical texts state that grief, anxiety, anger and fear deplete Ojas. Psychoneuroimmunology (PNI), the study of interactions between the mind, nervous system and immune system, has shown that psychological stress alters immune function and that inflammation contributes to depression. **Objective:** To compare the classical concept of Ojas and its disorders with current PNI evidence, and to identify testable hypotheses for research. **Methods:** Narrative review of the Brihattrayi (Charaka, Sushruta and Ashtanga Hridaya) and of selected PNI literature, including meta-analyses on stress, immunity and inflammation in depression, and studies of Rasayana drugs on stress markers. **Results:** Classical texts describe three grades of Ojas disorder: Visramsa (displacement), Vyapat (vitiation) and Kshaya (depletion), with symptoms that include fear, weakness, anxiety, loss of clarity and susceptibility to disease. Psychological causes are listed explicitly. Modern evidence shows that chronic stress suppresses cellular and humoral immunity, slows wound healing and increases susceptibility to infection, while major depression is associated with raised interleukin-6 and tumour necrosis factor alpha. Rasayana drugs such as Ashwagandha reduce perceived stress and serum cortisol in controlled trials. **Conclusion:** Ojakshaya shows strong conceptual parallels with stress-induced immune dysregulation. Ojas should not be equated with any single molecule, but its clinical descriptions can be operationalised through composite markers of immune, endocrine and psychological status for testing in clinical studies.

Keywords: Ojas; Ojakshaya; Vyadhikshamatva; psychoneuroimmunology; stress; inflammation; Rasayana

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INTRODUCTION:

The idea that the mind affects bodily resistance to disease is very old in Ayurveda. Charaka lists mental factors such as grief, worry and anger among the causes of Ojas depletion, and describes Ojas as the substance whose presence sustains life and whose loss leads to death[1]. Immunity, in the Ayurvedic sense of Vyadhikshamatva (resistance to disease), is closely tied to Ojas and to Bala (strength)[1,2].

In modern medicine, the formal study of mind–immune interactions began in the 1970s, when Ader and Cohen showed that immune suppression could be behaviourally conditioned in rats[3]. Since then, psychoneuroimmunology has grown into a large field. It has demonstrated that psychological stress changes immune function through the hypothalamic–pituitary–adrenal (HPA) axis and the sympathetic nervous system, and that inflammatory signals from the immune system act on the brain to produce sickness behaviour and depressive symptoms [4–6].

These two bodies of knowledge describe overlapping phenomena in different languages. This review sets out the classical description of Ojas and its disorders, summarises key PNI findings, and examines where the parallels are strong, where they are weak, and how they can be tested.

METHODS:

Classical descriptions of Ojas were collected from the Charaka Samhita, Sushruta Samhita and Ashtanga Hridaya, using standard editions with English translation[1,2,7]. Modern literature on PNI was identified through PubMed and Google Scholar using the terms psychoneuroimmunology, psychological stress, immune function, cytokines, depression and inflammation. Priority was given to meta-analyses and landmark studies. Ayurveda literature on Ojas, Vyadhikshamatva and Rasayana was identified through Google Scholar, DOAJ and the AYUSH Research Portal. This is a narrative review; no formal quality scoring was applied.

Ojas in classical texts

Nature and location

Charaka describes Ojas as residing in the heart (Hridaya), white with a slightly reddish-yellow tinge, with the taste of ghee and the smell of fried paddy[1]. It is compared to honey collected by bees from many flowers: just as honey is the essence of flowers, Ojas is the essence of all tissues. Two types are described: Para Ojas, present in very small quantity (eight drops) in the heart, whose loss causes death; and Apara Ojas, of half an Anjali in quantity, which circulates through the body and whose variations affect health[1].

Sushruta describes Ojas as the final essence of the tissues from Rasa to Shukra, and calls it Bala (strength)[2]. He lists its functions as giving firmness and growth to the muscles, enabling all actions, and giving clarity of voice and complexion. Ashtanga Hridaya also associates Ojas with life, strength and the functioning of the sense organs [7].

