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Review on *Yuvanpidika* Vis-A-Vis Acne Vulgaris

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ABSTRACT

Acne vulgaris is a chronic inflammatory condition of skin in youth. In *Ayurveda*, acne has been elaborated as one of the *Kshudra Rogas* (minor ailments). It is manifested in adolescence thus called as *Yuvanpidika* or *Tarunyapitika*. Symptoms of *Mukhadushika* show close resemblance with bacterial infection and inflammatory factors of acne. According to *Ayurveda*, vitiation of *Kaphadosha*, *Vata dosha* and *Rakta dhatu* lead to acne development. *Kapha* vitiation may resemble with excess sebum production, *Vata* vitiation may resemble with hyperkeratinization and *Rakta* vitiation may resemble with inflammatory mediators in blood, play an important role in pathogenesis of acne. Both modern and *Ayurvedic* sciences have considered the use of topical as well as oral medications and their combinations for the treatment of acne. Modern medications provide relief from acne vulgaris but cause noticeable side effects. In *Ayurveda*, acne has been treated mainly by *Shodhana* (purification of body) and *Shamana* (conservative treatment) *Chikitsa* or combination of both. Though, several *Ayurveda* texts such as *Sushruta Samhita*, *Ashtanga Hrudaya*, etc., have elaborated the pathophysiology and treatment of acne, the available references are scattered. Thus, there is need of in-depth review and compilation of *Ayurvedic* texts and literatures. This review may be helpful in better understanding of comparative pathophysiology and management of acne vulgaris.

INTRODUCTION

Acne is a common chronic inflammatory condition of skin with significant cutaneous and psychological disease burden[1]. Acne affects both males and females, although males tend to have more with onset of puberty. Across the globe, acne affects 80% of individuals between pubescence and 30 years of age. Many research studies have reported acne in 79-95% in the age group of 16-18 years. In India, research studies have reported acne in 50.6% of boys and 38.13% of girls in the age group of 12-17 years[2-3]. Though, acne is not a life-threatening condition, the complications of acne such as permanent scarring effects on the quality of life and emotional well-being of person[4-5].

Acne vulgaris is related to the pilosebaceous follicle. It is considered as adolescent disorder which is characterized by formation of open and closed comedones, papules, pustules, nodules and cysts. According to studies, several factors such as disturbed hormonal (androgen) production, excess sebum production, hyperkeratinization are involved in pathophysiology of acne. Accumulation of excess sebum, epithelial cells and keratin obstruct the pilosebaceous follicle. This obstruction causes formation of a keratin plug and follicle swelling below skin surface, resulting in acne lesion[6-7]. Colonized bacteria of skin such as *P. acnes* may cause severe kind of infection which leads to scarring and unpleasantness of face[7-11]. In modern medicine, several treatments are available for acne vulgaris but treatment must comply with type and severity of the lesions. Treatment mainly includes prolonged use of antibiotics, comedolytic and anti-inflammatory agents[11]. Though, these medicines are better treatment options for acne management, the side effects of these medications such as increase frequency and severity of skin dryness, scaling, erythema, burning, stinging, itching and bacterial resistance limits their use[11-13].

In *Ayurveda*, acne has been elaborated as one of the *Kshudra Rogas* (minor ailments). Acne is called as *Yuvanpidika* and *Tarunyapitika* as it manifested in *Yuva* or *Taruna* (adolescence). As the disease has local spread over the face and due to the inflammatory and scarring nature of lesions, acne is also called as *Mukhadushika*[14-15]. *Yuvanpidika* or *Tarunyapitika* or *Mukhadushika*is characterized by *Saruja* (mildly painful), *Ghan* (firm on touch), *Medogarbha* (filled with oil/sebum) and shape of *Shalmali Kantaka* (thorn of *Salmalia malabarica*)[16-17]. Many

authors elaborated that acne is caused due to vitiation of *Kapha* and *Vata doshas* and *Rakta dhatu*. Vitiated *doshas* and *dhatus* cause obstruction of *Lomakup* (pilosebaceous unit) of skin which causes acne. Further, rupture of acne causes scar formation. Also, vitiation of *Vata* and *Rakta* leads to hyperpigmentation of skin[18-19]. In *Ayurveda*, mainly two types of *Chikitsa* (treatments) have been used to treat acne i.e. *Shodhana* (purification of body) and *Shamana* (conservative treatment by oral and topical medicines). *Shodhana* includes *Vaman* and *Nasya*, whereas *Shamana* includes *Lepa*, *Upanah* and *Kshara* application[19-21]. Also, several *Ayurvedic* proprietary medicines are available in the market for the treatment of acne[14-15,20-22].

Ayurveda texts such as *Sushruta Samhita*, *Sharangadhara Samhita*, *Chakradatta* etc., have elaborated the pathophysiology and treatment of acne. There are few published articles on pathophysiology and treatment of acne vulgaris with regards to *Ayurveda* but the available references are scattered[20]. Hence, there is need of in-depth review and compilation of *Ayurvedic* texts and literatures for better understanding of *Yuvanpidika* or *Tarunyapitika* or *Mukhadushika* and its comparison with acne vulgaris described in modern science. Subsequently, it is also important to share the traditional knowledge of Indian system of medicine i.e. *Ayurveda* to offer safe and effective alternative for acne vulgaris.

