A Review on Samprapthi and Lakshana of Mukhadushika with special reference to Acne Vulgaris

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ABSTRACT
Mukhadushika is one among skin diseases that affects the face and disturbs physical, social and psychological state of individuals. According to Acharya Sushruta, it is a Kapha Vata pradhana disease with Rakta as dushya, wherein Acharaya Vagbhata consider Meda as a dushya . Acne vulgaris can be a probable co-relation of Mukhadushika in contemporary science. It is one of the most common dermatological problem that affects virtually all individuals at least once during life. The key components of its aetiology includes increased sebum production, colonisation of pilosebaceous ducts by Propionibacterium acnes, which in turn causes inflammation, hypercornification and occlusion of pilosebaceous ducts. In this article, an attempt is made to review the samprapthi and lakshana of Mukhadushika with special reference to Acne vulgaris.

KEYWORDS
Mukhadushika, Acne Vulgaris
INTRODUCTION
The word ‘mukha’ means ‘face’ or ‘countenance’ and ‘dushika’ means ‘face spoiler’ or ‘eruption that configures the mukha (face)’. The word ‘Mukhadushika’ is derived from ‘Mukham dushayathi vivarnam karothi iti Mukhadushika’ means that which disfigures the mukha along with causing discolouration. It is one among the Kshudrarogas. It is primarily seen on the face of youth (yuva). Mukhadushika can be probably correlated to Acne Vulgaris in contemporary science. According to the Global Burden of Disease (GBD) study, acne vulgaris affects approximately 85% of young adults with age group ranging from 12–25 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. Acne is the chronic inflammation of the pilo-sebaceous units (hair follicle, hair shaft and sebaceous gland.). This condition generally starts after puberty and affects more than 90% of adolescents. Acne vulgaris is a self-limited disease and pleomorphic in presentation with a variety of lesions consisting of comedones, papules, pustules, nodules and as sequelae to active lesions, pitted or hypertrophic scar formation.

OBJECTIVES
1) To review the Samprapthi of Mukhadushika with special reference to Acne vulgaris.
2) To review the Lakshanas of Mukhadushika with special reference to Acne vulgaris

MATERIALS
Material are collected from Ayurvedic classical literature, Modern text books, Available research up-dates and scientific information available on internet.

REVIEW ON MUKHADUSHIKA
Mukhadushika is one among the kshudrarogas which has alpa hetu, alpa lakshana and needs alpa chikitsa. It is caused by Kapha and Vata dosha with Rakta as dushya according to Sushrutha and Medas as dushya according to Vagbhata. This roga appears like Shalmali kandaka aakara, medogarbha, has saruja pidaka which is Ghana. It is primarily seen on the face of youth (‘mukhe yunam’).

NIDANA
As Mukhadushika is a kshudraroga,which has alpa hetu, alpa lakshana and needs alpa chikitsa, Nidana of Mukhadushika has not been mentioned in Ayurvedic literature. Assessment of samanya dosha prakopaka nidana could clarify this factor.
SAMPRAPTI
Due to nidana there will be vitiation of Vata-Kapha dosha. Also there will be vitiation of Rakta-dhatu. Inturn, due to ashrayayashrayai bhava, it affects Pitta dosha. Medodhatu is also a contributing factor in Mukhadushika. Twaksnigdhata in youvana(taruna/yuva) which occur as swabhava(naturally) also contributes to the samprapthi.
All these factors produce following lakshanas.

LAKSHANA
The lakshanas are mentioned below (Table 1).

Table 1 Lakshanas of Mukhadushika

<table>
<thead>
<tr>
<th>Sl. no.</th>
<th>Parameter</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Shape of lesion</td>
<td>Shalmali kantaka aakara pidaka (the sprout on the bark of shalmali tree, bombax malabaricum.)</td>
</tr>
<tr>
<td>2.</td>
<td>Induration</td>
<td>Ghana (hard)</td>
</tr>
<tr>
<td>3.</td>
<td>Fluid in lesion</td>
<td>Medogarbha (containing fat in eruption)</td>
</tr>
<tr>
<td>4.</td>
<td>Pain</td>
<td>Sa raja (painful)</td>
</tr>
</tbody>
</table>

REVIEW ON ACNE VULGARIS
Acne vulgaris is a self-limited disorder primarily of teenagers and young adults, although perhaps 10–20% of adults may continue to experience some form of the disorder. The permissive factor for the expression of the disease in adolescence is the increase in sebum production by sebaceous glands after puberty.