Properties of Ojas

Ojas is described as having ten qualities: heavy (Guru), cold (Shita), soft (Mridu), smooth (Shlakshna), dense (Bahala), sweet (Madhura), stable (Sthira), clear (Prasanna), slimy (Picchila) and unctuous (Snigdha) [1]. These qualities are the opposite of those of alcohol (Madya) and poison (Visha), which is why both are said to destroy Ojas. They also match the qualities of Kapha in its healthy state, and several commentators link healthy Kapha with Bala and Ojas.

Causes of Ojakshaya

Charaka lists the causes of Ojas depletion as: excessive physical exercise, fasting, anxiety (Chinta), intake of dry, scanty or poor-quality food, exposure to wind and sun, fear (Bhaya), grief (Shoka), dryness-producing drinks, excessive wakefulness, excessive elimination of Kapha, blood, semen and other excreta, old age, and injury [1]. Anger (Krodha) is also mentioned. Of these, at least four (anxiety, fear, grief, anger) are psychological, and sleep deprivation is a behavioural factor with strong psychological links.

Grades of Ojas disorder

Table 1: Sushruta describes three progressive disorders of Ojas [2]:

Grade	Name	Main features described
1	Ojo Visramsa (displacement)	Looseness of joints, weakness of the body, displacement of the Doshas from their seats, impaired function of body and speech
2	Ojo Vyapat (vitiation)	Stiffness and heaviness of the body, oedema due to Vata, discolouration, fatigue, drowsiness, excessive sleep
3	Ojakshaya (depletion)	Fainting, wasting of muscles, delusion, delirium, and in severe cases death

Charaka describes the features of Ojakshaya as: the person becomes fearful, weak, worries constantly, has impaired sense organs, loss of complexion, mental dullness (Durmana), roughness and emaciation[1]. Several of these symptoms (fear, persistent worry, low mood, fatigue) overlap with modern descriptions of anxiety and depressive states.

Ojas and Vyadhikshamatva

Chakrapani, commenting on Charaka, defines Vyadhikshamatva as the capacity to resist the strength of a disease and to prevent its onset[1]. This resistance depends on Bala, which depends in turn on Ojas. Charaka also lists the factors that determine whether a body is resistant or susceptible to disease, including body build, diet, mental strength (Sattva) and lifestyle. A recent review of Ayurvedic immunological concepts concluded that Ayurveda contains a coherent theory of immunity built around Vyadhikshamatva, Ojas and Bala, rather than borrowing from modern immunology[8].

KEY FINDINGS IN PSYCHONEUROIMMUNOLOGY:

Stress suppresses immune function

The most comprehensive synthesis of human stress–immune studies is the meta-analysis by Segerstrom and Miller, which pooled about 300 studies over 30 years[4]. Acute, time-limited stressors were associated with an upregulation of natural immunity, which can be seen as preparation for injury. In contrast, chronic stressors, such as long-term caregiving or unemployment, were associated with suppression of both cellular and humoral immunity. The effects were larger in older people and in people already ill.

Clinical consequences

Stress-related immune changes have clinical effects. In a prospective study of healthy volunteers deliberately exposed to respiratory viruses, the risk of infection and of clinical colds increased in a dose–response manner with psychological stress [9]. In another landmark study, caregivers of relatives with dementia took significantly longer than matched controls to heal a standard skin wound[10]. Reviews of this literature conclude that stress-induced immune dysfunction is large enough to affect infection risk, vaccine response and wound healing[5].

Inflammation and depression

The relationship is bidirectional. Pro-inflammatory cytokines act on the brain to produce sickness behaviour: fatigue, low mood, reduced appetite, social withdrawal and sleep change[6]. A meta-analysis of studies comparing patients with major depression and controls found significantly higher concentrations of interleukin-6 and tumour necrosis factor alpha in depressed patients[11]. Miller and Raison have argued that inflammation-linked depression may be an evolutionary carry-over of the body's response to infection and injury, and that it identifies a subgroup of patients who may respond to anti-inflammatory strategies[12].

