Review Article

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Ayurveda Section

Pharmacological and Therapeutic uses of *Abhadighanvati* in *Avabahuka* (Frozen Shoulder): A Narrative Review

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ABSTRACT

Avabahuka, known as frozen shoulder, is a condition described in Ayurvedic texts under *Vatavyadhi*, which includes neurological and musculoskeletal disorders. It primarily affects the shoulder joint, leading to muscle wasting, stiffness, and restricted movement, particularly in abduction and external rotation. Standard treatments like analgesics and corticosteroid injections often provide only temporary relief and can result in side effects with prolonged use. *Abhadighanvati* is a traditional Ayurvedic formulation utilised for managing *Avabahuka*. It contains herbs such as *rasna*, *shunthi, guduchi, ashwagandha*, and *shatavari,* which possess anti-inflammatory, analgesic, and neuroprotective properties. These ingredients help relieve pain, reduce stiffness, and improve mobility by addressing the underlying pathophysiology of the condition. This review highlights the pharmacological benefits of *Abhadighanvati* and its effectiveness as an adjunct or standalone therapy for *Avabahuka*, affirming its relevance in both classical and modern medicinal practices.

Keywords: Analgesic, Anti-inflammatory, Neuroprotective, Restricted movement

INTRODUCTION

Avabahuka is a condition where aggravated *vata* localizes in the *amsa pradesha* (shoulder region), leading to contraction and subsequent wasting (*shosha*) of the muscles in the shoulder and upper arm [1]. *Avabahuka* can be correlated with frozen shoulder. It affects approximately 2 to 5% of the population [2,3], with women being four times more susceptible than men [4]. Diabetes, hyperlipidaemia and hypothyroidism are contributing risk factors for developing rotator cuff disease [5,6]. Genetic factors, including a family history of the condition and the presence of the HLA-B27 antigen, also play a significant role [7]. The main cells involved are fibroblasts and myofibroblasts, which produce a dense matrix composed of type I and type III collagen within the capsule. Over time, this matrix contracts, resulting in the characteristic symptoms of pain and stiffness. The activity and proliferation of fibroblasts in connective tissue are regulated by cytokines and growth factors, while the matrix remodeling process is controlled by matrix metalloproteinases (MMPs) and their inhibitors [8]. There is also evidence that increased levels of cytokines- particularly Interleukin (IL)-1α, IL-1β, Tumour Necrosis Factor (TNF)-α, and Cyclooxygenase (COX)-1 and COX-2- in the joint and surrounding tissues of patients with Adhesive Capsulitis (AC) contribute to an inflammatory response that promotes fibrosis [9]. The condition is primarily caused by the vitiation of *vyana vata*, which localizes *sthana samshraya* in the shoulder region *amsa pradesha*. There, it leads to the drying up *shoshana* of *shleshaka kapha*, muscles (*mamsa*), blood vessels (*sira*), and ligaments/tendons (*snayu*), resulting in symptoms such as restricted arm movement (*bahu praspandita aharatvam*), pain (*shoola*), and stiffness (*stambha*) [10,11]. All the ingredients of *Abhadighanvati* exhibit anti-inflammatory properties. Ingredients like *rasna*, *guduchi*, *shunthi*, *shatapushpa*, *hapusha*, *yavani*, and *ajamoda* demonstrate antioxidant activity. Neuroprotective benefits are seen in *shatavari*, *shunthi*, *ashwagandha*, *hapusha*, and *ajmoda* [12]. Additionally, *guduchi* and *ashwagandha* are known for their anti-arthritic properties listed in. The current review aimed to evaluate the pharmacological potential and therapeutic relevance of *Abhadighanvati* based on available preclinical and clinical studies.

Primary objective: To assess the pharmacological activities of *Abhadighanvati*, particularly its anti-inflammatory, analgesic, anti-oxidant, and neuroprotective properties.