***Kshudra Roga* (minor ailment)**

Kshudra Rogas (minor ailments) are described in *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hrudaya*, *Madhava Nidana*, *Yogaratnakar*, *Bhavaprakash*, *Chakradatta*, etc. The word *Kshudra* means 'minimum' i.e. with minimum *Hetu* (causative factors), *Lakshana* (signs & symptoms) and *Chikitsa* (treatment) and *Rogas* meaning diseases. Hence, *Kshudra Rogas* are diseases which have minimal causative factors, signs and symptoms and which need minimal treatment to cure[18-19,21]. In *Kshudra Roga*, mainly *Rakta dhatu* (blood) and *Mamsadhatu* (muscles) are vitiated. *Kshudra Rogas are* mainly explicated through the *Twaka* (skin). *Sushruta* has quoted 44 *Kshudra Rogas*, *Vagbhata* has mentioned 36 whereas *Madhava* has mentioned 43 *Kshudra Rogas* in their texts. *Yuvanpidika* (acne vulgaris) is one of the *Kshudra Rogas* described in various *Ayurveda* texts[21].

According to *Ayurveda*, healthy skin is a result of overall health condition of individuals. Skin is formed by the *Paka* (metabolism) of *Rakta dhatu* (blood) by its *Dhatvagni* (metabolism inducing

agent) during intrauterine life. *Sushruta* has elaborated the formation of *Twaka* by an excellent example. According to *Sushruta*, after the *Paka* of *Rakta dhatu*, it becomes dry (due to *Vata*) in the form of skin like deposition of *Santanika* (milk cream) on the surface of boiling milk. This elaboration suggests that *Rakta dhatu* (blood) is basic element in formation of skin during intrauterine life[23]. *Rakta* (blood) nourishes the skin through-out the life. Thus, impurities (inflammatory mediators) in blood explicate by skin in the form of *Kshudra Rogas* including *Yuvanpidika* (acne)[21,23]. *Twaka* (skin) is the *Mool Sthana* (primary site) for acne formation hence acne is considered as '*Twagdosha*'[14-15].

In ancient period (2nd B.C.), *Yuvanpidika* was first described in '*Tristreshniya Adhyaya*' of *Charaka Samhita*. *Charaka* has mentioned that *Pidika* (pimple) is *Bahya Roga* (external disease) and *Marga Ashrita Roga* (disease caused due to obstruction)[21]. *Sushruta* has also described *Yuvanpidika* or *Mukhadushika* in *Kshudra Roga Niadanadhyaya* (13th chapter) of *Nidana Sthana*[14]. He also described the treatment of *Yuvanpidika* in *Kshudra Roga Chikitsadhyaya* (20th Chapter) of *Chikitsasthana*[24]. Likewise, *Yuvanpidika* has been described by *Madhava*, *Vagbhata* and *Yogaratnakar* under *Kshudra Roga* chapter in their texts[21].

Causative factors of *Yuvanpidika* vis-a-vis Acne vulgaris

In *Ayurveda*, very short description is available about causative factors of acne. In *Ayurveda* texts, it has been mentioned that almost all the diseases are attributed to an abnormality of 3 *doshas* and 7 *dhatus* or *dushyas*. Components which cause *Dushti* (abnormality) in functions of these *doshas* and *dhatus* are considered as causative factors for acne[16-19]. *Kapha dosha* (oily in nature as sebum), *Vata dosha* (dry in nature) and *Rakta dhatu* (blood) are main *Samprapti Ghataka* (main pathophysiological components) in the development of acne[14-15]. According to *Sushruta*, *Rakta dhatu Dushti* (blood impurities) is one of the main pathogenic factors of acne formation. *Sushruta* described that several other important local and systemic pathogenic components related to sexual changes during adolescence are also responsible for acne formation[16]. The causative factors of acne (Table 1) are mainly divided into 4 types viz. *Kalaja* (age), *Aaharaja* (diet), *Viharaja* (physical activities) and *Manasika* (psychological).

Table 1: The causative factors of *Yuvanpidika* or *Tarunyapitika* or *Mukhadushika*[14-19,21].

Kalaja **(Time/Age factors)**	***Aaharaja*** **(Food)**	***Viharaja*** **(Activities)**	***Manasika*** **(Mind/Stress factors)**
Tarunya (young age)	*Ati Katu* & *Madhura* (excessive spicy and sweet)	*Vegavarodha* (stoppage of natural urge)	*Ati Shoka* (stress)
Madhyanha (Noon)	*Guru* (heavy to digest)	*Jagarana* (insomnia)	*Kshobha* (botheration)
Vasanta Rutu (blossom)	*Ati Snigdha* & *Dugdha Varga Aahara* (oily food, milk & milk products)	*Nidra* (excess sleep)	*Krodha* (anger)
Grishma Rutu (summer)	*Mamsa* (meat)	*Upavasa* (fasting)	*Santapa* (irritation)
Sharada Rutu	*Madya* (alcohol)	*Atapa Sevana* (excessive sun bath)	*Svabhava* (behavioral changes)

In *Ayurveda*, sexual changes depending upon the age are considered as important causative factors for acne formation. In *Kashyapa Samhita*, it has been mentioned that at the age of 16 years, the changes in secondary sexual characters (including changes in sexual organs) start and also *Shukra dhatu* (semen) development occurs. It has been also elaborated that these changes of sexual characters occur due to the combined and forceful action of *Pancha Mahabhutas* during the young age or adolescence[25]. Other authors such as *Sushruta* and *Vagbhata* have also explained that *Mukhadushika* (acne) primarily occurs during adolescence. *Bhavaprakash* mentioned that acne is caused due to *Svabhava* (behavioral changes). In *Sharangadhara Samhita*, it has been mentioned that acne is caused due to *Shukradhatumala* (byproducts during semen formation)[14-15,21].