Pathways:

Two main pathways link the brain and immune system. Through the HPA axis, stress raises cortisol, which in the short term suppresses inflammation but, with chronic exposure, leads to glucocorticoid resistance and unchecked inflammation. Through the sympathetic nervous system, noradrenaline acts directly on immune cells in lymphoid organs. Inflammatory signals in turn reach the brain through the vagus nerve, active transport across the blood–brain barrier, and activation of brain endothelial cells and microglia[5,6].

Parallels between Ojakshaya and stress-induced immune dysregulation

CAUSES:

Classical causes of Ojakshaya include anxiety, fear, grief, anger, sleep deprivation, excessive exercise and poor nutrition[1]. Each of these is recognised in modern research as a factor that activates the HPA axis and the sympathetic system, or that impairs immune function directly. The match is strongest for psychological causes and for sleep loss.

SYMPTOMS:

Charaka's description of Ojakshaya (fear, weakness, persistent worry, mental dullness, impaired senses, loss of complexion) resembles the combined picture of chronic stress, sickness behaviour and depressive symptoms seen in PNI studies[1,6]. Sushruta's progression from Visramsa to Kshaya parallels the modern idea that acute stress produces reversible changes, while chronic stress produces sustained immune suppression and, eventually, clinical illness[2,4].

Susceptibility to disease

Both systems link depletion to increased vulnerability. Ayurveda says a person with depleted Ojas falls ill easily and recovers slowly. PNI shows that chronic stress increases infection risk and slows healing[9,10]. Both systems also note greater vulnerability with age, which in Ayurveda is listed as a cause of Ojakshaya and in PNI is identified as a moderator of stress–immune effects[1,4].

Table 2: Summary of parallels

Domain	Ayurvedic description	PNI finding	Strength of parallel
Psychological causes	Chinta, Bhaya, Shoka, Krodha deplete Ojas[1]	Chronic stress suppresses immunity[4]	Strong
Sleep	Excessive wakefulness depletes Ojas[1]	Sleep loss impairs immune function	Strong
Symptoms	Fear, weakness, worry, dullness[1]	Sickness behaviour, depression with raised cytokines[6,11]	Moderate
Progression	Visramsa → Vyapat → Kshaya[2]	Acute → chronic stress effects[4]	Moderate
Vulnerability	Easy illness, slow recovery	Higher infection risk, slower wound healing [9,10]	Strong
Substance	Ojas as a material essence in the heart[1]	No single equivalent molecule	Weak

RASAYANA AND THE RESTORATION OF OJAS:

Ayurveda prescribes Rasayana (rejuvenation therapy), nourishing diet, adequate sleep, avoidance of the causes, and Sattvavajaya (psychological measures) to restore Ojas. Milk, ghee, meat soup and sweet, cold and unctuous foods are recommended because they share qualities with Ojas[1]. Among drugs, Jivaniya (life-promoting) herbs and Rasayana drugs are emphasised.

Several Rasayana herbs have been studied for immunomodulatory effects. Patwardhan and Gautam reviewed botanical immunomodulators from Ayurveda and described Withania somnifera, Tinospora cordifolia, Asparagus racemosus and others as candidates with experimental immunomodulatory activity[13]. Most of this evidence is preclinical.

The clinical evidence is better for stress than for immunity. In a randomised, double-blind, placebo-controlled trial in 64 adults with a history of chronic stress, a high-concentration full-spectrum Ashwagandha root extract given for 60 days significantly reduced scores on stress assessment scales and lowered serum cortisol compared with placebo[14]. This is consistent with the classical use of Ashwagandha as a Balya (strength-promoting) and Rasayana drug, and with the idea that reducing stress may protect Ojas. Whether such reductions translate into measurable improvements in immune function has not been tested adequately.

Lifestyle measures for preserving Ojas:

Sleep

Charaka counts excessive wakefulness (Ratri Jagarana) among the causes of Ojakshaya and describes proper sleep as a source of happiness, nourishment, strength and knowledge[1]. Modern evidence strongly supports a link between sleep and immunity. A detailed review of the sleep–immune relationship concluded that sleep supports the formation of immunological memory, that sleep loss impairs responses to vaccination, and that chronic sleep deficiency is associated with low-grade systemic inflammation[15]. In PNI terms, insufficient sleep is both a stressor in its own right and a pathway through which psychological stress affects immune function.

