



## Critical Review of Shotha and Inflammation: An Ayurvedic and Contemporary Scientific Perspective

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### ABSTRACT

**Background:** Inflammation is a complex biological response to harmful stimuli, considered a hallmark of many acute and chronic diseases in modern medicine. It is characterized by vascular and cellular changes aimed at eliminating the initial cause of injury. Ayurveda, the traditional Indian system of medicine, comprehensively addresses inflammation under the term *Shotha*, which is classified as both an independent disease and a symptom in various conditions. Ancient texts such as *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya* elaborate on different types of *Shotha* based on *dosha* involvement, pathology, and prognosis. **Materials and Methods:** A critical review was conducted of Ayurvedic classical texts to explore definitions, classifications, etiologies, and pathogenesis of *Shotha*. Parallely, modern medical literature, including *Robbins and Cotran's Pathologic Basis of Disease*, was studied to understand inflammation from a biomedical viewpoint. Comparative analysis was used to identify similarities and differences, emphasizing concepts like *Aama*, *Srotodushti*, and chronicity. **Results:** Ayurvedic texts categorize *Shotha* into *Vataja*, *Pittaja*, *Kaphaja*, *Sannipataja*, *Aama Shotha*, and *Granthi Shotha*, each with distinct etiopathogenesis and management. *Shotha* is associated with deranged *doshas*, obstructed channels (*Srotas*), and *Aama*. Modern inflammation, although described with different terminology, similarly involves immune responses, cytokine activity, and tissue changes. A striking convergence was found in the understanding of chronic inflammation and the progression to degenerative diseases, which Ayurveda attributes to chronic *Shotha*. **Conclusion:** The study establishes that *Shotha* in Ayurveda and inflammation in modern medicine share overlapping pathological concepts despite differences in framework and terminology. A transdisciplinary approach integrating Ayurvedic and biomedical perspectives can enhance the understanding and management of inflammatory disorders, paving the way for evidence-based integrative therapies.

**Keywords:** *Shotha*, inflammation, *Srotodushti*, *Aama*.

### INTRODUCTION:

The Indian traditional system of medicine, Ayurveda, encompasses all aspects of life, both health and disease. Like many other pathological conditions, inflammation too has been documented in the "*Brihat Trayi*", the *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Sangraha*, dating from around 1500 BCE to 600 CE. *Madhava Nidana*, written around 700 CE and regarded as a comprehensive text on pathogenesis in Ayurveda, draws influence from all three classical texts in its depiction of inflammation.

The term *Shotha* is derived from the Sanskrit root "Shu" (meaning movement or spreading) and "Baahulyakatva," which together signify "that which spreads rapidly."<sup>i</sup> Based on various Acharyas and contextual interpretations, *Shotha* is classified in multiple ways: as one type based on general elevation (*Utsedha Samanayat*)<sup>ii</sup>; two types—*Pakwa* (matured) and *Apakwa* (immature)<sup>iii</sup>; another classification of two types—*Nija* (endogenous) and *Aganthuja* (exogenous)<sup>iv</sup>; three types- *Vataja*, *Pittaja*, and *Kaphaja*<sup>v</sup>; four types-*Vata*, *Pitta*, *Kapha*, and *Aganthuja*<sup>vi</sup>; seven types- *Vata*, *Pitta*, *Kapha*, *Vata-Pitta*, *Pitta-Kapha*, *Vata-Kapha*, and *Sannipataja*<sup>vii</sup>; and finally eight types, which include all previous seven along with *Aganthuja*. Broadly, *Shotha* encompasses a wide range of conditions from localised swelling to the inflammation of internal organs such as bronchitis and pancreatitis.

From the time of the Roman physician Celsus (30 BC–38 AD), inflammation has been described by four main signs: rubor (redness), calor (increased heat), tumor (swelling) and dolor (pain). In the 19th century, another scientist named Virchow added a fifth sign:



loss of function. Modern science has advanced a lot since then.<sup>viii</sup> Today, inflammation is seen as the body's natural healing response, especially in the early (acute) stage. When cells are injured, because of trauma or infection, the body starts a complex process involving special proteins called cytokines. These help the body return to a normal, balanced state. But if healing doesn't happen properly, inflammation can become long-lasting (chronic) and start damaging the nearby healthy tissues.