According to modern science, several causes such as excess androgen secretion, bacteria, etc., play an important role in pathophysiological process of acne. The precise mechanism of acne is not known but there are four major factors responsible for acne formation: First, increased and altered sebum production under androgen control (or increased androgen sensitivity); second, follicular hyperkeratinization (process leading to comedones); third, proliferation and

colonization by *Propionibacterium acnes* (*P. acnes*) and *Staphylococcus epidermidis* and fourth, release of inflammatory mediators including cytokines[6].

Types of *Yuvanpidika* vis-a-vis Acne vulgaris

In *Ayurveda*, there is no specific description on types of acne. But many *Ayurvedic* physicians use anti-acne medicines as per the pathological factors i.e. vitiated *Vata*, *Kapha*, *Pitta* and *Rakta*. Thus, acne may be classified on the basis of these pathological factors. According to characters of *doshas* and *dhatus* involved, acne is categorized in four groups' viz. *Vataja*, *Pittaja*, *Kaphaja* and *Raktaja*. If there is intense itching, scaling, dryness, blackish coloration of acne lesion then it is called as *Vataja Yuvanpidika*. In case of *Pittaja* and *Raktaja Yuvanpidika* symptoms such as redness, heat and pus at acne lesion occurs. If there is increased oiliness and pus at acne lesion, that acne is called as *Kaphaja Yuvanpidika*[16].

In 1990, American Academy of Dermatology developed a classification scheme for primary acne vulgaris. This grading scale delineates three levels of acne: mild, moderate, and severe [26]. Mild acne is characterized by the presence of few to several papules and pustules, but no nodules. Patients with moderate acne have many papules and pustules, along with a few to several nodules. With severe acne, patients have numerous or extensive papules and pustules, as well as many nodules[1-7].

Pathophysiology of *Yuvanpidika* vis-a-vis Acne vulgaris

According to *Ayurveda*, *Samprapti* (pathophysiology) of acne is complex process. Initially, causative factors (Table 1) vitiate *Kapha dosha*, *Vata dosha* and *Rakta dhatu*. These vitiated elements go in the skin and obstruct the skin pores i.e. *Lomakup* (pilosebaceous unit). Obstruction of *Lomakup* (pilosebaceous unit) leads local swelling and microcomedones formation. *Paka* (metabolism) of these elements in microcomedones cause pustule, papule and cyst formation. Rupture of these microcomedones leads to *Vrana Vastu* (scar) formation[27-28]. Also, *Vata dosha* and *Rakta dhatu* cause hyperpigmentation of skin which leads to *Vyanga* (black spotting) formation[16,18]. The *Sampraptichakra* (pathophysiological process) of acne vulgaris as per *Ayurveda* science is summarized in (Figure 1).

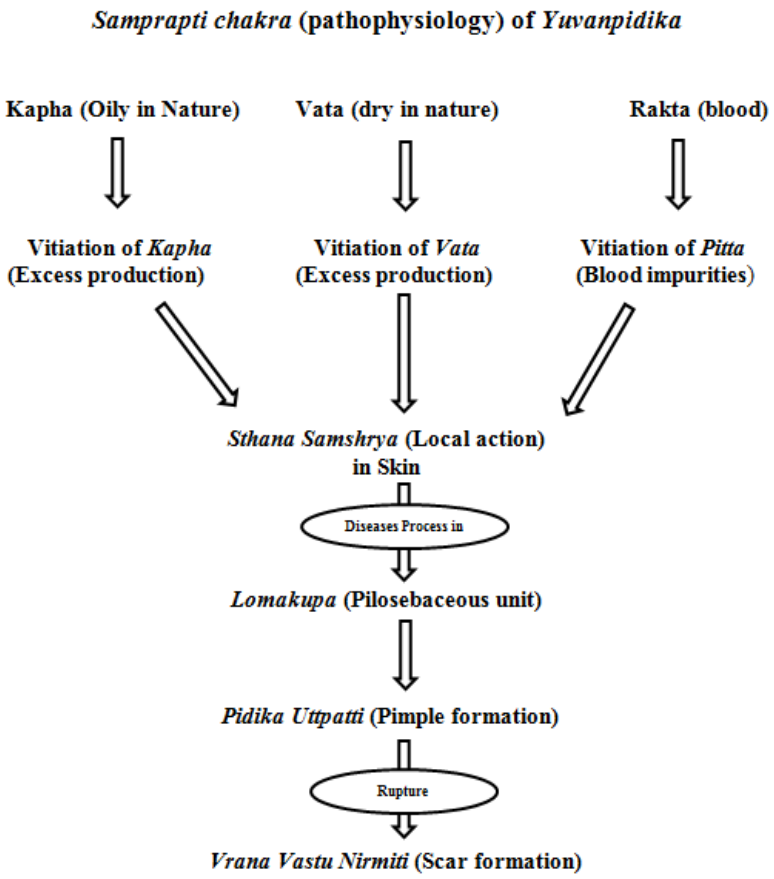

Figure 1: *Samprapti chakra* (pathophysiology) of *Yuvanpidika* as per *Ayurveda*[16,18].