ETIOPATHOGENISIS
The key components of aetiology are increased sebum production, colonisation of pilosebaceous ducts by Propionibacterium acnes, which in turn causes inflammation, hypercornification and occlusion of pilosebaceous ducts.11

Causes of Acne includes:
- Use of medications like lithium, steroid and anticonvulsants
- Sunlight exposure
- PCOD
- Pregnancy
- Use of occlusive wear like shoulder pads, backpacks and underwire brassiers12

During puberty, androgens stimulate an increase in the size of the sebaceous glands and sebum production is increased. Sebaceous glands require androgenic stimulation to produce significant quantities of Sebum. These large glands themselves generate more active androgen metabolites through the activity of type 1, 5a-reductase; one effect of these metabolites is to further increase the size of the sebaceous glands. Sebum acts in association with bacteria to produce keratinization and as a consequence of this blockage of the pilosebaceous duct and comedo formation take place.
The primary organism responsible for this is Propionibacterium acnes. This organism increases in number during sudden outbursts and is key factor in the change from non-inflammatory to inflammatory acne. This bacterium produces many inflammatory substances, such as lipases, proteases, hyaluronidases, and chemotactic factors that play key roles in producing lesions.

Sebaceous gland activity is regulated by androgens from the testes and adrenals, which stimulate, and oestrogens, which seem to suppress activity. In the adult male the glands are normally maximally stimulated, leading to more severe in boys than in girls. The skin itself is a major site for androgenic conversion similar to that seen in the prostate gland and in the male genitalia. Dihydrotestosterone (DHEA), rather than testosterone, may be the end-organ effector and is formed within the target cells where it stimulates lipogenesis as well as mitosis. Oestrogens reduce the size of sebaceous glands and sebum production is diminished. Both androgens and progestogens increase sebum excretion and oestrogens reduce it, although the hormonal effects may also reflect end-organ sensitivity, as most patients have normal hormone profiles.

**CLINICAL FEATURES OF ACNE VULGARIS**

The primary site of acne is the face and to a lesser degree the back, chest, and shoulders. On the trunk, lesions tend to be numerous near the midline. The disease is characterized by a great variety of clinical lesions. The lesions may be either non-inflammatory or inflammatory. The non-inflammatory lesions are comedones, which may be either open (blackheads) or closed (whiteheads). The open comedo appears as a flat or slightly raised lesion with a central dark-coloured follicular impaction of keratin and lipid. The closed comedones, in contrast to the open comedones, is difficult to visualize. They appear as pale, slightly elevated, small papules and do not have a clinically visible orifice. Stretching of the skin is an aid in detecting the lesions. Because the closed comedones are potential precursors for the large inflammatory lesions, they are of considerable clinical importance. The inflammatory lesions vary from small papules with an inflammatory areola to pustules to large, tender, fluctuant nodules. Whether the lesion appears as a papule, pustule, or nodule depends on the extent and location of the inflammatory infiltrate in the dermis.

The characteristic scar of acne is a sharply punched-out pit. Where inflammation has been marked, the pits may have multiple openings. Less commonly, broader pits...
may occur, and in rare instances, especially on the trunk, the scars may be hypertrophic. (Table 2).

**Table 2 Clinical Features of Acne Vulgaris**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Distribution</td>
<td>Face, upper back and chest</td>
</tr>
<tr>
<td>Morphology</td>
<td>Open and closed comedones, erythematous papules, Pustules and cysts</td>
</tr>
<tr>
<td>Stages</td>
<td>Inflammatory and Non inflammatory</td>
</tr>
</tbody>
</table>

**DISCUSSION ON SAMPRAPTHI OF MUKHADUSHIKA WITH SPECIAL REFERENCE TO ACNE VULGARIS:**

Samprapthi is not mentioned for Mukhadushika in any of the classics. The description of Mukhadushika in different classics shows different stages of same Samprapthi. Initially the non inflammatory stage of acne vulgaris can be attributed to medogarbha, saruja and Ghanapidaka stage. In this stage, there is only dosha involvement along with other factors like Vaktra snigdhata. The involvement of Rakta dhatu along with Vata and Kapha may lead to inflammatory lesion.