Secondary objective: To explore the therapeutic uses, chemical constituents, and probable mode of action of *Abhadighanvati.*

Abhadighanvati- A Polyherbal Formulation

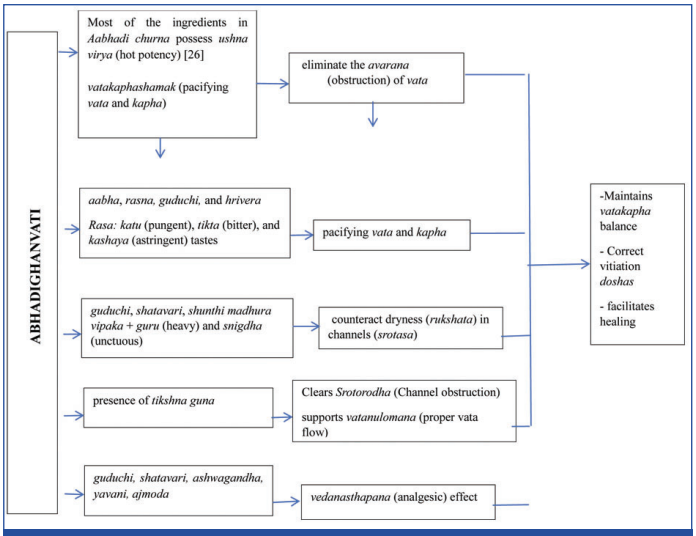
Abhadighanvati is a polyherbal formulation. *Acharya Yogratnakar* recommended *Aabhadi Churna* in the treatment of *Vatavyadhi* [12], while the text *Gadanigraha* refers to it as *Abhadya churna* in the first section (*Prathamkhand*) under *Churnadhikar* [13]. *Abhadighanvati* is a reformulated tablet version of the traditional polyherbal preparation known as *Abhadi churna*. It comprises a total of 11 ingredients [Table/Fig-1] [14-24]. It is utilised in managing conditions such as *asthisandhigata vata* (joint disorders), *snayumajjagata vata* (affecting ligaments and marrow), *katigraha* (lumbar stiffness), *gridhrasi* (sciatica), *manyastambha* (neck rigidity), *hanugraha* (jaw stiffness), and various abdominal disorders (*kosthagata rogas*) [12]. The recommended *anupana* (adjuvants) for *Abhadighanvati* include *madya* (alcoholic preparation), *mamsarasa* (meat juice), *yusha* (pulse soup), buttermilk, warm water, *ghrita* (ghee), or *mastu* (curd water) [12].

Method of Preparation of *Abhadighanvati*

Each dried sample of the raw drugs (as listed in [Table/Fig-1] [14-24]) is taken individually, powdered using a disintegrator, and passed through mesh number 08 to obtain a coarse powder (resembling the size of barley grains, known as (*yavkut churna*). The coarse powders of all drugs are then mixed thoroughly to form a homogeneous blend. This prepared *yavkut churna* is placed in a large stainless steel vessel and soaked in 16 times its volume of water overnight. The following morning, the soaked mixture is heated on *mridu agni* (mild flame) with continuous stirring, without covering the vessel. The mixture is gently boiled to facilitate evaporation, reducing the volume to one-eighth of the original quantity. Once the water-soluble phytochemicals are fully extracted and the residue (*kwatha dravya*) becomes devoid of active components (*neerasa*), the decoction (*kwatha*) is filtered using a four-layered clean cotton cloth. The filtered *kwatha* is then transferred to a stainless steel vessel and reheated with constant stirring on mild heat until the water content evaporates completely. As the mixture thickens and reaches a semisolid consistency (*ghana*), the heating process is stopped. The semisolid mass is then sun-dried until it achieves the

S. No.	Name of Ingredients	Botanical/English Name	Part used	Quantity
1.	*Babbula* [14]	*Acacia nilotica* (L.) Willd.ex Del.sp. Indica (Benth)	*Steam bark*	1 part
2.	*Rasna* [15]	*Alpinia officinarum C.B. Clarke*	*Leaf/root*	1 part
3.	*Guduchi* [16]	*Tinospora cordifolia (Willd.) Miers ex Hook.f.* and *Thoms*	*Stem*	1 part
4.	*Shatavari* [17]	*Asparagus recemosus Willd*	*Tuberous*	1 part
5.	*Shunthi* [18]	*Zingiber officinale Rosc.*	*Rhizome*	1 part
6.	*Shatapushpa* [19]	*Anethum sowa Kurz*	*Fruit*	1 part
7.	*Ashwagandha* [20]	*Withania somnifera Dunal*	*Root*	1 part
8.	*Hapusha* [21]	*Juniperus communis L.*	*Fruit*	1 part
9.	*Vruddhadaru* [22]	*Argyreia speciosa (Burm.f.) Boj.*	*Root*	1 part
10.	*Yavani* [23]	*Carum copticum*	*Fruit*	1 part
11.	*Ajamoda* [24]	*Apium graveolens*	*Fruit*	1 part

[Table/Fig-1]: Illustrating the ingredients of *Abhadighanvati* [14-24].