As per modern medicine, though the pathophysiology of acne is multifactorial process; the initial stage of acne formation is obstruction of sebaceous gland[3]. Pathophysiology of acne vulgaris starts at adolescence when hormonal changes (androgens) are on peak in the body. Locally on the skin, androgens are involved in the regulation of cell proliferation and lipogenesis[29]. Hormones may also play a role in the follicular hyperkeratinization. The skin surface in acne prone areas is colonized with *Staphylococcus epidermidis* and *Propionibacterium acnes*[20]. It is widely accepted that acne vulgaris is induced mainly by inflammatory reaction however, it is by no means clear that either bacteria or bacterial products initiate follicular inflammation[29]. Despite this, some experimental studies have suggested that *P. acnes* are the main organism which plays an important role in pathogenesis of acne vulgaris. The overgrowth of *P. acnes* hydrolyses sebum triglycerides, producing free fatty acids and release inflammatory mediators (cytokines) which may lead to inflammatory lesions including papules, pustules, cysts and nodules[2-3]. The pathophysiology of acne vulgaris as per modern science is summarized in (Figure 2).

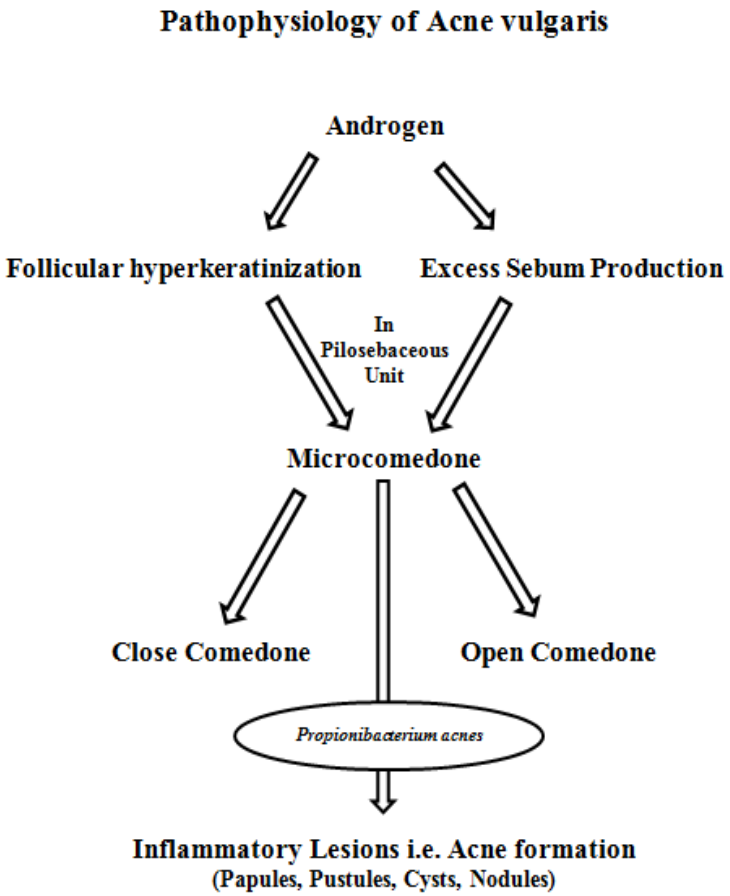

Figure 2: Pathophysiology of Acne vulgaris as per modern science[2-3].

Treatment of *Yuvanpidika* vis-a-vis Acne vulgaris

As per *Ayurveda*, treatment for acne is mainly divided into two types, i.e. medicinal treatment and surgical treatment[28].

1. Medicinal Treatment

Classical medicinal treatment for acne is of two types i.e. *Shodhana* (purification) and *Shamana* (conservative) *Chikitsa*[27]. Vitiated *doshas* are expelled out of body by *Shodhana Chikitsa*, whereas *Shamana Chikitsa* corrects vitiated *doshas* instead of expelling out from the body[24,28]. *Sushruta* has elaborated *Vaman* (emesis) as *Shodhana Chikitsa*. *Vaman* is one of best abutting therapy along with topical and oral *Ayurveda* formulations in acne vulgaris[27,30]. *Vaman* is a procedure in which *doshas* are eliminated through upper channels i.e. mouth. It helps to prevent the forthcoming diseases due to *Kapha* and *Pitta*[24,27-28]. *Nasya* i.e. introduction of medicines

through the nasal cavity is another type of as *Shodhana Chikitsa* used to treat acne. *Nasya* is a type of systemic therapy for acne elaborated by *Vagbhata* in his texts[18]. In *Nasya*, different types of oils, powder, etc., have been used to treat acne[18,21,30].

Shamana Chikitsa includes use of topical as well as oral formulations such as pills, pastes, oils, scrubs, etc[31]. These formulations normalize the vitiated *doshas*. Many classical *Ayurvedic* formulations are also available in the market in convenient dosage forms for conservative management of acne vulgaris[29,31]. These classical therapies have not only been used to cure acne but also for rejuvenation of the skin (Table 2).

Table 2: Classical therapies for acne as per *Ayurveda* texts[29,31].