This gives a practical point of contact between classical and modern advice. Regulation of the sleep–wake cycle according to Dinacharya and Ratricharya, avoidance of late nights, and treatment of insomnia are likely to protect both psychological and immune health. Insomnia should be treated as an active target in any programme that aims to restore Ojas.

Diet and digestion

In Ayurveda, Ojas is formed from the essence of well-digested food passing through the successive tissues. Weak digestive fire (Mandagni) and the formation of undigested residue (Ama) are therefore expected to impair Ojas formation. Classical advice is to eat nourishing, easily digestible food in the right quantity and at the right time, and to avoid the dry, scanty and poor-quality foods listed among the causes of Ojakshaya[1].

Modern research on the gut microbiota and immune system offers a possible bridge here, because diet shapes the gut microbial community, and the gut is the largest immune organ in the body. However, direct studies linking Ayurvedic dietary regimens to immune or psychological markers are lacking. This is an area where well-designed dietary intervention studies could add considerable value.

Mind–body practices

Sattvavajaya, meditation and yoga are central to Ayurvedic management of mental disorders. A systematic review of randomised controlled trials of mindfulness meditation found evidence of reductions in markers of inflammation (including C-reactive protein and NF-kB activity), increases in cell-mediated immune parameters and possible slowing of cellular ageing, although results varied across studies[16]. These findings support the classical view that calming the mind protects bodily strength, and they suggest that meditation-based interventions should be included in trials aimed at restoring Ojas.

Avoidance of causes

The simplest classical instruction is to avoid the causes of Ojakshaya. In modern terms, this means reducing chronic stressors where possible, managing grief and anxiety, avoiding alcohol misuse (which Ayurveda describes as directly opposed to Ojas), maintaining adequate nutrition and sleep, and avoiding excessive exertion. Many of these overlap with standard public health advice, which strengthens the case for presenting Ayurvedic guidance in this framework to patients and policymakers.

DISCUSSION:

The parallels between Ojakshaya and stress-induced immune dysregulation are striking, particularly for causes and for clinical consequences. This suggests that classical physicians observed the same clinical reality that PNI has since explained mechanistically. It also gives Ayurveda a credible scientific language for discussing the mental component of immunity.

There are limits to the comparison. Ojas is described as a material substance located in the heart, with defined colour, taste and quantity. No single molecule, cell or organ in modern physiology matches this description. Attempts to equate Ojas with albumin, immunoglobulins or any other single marker are not supported by evidence and risk oversimplifying the concept. It is more defensible to treat Ojas as a construct that summarises overall physiological reserve and resistance, which can be approximated by a panel of measures.

A practical research approach would therefore be to define an “Ojas profile” combining: clinical signs listed in the classical texts (weakness, fear, worry, complexion, sense function), validated psychological scales (perceived stress, anxiety, depression), endocrine markers (morning and evening cortisol), and immune markers (inflammatory cytokines, lymphocyte subsets, vaccine antibody response). Such a profile could be tested for internal consistency, compared between healthy people and patients, and used as an outcome in trials of Rasayana and Sattvavajaya.

Specific hypotheses that follow from this review include: people rated by Ayurveda physicians as having Ojakshaya will show higher perceived stress, higher inflammatory markers and lower immune responses than matched controls; Rasayana drugs with anti-stress effects will improve both psychological and immune measures in chronically stressed people; and improvement in classical signs of Ojas will correlate with improvement in modern markers.

CONCLUSION:

Classical Ayurveda identified psychological distress as a cause

of Ojas depletion and linked this depletion to weakness, mental disturbance and susceptibility to disease. Psychoneuroimmunology has since shown that chronic stress suppresses immunity, increases infection risk and slows healing, and that inflammation contributes to depression. Ojakshaya can reasonably be studied as an Ayurvedic description of stress-related immune dysregulation, provided that Ojas is treated as a composite construct rather than a single molecule. Clinical studies using composite psychological, endocrine and immune measures are needed to test this link and to evaluate Rasayana therapy.

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