[Table/Fig-3]: Mode of action of *Abhadighanvati* [26].

desired elasticity suitable for pounding. Once elastic, the mass is pounded using an electric pounding machine, resulting in a smooth, dark brown material [25]. Finally, this mass is processed through a pill-making machine to form *vatis* (tablets) of 500 mg each.

Mode of action of *Abhadighanvati*

Explaining the mode of action of a drug involves establishing a connection between the *samprapti ghataka* (pathogenic factors) of a disease and the pharmacological principles of the drug namely, its *rasa* (taste), *guna* (qualities), *virya* (potency), *vipaka* (post-digestive effect), and *prabhava* (specific action). The properties of the ingredients in *Aabhadi churna* are outlined in the accompanying [Table/Fig-2] [14-24], which provides insight into its likely mechanism of action [Table/Fig-3] [26].

Literature Review on the Pharmacological Activities of Ingredients of *Abhadighanvati*

Modern experimental and clinical studies have validated the traditional claims, demonstrating activities such as anti-inflammatory, antioxidant, analgesic, and neuroprotective effects [27-44]. These findings highlight the therapeutic relevance of *Abhadighanvati* in managing inflammatory disorders, oxidative stress, and neurodegenerative conditions [Table/Fig-4] [27-44].

Clinical Evidence on the Therapeutic Efficacy of *Abhadighanvati* in Musculoskeletal Disorders

Abhadighanvati has been the subject of several Ayurvedic clinical studies exploring its role in managing musculoskeletal and degenerative conditions, such as osteoarthritis, sciatica, cervical stiffness, and lower back pain. These studies compared *Abhadi Churna* and Abhadighanavati with other classical formulations, assessing outcomes like pain reduction, joint stability, functional improvement, and neuromusculoskeletal relief [26,45-47].

Abhadi Churna consistently showed significant effectiveness in reducing stiffness, enhancing mobility, and improving overall functional outcomes. Notably, the Ghanavati form has been reported to offer greater potency and therapeutic benefits compared to the traditional powdered form [Table/Fig-5] [26,45-47].

S. No.	Name of ingredients	Rasa	Guna	Virya	Vipaka	Karma	Active Constituents
1.	*Babbula* [14]	*Kashaya*	*Guru, Ruksa*	*Shita*	*Katu*	*Kaphahara*	Arabinose, arabinose sugars, catechin, epicatechin, ß-sitosterol, and paulownin
2.	*Rasna* [15]	*Tikta*	*Guru*	*Ushna*	*Katu*	*Kaphavatahara*	Galangin, Kaempferide, diaryl-heptanoids
3.	*Guduchi* [16]	*Tikta, Kashaya*	*Guru, Snigdha*	*Ushna*	*Madhura*	*Tridosa samaka*	Tinosporin, tinosporide and cordifolide, Tinosporidine and beta-sitosterol, cordifol, hepatacosanol and octacosanol
4.	*Shatavari* [17]	*Madhur, Tikta*	*Guru, Snigdha*	*Shita*	*Madhura*	*Vata-pittahara*	Roots- Sarsapogenin; two spirostanolic &two furostanolic sponins; sitosterol, asparagamine A. Fruits- beta-sitosterol, sarsasapogenin, diosenin, asparamins A and B. Leaves- favonoids, rutin
5.	*Shunthi* [18]	*Katu*	*Guru, Ruksa, Tiksna*	*Ushna*	*Madhura*	*Vata-kaphahara*	Alpha-curcumene, beta-D-curcumene, beta-bourborene, d-borneal, citral, d-camphene, citronellol, geraniol, gingerol, zingeberol, zingerone, paradols, ginger glycolipids etc.,
6.	*Shatapushpa* [19]	*Katu, tikta*	*Laghu, tiksna*	*Ushna*	*Katu*	*Vata-kaph hara*	Fruit or seed oil- Carvone, dihydrocarvone, limonene; apilol, dill-apial, alpha-perga-motene, trans-dihydrocarvone, beta-caryophyllene, cugenol, cis-ocimene; difffuran, beta-sitosterol
7.	*Ashwagandha* [20]	*Katu, tikta, kashaya*	*Snigdha, Laghu*	*Ushna*	*Katu*	*Vata-kaphahara*	Withaferin A; withaone, withanolide WS-1, withanolide A to Y, somnirol, somnirol, somnitol, withasomniferin A, nicotine, preudotropine, tropine, solasodine, withasomnine, sitoindosides VII-X, sominone, sominolide etc.,
8.	*Hapusha* [21]	*Katu , Tikta*	*Guru*	*Ushna*	*Katu*	*Vata kapha hara*	Essential oil contain Geigerone,Junenol Junipegenin A,B,C.
9.	*Vruddhadaru* [22]	*Kashaya,katu, tikta*	*Laghu, snigdha*	*Ushna*	*Madhura*	*Vata kaphahara*	Oleic acid, Kaempferol Quercetin, etc.,
10.	*Yavani* [23]	*Katu*	*Laghu, ruksa,tiksna*	*Ushna*	*Katu*	*Kapha vatahara*	Seeds, a phenolic glycoside (l); 3-galactosyloxy-5-hydroxytoluene Essential oil- thymol, p-cymene
11.	*Ajamoda* [24]	*Katu, Tikta*	*Laghu, ruksa, tiksna*	*Ushna*	*Katu*	*Kapha-vatahara*	Seed- anthoxanthins, graveobioside A&B; myristicic acid; luteolin; apioseglycosider, myristicic acid, aprumetin umbelliferine, chrysoeriol