Sr. No.	Therapy	*Sushruta Samhita*	*Charaka Samhita*	*Ashtanga Hrudaya*	*Yogaratnakar*	*Chakradatta*
Medicinal Treatment						
1	*Vaman*	*M	*M	*M	┼×	*M
2	*Nasya*	┼×	┼×	M	┼×	*M
3	*Lepa*	*M	*M	*M	*M	*M
Surgical Treatment						
4	*Siravyadha*	┼×	*M	*M	*M	*M

*M= Mentioned. ┼×= Not mentioned

Many authors have been emphasized in their texts on local treatment i.e. *Lepa* (paste), *Taila* (oil), *Kshara* application etc[27,29,31]. *Lepas* (pastes) act as astringent, anti-inflammatory and antibacterial agents. *Lepas* not only treat the acne but also increase the skin complexion. In *Ayurveda*, *Lepas* have been especially advised for application on oily skin whereas *Tailas* (oils) have been advised for dry type of skin. Both *Lepas* and *Tailas* have been used as anti-inflammatory for the treatment of acne.*Tailas* also possess wound healing property and it reduces scar formation[14-15,32]. Several herbs have been used to treat acne (Table 3). Few herbs help to eliminate various toxic elements present on the skin and have been used as topical antiseptic[14-15,29,31-34].

Table 3: Herbs and their action[14-15,32].

Sr. No.	Plant Name	Botanical Name	Action
1	*Lodhra*	*Symplocos racemosa*	Anti-bacterial, Anti-inflammatory, Anti-septic
2	*Vacha*	*Acorus calamus*	Anti-bacterial, Anti-inflammatory
3	*Dhanyaka*	*Coriandrum sativum*	Anti-bacterial, Anti-septic
4	*Yashtimadhuka*	*Glycyrrhiza glabra*	Skin Soothing, Regulates sebum production, Useful in hyperpigmentation, Blood purifier, Anti-bacterial
5	*Shalmali*	*Salmalia malabarica*	Anti-bacterial, Anti-inflammatory, Effective in Acne vulgaris
6	*Daruharidra*	*Berberis aristata*	Analgesic, Anti-bacterial, , Anti-dermatitis
7	*Jatiphala*	*Myristica fragrans*	Rectify uneven skin pigmentation, Inhibits melanin biosynthesis, Anti-inflammatory
8	*Manjishtha*	*Rubia cordifolia*	Useful in hyperpigmentation, Increase skin complexion & skin-glow, Anti-oxidant, Anti-inflammatory
9	*Nimba*	*Azadirachta indica*	Anti-bacterial, Useful in various skin Disorders, Anti-septic
10	*Khadira*	*Acacia catechu*	Anti-bacterial, Overall skin disorders like Anti-Eczema, Anti-scabies, Anti-dermatitis
11	*Sariva*	*Hemidesmus indicus*	Effective in Acne Vulgaris, Anti-inflammatory, Anti-bacterial, Anti-oxidant
12	*Guduchi*	*Tinospora cordifolia*	Anti-inflammatory, Anti-allergic, Anti-leprotic, Anti-stress
13	*Kakamachi*	*Solanum nigrum*	Anti-inflammatory, Anti-bacterial
14	*Methika*	*Trigonella foenum-graecum*	Emollient and healing effects, Anti-microbial, Anti-inflammatory
15	*Zendu*	*Calendula officinalis*	Anti-inflammatory, Styptic, Anti-septic, Anti-hemorrhagic

Several *Lepas* (pastes), such as *Yashtimadhvadi Lepa*, *Kaliyakadi Lepa*, *Sharapunkhadi Lepa*, *Masuradi Lepa*, etc., and *Tailas* (oils) such as *Pacnhanga Kumkumadi Taila*, *Saptatrinshada Kumkumadi Taila*, etc., are mentioned in *Ayurvedic* texts for the management of acne (Table 4).

Table 4: Ancient topical preparations of *Ayurveda* for the management of acne[14-15,27,29,31].

Sr. No.	Formulation	Contents	Action
	Pastes		
1	*Jatiphaladi Lepa*	*Jatiphala* (*Myristica fragrans*), *Chandana* (*Santalum album*), *Maricha* (*Piper nigrum)*	Reduces acne. Increases luster of face
2	*Lodhradi Lepa*	*Lodhra (Symplocos racemosa), Dhanyaka (Coriandrum sativum), Vacha (Acorus calamus), Sarshapa (Brassica campetris), Saindhava Lavan*	Reduces acne
3	*Manjishthadi Lepa*	*Manjishtha (Rubia cordifolia)* mixed with honey	Reduces acne
4	*Arjunadi Lepa*	*Arjuna* (*Terminalia arjuna*) bark mixed with honey	Reduces acne
5	*Shalmali Kalkadi Lepa*	Sharp spine of *Shalmali* (*Salmaria malabarica*) pounded with milk and mixed with oil	Makes face like lotus
6	*Vatankuradi Lepa*	*Rakta Chandana (Santalum album), Manjishtha (Rubia cordifolia), Kushtha (Saussurea lappa), Lodhra (Symplocos racemosa), Priyangu (Callicarpa macrophylla), Vata* (*Ficus bengalensis*) leaf-buds and lentils	Destroys acne and scar formation. Increases luster of face
7	*Siddharthadi Lepa*	*Siddhartha (Brassica campetris), Vacha (Acorus calamus), Lodhra* (*Symplocos racemosa*) and *Saindhava Lavana*	Reduces acne and scar formation
8	*Varunadi Lepa*	*Varuna* (*Crataeva nurvala*) and goat milk	Produces beneficial effects in acne
9	*Marichadi Lepa*	*Maricha* (*Piper nigrum*) mixed with	destroy acne