This paper aims to present the Ayurvedic viewpoint on chronic inflammation, in light of groundbreaking research from modern science. It also seeks to explore the connection between inflammation and degenerative diseases as described in classical Ayurvedic texts.

## Background and Context

Chronic inflammation is a major indicator of long-term degenerative disorders. It's also commonly seen in most age-related illnesses<sup>ix</sup>. Ageing and such disorders often go hand in hand. What's concerning today is that many young individuals are being diagnosed with conditions that were earlier considered typical of old age. Diseases like arthritis, diabetes, osteoporosis, atherosclerosis, Parkinson's, and Alzheimer's are increasingly linked to chronic inflammation. This connection is supported by elevated levels of inflammatory markers like cytokines found in patients' blood. Research also shows that with age, cytokine levels can rise by two to four times<sup>x</sup>. Chronic inflammation often comes before cancer develops. Back in the 19th century, German physician Rudolf Virchow proposed that inflammation might be connected to cancer, heart disease, diabetes, and other long-term conditions<sup>xi</sup>. Recent research has not only confirmed his theory but has also discovered a molecular basis for these diseases and their link with inflammation.

The initial inflammatory response usually begins with increased vascular activity, resulting in excessive exudate (fluid) and protein release into the extracellular matrix. This is followed by obstruction, which alters the normal diffusion of nutrients, oxygen, and waste products. Such impaired diffusion may eventually lead to the formation of tumours, either benign or malignant. According to Ayurveda, the clogging of microchannels (*srotasa*) is primarily attributed to *Aama*, a toxic by-product of improper digestion. *Aama* is considered a pro-inflammatory waste and is seen as a major factor in the disturbance of bodily channels, a condition known as *Srotodushiti*.<sup>xii</sup>

## Material and Method

This research is completely literary. Major Ayurvedic texts like the *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Samgraha* were studied to identify the various terms used for inflammation. An effort was made to draw a possible correlation between these Ayurvedic descriptions and the subject of inflammation as explained in Robbins and Cotran's Pathologic Basis of Disease. Symptoms such as *Shotha* or other signs that are frequently mentioned alongside degenerative disorders were noted and documented.

## Mechanism of Inflammation<sup>xiii,xiv</sup>

In modern medicine, inflammation is broadly classified into two types: **acute** and **chronic** (lasting more than three weeks). It is the body's natural response to injury or infection, and is a part of the healing mechanism. This process involves a complex interaction of molecules and cells that aim to restore the body's physiological balance (homeostasis) and repair damaged tissues. The inflammatory response includes both local reactions at the site of injury and a more widespread systemic response, which is regulated by chemical messengers known as cytokines and chemokines. However, if tissue healing doesn't occur properly, the inflammation can become chronic, leading to ongoing damage to the body's tissues.

## Ayurvedic View<sup>xv</sup>

In Ayurveda, inflammation is regarded as a pathological condition that requires proper management through anti-inflammatory herbs, formulations, and, more importantly, by addressing the underlying cause (*Nidana*) of the imbalance. Inflammation is not merely a symptom in Ayurvedic thought—it is also classified as an independent disease entity. The classical texts, especially *Charaka Samhita* and *Sushruta Samhita*, dedicate entire chapters to the condition known as *Shotha*, which encompasses both oedema (swelling due to fluid accumulation) and oedematous inflammation (inflammatory swelling). The concept of *Shotha* is deeply connected to disturbances in the three *Doshas*—*Vata*, *Pitta*, and *Kapha*—and its manifestation varies depending on which *Dosha* predominates. Ayurvedic treatment, therefore, involves personalised approaches that include *shodhana* (purification), *shamana* (palliative care), and diet and lifestyle corrections.