[Table/Fig-2]: Illustrating the properties of *Abhadighanvati* [14-24].

Plant (Ayurvedic name)	Reference	Activity	Model / method	Extract / compound	Key findings
Babbula (Acacia nilotica)	Rauf A et al., [27]	Anti-inflammatory	In-vitro (COX-2 assay)	Crude extract	Dose-dependent inhibition of COX-2; IC_{50}=83.03 µg/mL
Rasna (Pluchea lanceolata)	Srivastava V et al., [28]	Anti-inflammatory	In-vivo (carrageenan-induced oedema in mice/rats)	Ethanol extract	Significant anti-inflammatory activity comparable to indomethacin/ phenylbutazone
	Jahangir T et al., [29]	Antioxidant	In-vivo ($CdCl_2$-induced toxicity in mice)	Oral extract (100–200 mg/ kg)	Protective against oxidative stress and genotoxicity
	Srivastava P et al., [30]	Neuroprotective	In-vitro (C6 astrocytoma cells+docking)	Taraxasterol and Taraxasterol acetate	Attenuated pro-inflammatory cytokines; strong binding to TNF-α, p53, NF-κB
Guduchi (Tinospora cordifolia)	Upadhyay AK et al., [31]	Multi-activity	In-vitro and in-vivo	Extracts and phytoconstituents	Anti-inflammatory, anti-arthritic, antioxidant, hepatoprotective, immunomodulatory, antineoplastic
Shatavari (Asparagus racemosus)	Kamat JP et al., [32]	Antioxidant	In-vitro (rat liver mitochondria, gamma radiation)	Crude extract	Potent antioxidant protection against radiation-induced damage
	Ojha R et al., [33]	Neuroprotective	In-vivo (MWM, EPM, amnesia models in rats)	Methanolic extract (50-200 mg/kg)	Nootropic and anti-amnesic via acetylcholinesterase inhibition
Shunthi (Zingiber officinale, ginger)	Mozaffari-Khosravi H et al., [34]	Anti-inflammatory	Clinical trial (120 OA patients, 3 months)	Ginger powder capsules (500 mg)	Significant reduction in inflammation
	Hussein U K et al., [35]	Neuroprotective	In-vivo (MSG-induced toxicity in rats)	Ginger extract (500 mg/kg)	Neuroprotective, superior to propolis due to polyphenols
	Adel Shirin PR et al., [36]	Antioxidant	In-vitro (DPPH, reducing power assays)	Solvent extracts	Hot water extract richest in antioxidant compounds
Shatapushpa (Anethum sowa)	Saleh-e-In M [37]	Antioxidant	In-vitro (DPPH assay)	Root extracts (methanol, ethyl acetate, chloroform)	Methanol extract IC_{50}=13.08 µg/mL; comparable to ascorbic acid
Ashwagandha (Withania somnifera)	Mishra LC [38]	Anti-inflammatory	In-vivo (rat model)	Root powder (1 g/kg)	Significant reduction in inflammation
	Singh N et al., [39]	Analgesic	In-vivo (hot plate test in rats)	Extract (100 mg/kg)	Analgesic effect via prostaglandin modulation
Hapusha (Juniperus communis)	Bais S et al., [40]	Multi-activity	In-vitro, in vivo, clinical	Essential oil and extracts	Anti-inflammatory, analgesic, antioxidant, neuroprotective
Vruddhadaru (Argyreia speciosa)	Bachhav RS et al., [41]	Anti-inflammatory and Analgesic	In-vivo (mice and rats)	Methanolic root extract	Reduced writhing, increased tail-flick latency, inhibited paw oedema
Yavani (Carum copticum)	Kazemi M [42]	Anti-inflammatory and Antioxidant	In-vitro (GC/MS, NO scavenging)	Essential oil (thymol-rich)	Potent NO scavenging; inhibited iNOS expression
Ajamoda (Apium graveolens, celery seeds)	Atta AH et al., [43]	Anti-inflammatory and Antioxidant	In-vitro (COX inhibition, antioxidant assays)	Isolated compounds (sedanolide, senkyunolides, novel indole, L-tryptophan, flavonoid)	COX-I/II inhibition; compounds 6 and 7 showed strong antioxidant activity
	Momin R A et al., [44]	Analgesic	In-vivo (writhing and hot plate tests in mice)	Ethanolic extracts of medicinal plants	Apium graveolens among plants showing significant analgesic activity