		Gorochana	
	Oils		
10	*Kumkumadi Taila*	*Kumkum (Crocus sativus), Chandan (Santalum album), Laksha (Laccifer Lacca), Manjishtha (Rubia cordifolia), Yashtimadhu (Glycyrrhiza glabra*), etc.	Promotes facial luster and alleviates acne and scars
11	*Majishthadi Taila*	*Manjishtha (Rubia cordifolia), Madhuka (Madhuca indica), Laksha (Laccifer Lacca), Matulunga (Citrus medica)* and *Yashtimadhu* (*Glycyrhiza glabra*)	Removes acne, wrinkles of face and improves facial luster
12	*Haridradi Taila*	*Haridra, Daruharidra (Berberis aristata), Madhuka, Manjishtha, Kumkuma, Tinduka*, etc.	Cures acne and scar
13	*Kanaka Taila*	*Madhuka, Priyangu (Callicarpa macrophylla), Manjishtha, Chandana*,etc.	Cures acne and scar
14	*Sarshapa Taila*	*Sarshapa* i.e. Mustard (*Brassica campestris*)	Cleans face and clears acne

Based on established knowledge of *Ayurveda*, herbal extracts and essential oils are now being effectively used in oral and topical anti-acne medicines[14-15]. Various *Ayurvedic* proprietary medicines are also available in the market for acne treatment[29]. Many clinical trials have been carried out on several oral as well as topical *Ayurvedic* proprietary medicines (Table 5) and these medicines have shown significant safety and efficacy profile in patients with acne vulgaris[29].

Table 5: *Ayurvedic* proprietary medications, their dosage and indications[39].

Sr. No.	Brand Name	Company Name	Indication (In Acne)	Dosage
Topical				
1	Skinelle Cream	Charaka	Pimples and black head (Acne vulgaris)	Twice a day or as directed by physician
2	Pimplex Cream	Unexo	Acne vulgaris	2-3 times a day
3	Pimple Touch Gel	Ratan	Pimples and Acne vulgaris	Apply on affected area leave it for an hour & Then wash
4	Parolep Powder	Ayulabs	Acne, Pimples	Powder with curd and apply 2-3 times a day on face
5	Aclear	Atrimed	Acne, white & black heads	Twice a day
6	Akpre Cream	Salveo	Acne vulgaris	Twice a day
7	Aricleanse Cream	Ari Healthcare	Acne vulgaris, hyperpigmentation and various skin disorders	2-3 times a day
Oral				
1	Purim Tablet	Himalaya	Acne vulgaris and Acne rosacea	1-2 Tablets twice daily 4-6 weeks
2	Raktashodhaka	Baidyanatha	Acne vulgaris, Skin rashes	1 tablet twice a day with water
3	Aricleanse Capsule	Ari Healthcare	Acne vulgaris, hyperpigmentation and various skin disorders	1-2 capsules twice daily orally after meals

2. Surgical Treatment

If medicinal treatment does not give better results, surgical and parasurgical procedures have been used to treat acne. *Vagbhata* has elaborated in his texts that acne can be managed by *Raktamokshana* i.e. removing infected blood. He has also indicated *Siravyadha* (venesection) to remove infected blood in severe type of acne vulgaris [18]. Several other surgical procedures such as *Chedana* (excision), *Agni Karma* (cautery), etc., have been elaborated in *Ayurveda* to treat severe types of acne[35].

In modern medicines, a variety of medications (Table 6) are available for the treatment of acne vulgaris. These medications are mainly advised to the patients according to acne grades[4,9,36].

Retinoids (tretinoin, isotretinoin, adapalene, etc.), benzoyl peroxide, topical antibiotics (erythromycin, clindamycin, etc.) are primary choice of physicians for treatment of acne vulgaris. Several other topical agents such as salicylic acid, sulphur, resorcinol, sodium sulfacetamide, aluminium chloride, zinc, azelaic acid, nicotinamide or combination triethyl citrate and ethyl linoleate have been used to treat acne vulgaris[36]. Also, combination therapies (topical and oral) have been used in case of treatment resistance and/or severe type of acne. Commonly available topical combinations are clindamycin or erythromycin combined with benzoyl peroxide, Benzoyl peroxide and topical retinoids, salicylic acid and azelaic acid and many more[4,9,36].

Table 6: Modern medicines for acne, their mechanism of action and side effects[37-38].

Sr. No.	Medicines	Mechanism of Action	Side Effects
	Topical		
1	Retinoids (Tretinoin, Isotretinoin, etc.)	Comedolytic agents. Reduce abnormal mitosis of keratinocytes and hyper-keratinization	Skin dryness, skin peeling, erythema and photosensitivity. Teratogenicity.
2	Benzoyl peroxide	Antibacterial agent. Reduces lesion counts	Risk of Allergic contact dermatitis, burning of skin, etc. It bleaches clothing and irritates the skin if used in excess.
3	Antibiotics (Erythromycin, Tetracycline, etc.)	Act on *P. acnes* and reduce inflammation	Erythema, dryness and burning sensation. Bacterial resistance.
4	Other topical agents: 1. Salicylic acid; 2. Azelaic acid; 3. Sodium Sulfacetamide; 4. Sulphur	Reduce inflammation and lesion counts	Erythema, hypopigmentation, dryness, burning sensation, etc.
5	Topical combinations (Erythromycin + Benzoyl	Act on *P. acnes* and	Erythema, dryness and burning sensation. Bacterial