## Classification as in Charaka Samhita

*Shotha*<sup>xvi</sup>:



1. *Ekanga Shotha* (Localised swelling)
2. *Ardhanga Shotha* (Regional swelling)
3. *Sarvanga Shotha* (Generalised swelling or Dropsy)

In the *Charaka Samhita*, *Shotha* is described as an independent disease entity. It refers to a pathological condition characterised by both inflammation and oedema. Classical Ayurvedic texts like *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Sangraha* treat *Shotha* not merely as a symptom, but as a distinct disorder in itself. *Shotha* as a disease indicates an oedematous condition with general symptoms of heaviness, instability, and an elevation of heat, thinning of veins, and discolouration.<sup>xvii</sup>

Early signs of *Shotha* are marked by symptoms resembling increased vascular activity, such as a rise in local temperature and elevated venous pressure. These have been recognised as prodromal indicators suggesting the onset of the condition. The classification of *Shotha* is primarily based on its causative factors and is broadly categorised into two types. 1. *Nija Shotha*, arising from internal or endogenous causes rooted in *Dosha* imbalances, and 2. *Agantuja Shotha*, resulting from external or exogenous influences such as trauma, toxins, or infections.<sup>xviii</sup>

Types of *Nija Shotha*: *vataja*, *Pitaja*, *Kaphaja*

Causes of *Nija Shotha*: The causes of *Nija Shotha* (endogenous oedema) are diverse and deeply rooted in the internal imbalances and dysfunctions within the body. These include:

1. Complications arising from systemic disorders such as vomiting, cholera, respiratory conditions, cough, diarrhoea, anaemia, abdominal pathologies, fevers, menorrhagia, fistula, and piles.
2. Failure to undertake proper detoxification or purificatory measures, leading to the accumulation of harmful substances (*Aama*) in the system.
3. Skin disorders and microbial infections, which disturb *doshic* equilibrium and trigger inflammatory responses.
4. Suppression of natural urges, including those for vomiting, sneezing, belching, urination, defecation, flatulence, and ejaculation, resulting in vitiated *Vata* and impaired systemic function.
5. Dietary indiscretions, such as excessive intake of salt, overeating, or consumption of incompatible or unsuitable foods, all of which contribute to *dosha* vitiation and pathological fluid accumulation.<sup>xix</sup>

**Table 1. Types of *Agantuja Shotha***

Types of <i>Agantuja Shotha</i>	Causative Factor	Description
<i>Abhighata</i>	Trauma	Injury due to physical impact
<i>Bhallataka</i> <i>Pushpa</i> <i>Phala</i> <i>Rasatma</i>	Allergic substances	Reaction to irritants like <i>Bhallataka</i> (marking nut) flower or fruit extracts
<i>Krimi</i>	Infection	Caused by pathogenic organisms
<i>Visha</i>	Toxicity	Due to exposure to poisonous agents
<i>Dahana</i>	Burns	Fire, hot substances, or corrosives
<i>Sagaravata</i> / <i>Himavata</i>	Climatic changes	Extreme seasonal or weather-related influences

### ***Sushruta samhita***

In the *Sushruta Samhita*, the classification of *Shotha* shows a nuanced variation, as *Sushruta* specifically identifies *Raktaja Shotha*, inflammatory conditions arising from the vitiation of blood, as a distinct category. He also emphasises *Vranashotha*, or inflammation associated with wounds, reflecting his surgical orientation.<sup>xx</sup>

Types of *Shotha* : *Vataja*, *Pittaja*, *Kaphaja*, *Raktaja*, *Sanipataja*, *Agantuja*



### Complications Leading to *Shotha*:

*Shotha* has also been described in the Ayurvedic classics as a complication arising from pre-existing diseases. In the *Charaka Samhita*, seven types of inflammatory swellings are mentioned as complications of uncontrolled diabetes. *Sushruta* and *Vagbhata*, however, expand this list to ten types<sup>xxi</sup>. Importantly, *Charaka* also highlights that such swellings can manifest even in the absence of diabetes, particularly when obesity acts as a precipitating factor<sup>xxii</sup>.