[Table/Fig-4]: Illustrating the pharmacological effect of *Abhadighanvati* [27-44].

S. No.	Title	Authors Name	Sample Size	Treatment Dose	Duration	Significant outcome
1.	Comparative study of *Nagaradi churna* and *Aabhadi churna* in the Management of *Janu-Sandhigatavata* (Osteoarthritis) [45]	Wakte Swapnil D et al.,	40	2 gm BD	30 days	*Abhadi churna* demonstrated greater efficacy in relieving joint stiffness (*sandhiatopa*), enhancing joint stability, and improving functional ability compared to *Nagaradi churna*
2.	Efficacy of *Aabhadi churna* along with *pathya aahara* and *vihara* in *Gridhrasi* w.s.r. to *Sciatica*- A research article [26]	Sarla B et al.,	60	5 gm BD	90 days	*Aabhadi churna* along with *pathya aahara* and *vihara* shows more effective than *Aabhadi churna*
3.	A Clinical Effect of *Abhadi choorna* on *Katishoola* w.s.r. to *Asthimajjagat vata* - A case study [46]	Gugale Pooja S et al.,	Single case study	4 gm BD	21 days	*Aabhadi choorna* led to significant improvements in lower back pain, bilateral buttock pain, tingling sensations, and the range of anterior flexion
4.	A randomised controlled trial of *Indravarunimuladi churna* in the management of *Sandhigata vata* w.s.r. to Osteoarthritis [47].	Tanmane CS et al.,	70	5 gm BD	28 days	*Abhadi churna* showed greater effective

[Table/Fig-5]: Different Ayurvedic clinical studies on therapeutic uses of *Abhadighanvati* [26,45-47].

CONCLUSION(S)

The primary pathological factors involved in *Avabahuka* are *Vyana Vata* and *Shleshaka Kapha*, with *Vyana Vata* being the predominant *dosha*. *Abhadighanvati* possesses properties that pacify both *Vata* and *Kapha* and help in removing *Avarana* (obstruction). Additionally, it exhibits anti-inflammatory, analgesic, antioxidant, and neuroprotective effects. Considering these pharmacodynamic actions, *Abhadighanvati* can be regarded as an effective formulation in the management of *Avabahuka*. Future directions should focus on large-scale randomised controlled trials, standardisation of phytochemical profiles, and mechanistic studies to further validate its efficacy and establish its role as a complementary or standalone treatment in modern clinical practice.

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