	peroxide), (Adapalene + Benzoyl peroxide), etc.		reduce inflammation	resistance.
	Oral			
1	Antibiotics		Act on *P. acnes* and reduce inflammation	GI side effects, bacterial resistance.
2	OC Pills (Estrogen + Progestin)		Decrease circulating androgens	Stomach cramps or bloating, nausea, vomiting, etc.
3	Aldosterone antagonist	Spironolactone	Anti-androgen effects	Hyperkalemia, teratogenicity, gynaecomastia (in men) & menstrual dysfunction.
		Flutamide	Anti-androgen effects	Hepatotoxicity
4	Corticosteroids		Reduce testosterone levels and inflammation	Steroid acne
5	Retinoids (Isotretinoin)		Reduces sebaceous gland size and secretion, comedone formation and follicular colonization of *P. acnes*	Side effect pattern resembles hyper-vitaminosis-A syndrome
6	Oral Combinations (Trimethoprime + Sulfamethoxazole 80/400)		Act on *P. acnes* and reduce inflammation	GI side effects, bacterial resistance.

DISCUSSION

Acne is one of the most common skin problems in all over the world treated by dermatologists[5]. Adolescents are mostly susceptible to acne, but it can occur in any age group. Several *Ayurveda* texts including *Sushruta Samhita*, *Ashtanga Hrudaya*, *Bhavaprakash*, *Chakradatta Tika*, *Yogaratnakar*, *Charaka Samhita*, *Sharangadhara Samhita* and modern literatures have been reviewed concerning with acne vulgaris. After review, it has been observed that both sciences have shown great similarity in the understanding of acne vulgaris in terms of causative factors, onset of symptoms, age factors, pathophysiology and methods of treatment of acne vulgaris.

Acne has been elaborated in *Ayurveda* as a *Kshudra Roga* (minor ailment), as it is not a serious or life threatening disorder but it seriously impacts quality of life of person[4-5].

Yuvanpidika or *Tarunyapitika* or *Mukhadushika* are the terminologies used in *Ayurveda* to define the acne. *Yuvan* or *Yauvana* and *Tarunya* are related to age factors i.e. adolescence (youthfulness) and physical changes that occur during the young age[14-15]. According to Ayurveda and modern science, behavioral changes during adolescence such as anger and stress have also been considered as contributory factors for acne development[23-25]. In the definition of *Mukhadushika*, the word *Dushika* can resemble with inflammatory mediators and bacteria that cause acne vulgaris[23]. The word, *Paka* (metabolism) also may resemble with inflammatory pathophysiological factors of acne[23]. In the *Samprapti* (pathophysiological) process of acne, factors stated by *Ayurveda* such as vitiated *Kapha*, *Vata* and *Rakta* can resemble with modern pathophysiological factors such as excess sebum production, hyperkeratinization and blood impurities, respectively. *Vata* is known to have *Pravartaka* i.e. stimulant action (for hyperkeratinization), whereas *Kapha* is oily in nature[14-15,29,34].

As far as the treatment of acne is concerned, both the sciences advise the use of topical as well as oral medications[2-3,15,18,20]. Modern science describes the treatment as per the severity of the acne, similarly *Ayurveda* has also advised *Raktamokshan* (bloodletting) for severe cases of acne[18,35]. *Ayurveda* believes in expelling the root causes of acne by advising *Shodhana Chikitsa*[19-21]. Modern science also aims at eliminating one of the main factors of acne i.e. *P. acnes* bacteria by advising oral as well as local antibiotics. Effective treatment modalities are available in both the sciences, but sometimes adverse effects of modern medicines limit their use[1-4,14-15,36].

In the present review, an effort is made to compile scattered references of acne under one roof and also a comparison is made between *Ayurveda* and modern medicines with regards to understanding of acne. Looking at the incidence of acne in the society, continuous efforts have to be made towards development of newer effective and safe remedies for the treatment of acne. Looking at in-depth knowledge, *Ayurveda* can certainly contribute in the development of newer effective and safe remedies for the treatment of acne.