Inflammatory swellings such as *Sharavika*, *Kacchapika*, and *Jalini* are considered difficult to manage in individuals with obesity, emphasising the link between excess body weight and poor prognosis. This reflects the ancient understanding of the interplay between inflammation and metabolic disorders.

Furthermore, *Charaka*, *Sushruta*, and *Vagbhata* all include *Vidradhi* (abscess) as one of the ten types of inflammatory swellings. *Vidradhi* may develop externally, affecting the skin, muscles, and ligaments, or internally, involving vital organs, indicating a broad and sophisticated understanding of inflammatory pathology in classical Ayurveda.

Inflammation, in Ayurvedic understanding, is often seen as a cardinal feature or symptom accompanying an abscess (*Vidradhi*). Classical texts describe both external and internal locations for such abscesses, with internal sites including the heart (potentially including the *pericardial region*), pharynx, liver, spleen, kidneys, urinary bladder, and the pelvic and inguinal regions. These locations suggest an awareness of deep-seated inflammatory processes that could correspond, in modern terms, to visceral or systemic infections.<sup>xxiii</sup>

Additionally, *Granthi*, or neoplastic growths, are considered in Ayurveda to be firm, nodular swellings that may arise when oedematous inflammation fails to resolve, indicating a possible link between unresolved inflammation and the development of abnormal tissue growths.

Aetiology also attributes the formation and persistence of inflammation to several dietary and lifestyle factors, notably excessive intake of salt, improper eating habits, and the suppression of natural bodily urges (such as urination, defecation, sneezing, and belching). These behaviours are understood to aggravate the *doshas*, particularly *Vata* and *Pitta*, thereby contributing to systemic imbalances that manifest as inflammatory conditions.

Ayurveda attributes the formation of inflammation to various dietary and lifestyle disturbances, notably the intake of an improper diet, excessive consumption of salt, and the habitual suppression of natural bodily urges. These factors are believed to disrupt the balance of *doshas*, setting the stage for inflammatory conditions. Certain systemic illnesses, such as cough, diarrhoea, anaemia, and abdominal disorders including hepatomegaly (enlarged liver), splenomegaly (enlarged spleen), and peritonitis, are also recognised as contributing to the development of oedema and inflammation.

Although *Krimi* (infection) is cited as a potential etiological factor, the classical texts place greater emphasis on *tridoshic* aggravation, in line with the humoral framework central to Ayurvedic pathophysiology. *Shotha* is further identified as a complication of *Pandu* (anaemia), indicating its close association with systemic debility. The common clinical features of inflammation, as described, include heaviness of the body, a sense of instability, localised heat, increased prominence or tenderness in the veins, and skin discolouration<sup>xxiv</sup>.

### CONCLUSION

The extensive descriptions of inflammation found in the *Samhitas* reflect a profound and detailed understanding of this pathological condition in ancient Indian medicine. Degenerative diseases such as diabetes, atherosclerosis, Parkinson's syndrome, Alzheimer's disease, osteoarthritis, and rheumatoid arthritis all share inflammation as a common underlying pathological feature. Likewise, obesity, ageing, and metabolic syndrome are now recognised for their association with low-grade chronic inflammation. Inflammation often precedes the development of cancer and is considered a hallmark of the neoplastic process. Ayurvedic literature, too, recognize inflammation not only as a cause but also as a symptom or complication of degenerative diseases, particularly highlighting obesity as a negative prognostic indicator in individuals with inflammatory conditions. This indicates a shared pathological mechanism between cancer and metabolic syndromes, namely, inflammation arising from impaired circulation and diffusion within the micro-channels (*srotasa*) of the body. Ayurveda attributes this dysfunction to the accumulation of *Aama* (toxic metabolic residue), which obstructs micro-channels, disrupts homeostasis, causes inflammation, and leads to tissue damage. *Aama* is believed to have both antigenic and pro-inflammatory properties. purification procedures, especially Panchakarma, as vital for cleansing both gross and subtle channels within the body.



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