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REFERENCES

1. Knutsen-Larson S, Dawson AL, Dunnick CA, Dellavalle RP. acnesvulgaris: Pathogenesis treatment and needs assessment. Dermatol Clin 2012;30:99-106.
2. Kubba R, Bajaj AK, Thappa DM, Sharma R, Vedamurthy M, Dhar S, et al. Acne and quality of life. Indian J Dermatol Venereol Leprol 2009;75(S1):4-5.
3. Makrantonaki E, Ganceviciene R, Zouboulis C.An update on the role of the sebaceous gland in the pathogenesis of acne. Dermatoendocrinol 2011;3(1):41-9.
4. Ray C, Trivedi P, Sharma V. Acne and its treatment lines.International Journal of Research in Pharmaceutical and Biosciences 2013;3(1):1-16.
5. Mancini AJ. Incidence Prevalence and pathophysiology of acne. Advanced Studies in Medicine 2008;8(4):100-5.
6. Tahir CM. Pathogenesis of acne vulgaris: Simplified.J Pak Assoc Dermatol2010;(20):93-7.
7. Collier CN, Harper JC, Cantrell WC, Wang W, Foster KW, Elewski BE. The prevalence of acne in adults 20 years and older.J Am Acad Dermatol2009;58(1):56-9.
8. Hedden SL, Davidson S, Smith CB. Cause and effect: The relationship between acne and self-esteem in adolescent years.J Nurse Pract 2008;4(8):595-600.
9. Munavalli GS, Weiss RA. Evidence for laser- and light-based treatment of acne vulgaris. Semin Cutan Med Surg 2008;27(3):207-11.
10. Liao DC.Management of acne.J Fam Practice 2003;52(1):43-51.
11. Jain A, Basal E.Inhibition of Propionibacterium acnes-induced mediators of inflammation by Indian herbs. Phytomedicine 2003;10(1):34-8.
12. Amrita G, Greeshma N, Deepa M, Poornima EH. A review on anti-acne potential of medicinal plant extracts against Propionibacterium acnes.Int J Pharma Bio Sci 2012;3(3):987-97.
13. Longshore SJ, Hollandsworth K. Acne vulgaris: One treatment does not fit all.Cleve Clin J Med 2003;70(8):670-80.
14. Kumar S, Palbag S, Maurya SK, Kumar D. Skin care in Ayurveda: A literature review. International Research Journal of Pharmacy 2103;4(3):1-3.
15. Bedi MK, Shenefelt PD. Herbal therapy in dermatology. Arch Dermatol 2002;138(2):232-42.
16. Sharma A, Sharma PV. Sushruta Samhita. Volume-I. Varanasi: Chaukhambha Surbharati Prakashan; 2012.pp. 559.
17. Gupta A, Upadhyaya Y.Ashtanga Hrudaya of Vagbhata.Varanasi: ChaukhambhaPrakashan;2012.pp. 765.
18. Gupta A,Upadhyaya Y. Ashtanga Hrudaya of Vagbhata. Varanasi: Chaukhambha Prakashan; 2012. pp. 769.
19. Shastri B.Yogaratnakara of Lakshmipati Shastri. Uttarardha. Varanasi: Chaukhambha Prakashan; 2012. pp. 272-273.
20. Rathod M, Kamath S. A clinical study to evaluate the efficacy of Jalaukavacharana and Sarivadyasava in Yuvanpidaka (acne vulgaris). Int Res J Pharm2012;3(7):215-7.
21. Kartikey, Niranjan R, Shreekanth U. A clinical study showing the effect of an Ayurvedic regimen on acne vulgaris. Anaplastology 2012;1(3):1.

22. Murthy HC. Sharangadhara Samhita of Sharangadharacharya (English Translation).Varanasi: Chaukhambha Sanskrit Series Office; 2010. pp. 371-372.
23. Sharma A, Sharma PV. Sushruta Samhita. Volume-II. Varanasi: Chaukhambha Surbharati Prakashan; 2012. pp. 47-48.
24. Sharma A, Sharma PV. Sushruta Samhita. Volume-II. Varanasi: Chaukhambha Surbharati Prakashan; 2012. pp. 332-333.
25. Sharma H, Bhishgacharya S. Kashyapa Samhita of Vruddhajivaka.Varanasi: Chaukhambha Sanskrit Sansthan; 2012. pp. 79.
26. Strauss JS, Krowchuk DP, Leyden JJ, Lucky AW, Shalita AR, Siegfried EC, et al. Guidelines of care for acne vulgaris management. J Am Acad Dermatol 2007;56(4):651-63.
27. Gupta A, Upadhyaya Y. Ashtanga Hrudaya of Vagbhata. Varanasi: Chaukhambha Prakashan; 2012. pp. 14-15.
28. Bhatted S, Shukla VD, Thakar A, Bhatt NN. A study on Vasantika Vamana (therapeutic emesis in spring season) - A preventive measure for diseases of Kapha origin. Ayu 2011;32(2):181-6.
29. Solanki R, Kolhapure SA. Evaluation of efficacy and safety of Clarina cream in newly diagnosed and previously treated cases of acne vulgaris. Antiseptic 2004;101(7):285-90.
30. Gupta A, Upadhyaya Y. Ashtanga Hrudaya of Vagbhata. Varanasi: Chaukhambha Prakashan; 2012. pp. 561.
31. Chowdhury K, Dhakar R, Patil SB, Jain R, Datta N. Role of Rohitaka and Sharapunkha on Mukhadushika. Int J AyuHerb Med2013;3(3):1159-73.
32. Sharma PV. Chakradatta Tika (English Translation).Varanasi: Chaukhambha Publishers; 2007. pp. 439, 441-442.
33. Gupta A, Upadhyaya Y. Ashtanga Hrudaya of Vagbhata. Varanasi: Chaukhambha Prakashan; 2012. pp.557.
34. Gupta A, Upadhyaya Y. Ashtanga Hrudaya of Vagbhata. Varanasi: Chaukhambha Prakashan; 2012. pp.558.
35. Pampaniya PV, Pandyal DH. Effect of Shalmalyadilepa and Guduchyadivati in the management of Yauvanapidika (Acne).Ayu 2013;34(2):174-9.
36. Zaidi Z. Acne vulgaris - an update on pathophysiology and treatment.J Pak Med Assoc 2009;59(9):635-7.
37. Williams HC, Dellavalle RP, Garner S.Acne vulgaris. Lancet 2012;379:361-72.
38. Nguyen R, Su J. Treatment of acne vulgaris.Paediatr Child Health 2010;21(3):119-25.
39. Nayaka B. Ayurvedaline. 11th ed. Bangalore: Publication byS Prasad; 2013. pp. 571-573.