The closed comedon may be the precursor of an inflammatory stage where there will be vitiation of Kapha, Vata and Rakta. The vitiation of Rakta and Sweda in turn leads to vitiation of Pitta. According to Acharya Charaka, when the aggravated Pitta gets localized in Rakta and twak there will be formation of Pidaka. Along with the presence of vata-kapha and rakta (in turn pitta) dushti, which favours the growth of Propionibacterium acne leading to acne vulgaris.

Acharya Bhavprakasha has mentioned Swabhava as the cause of mukhadushika, besides the aharaja and Viharaja nidanas. In this context Swabhava can be understood as youvana, where shukra dhatu is produced in more quantity which is a natural process. This can be understood as excess production of androgen during adulthood. Acharya Sarangadhara has also mentioned the same context as vaktra snigdhata is shukradhatu mala. The activity of androgens that speed up the shukradhatu function, leading to more mala formation, that is Twaksnigdhata.

Similar understanding can be seen in contemporary science as sebaceous gland activity is regulated by androgens from the testes and adrenals, which stimulate, and oestrogens, which seem to suppress activity. When pathophysiology of Acne vulgaris is analysed, Sebum acts in association with bacteria to produce keratinization and as a consequence of this blockage of the pilosebaceous duct and comedo formation take place. In the adult male the androgens from the testes and adrenals stimulate sebaceous glands
maximally stimulated, leading to more severe form in boys than in girls.
Possibly, along with the vitiation of vatakapha dosha and rakta, there can be malfunctioning of medo dhatwagni resulting in excess of sweda which obstruct the lomakoopa causing medogarbha pidakas. Twakdhatu rasadhatu can also be attributed in the samprapthi since the mala of Mamsadhatu, the romakupa mala is having a role in pathogenesis. Also charmasneha is the mala of Majjadhatu which can be attributed to sebaceous secretions in Mukhadushika. 

In total, Kaphadosha, Vatadosha and Raktadhatu vitiate and obstruct the skin pores i.e. Lomakupa(pilosebaceous unit). Chronic inflammation of the pilosebaceous units leads local swelling and micro comedones formation. Paaka of comedones due to the inflammation by the supportive elements in micro comedones cause pustule, papule and cyst formation. Rupture of these microcomedones leads to Vrana Vastu (scar) formation.

SROTAS
Particularly Swedavaha srotas is obstructed by Kapha and Vatadosha. Sweda (medo mala), which obstruct the lomakoopa(swedavaha srotomoola) causes medogarbha pidakas. Twakdhatu/ rasa dhatu vitiation is evident in samprapthi when the mala of Mamsadhatu, the romakupa mala, is involved in pathogenesis. Also Majja mala is charmasneha which can be attributed to sebaceous secretions in Mukhadushika.

SROTODUSHTI:
Here we can see two types of Srotodushti. Sanga: The path of Sweda is obstructed by Kapha and Meda. Atipravritti: According to Acharya Sharngadhar a there is excess secretion of Shukradhatu mala i.e. Twaksneha.

AGNI
Among all the Agnis, Jatharagni mandhya is seen in this disease. Because of Jatharagni mandhya, Ama is formed, which again vitiates the rasa and Rakta. Ama producing srotorodha in the form of sanga leads to the pathology of Mukhadushika. Also medo dhatwagni manda is seen on its analysis.

ROGAMARGA
Mukhadushika is mostly expressed on the skin of the face. So it can be considered as Bahya rogamargagata Vyadhi.

VYAKTI
The lesions of the disease are mostly seen on the face, so the Vyaktisthṇa of the disease is Mukha.

UDBHAVA STHANA

Mukhadushika is considered as an Amashayotha Vyadhi because the main Dosha of the disease is Kaphadosha.

Thus, the Samprapti Ghatakas can be concised as given in table 3

| Table 3 Samprapti Ghatakas of Mukhadushika |
|---|---|
| 1 | Dosa | Kaphavata |
| 2 | Dushya | Rasa, Rakta, Mamsa, Medas, Shukra |
| 3 | Srotas | Swedavaha, Raktavaha, Ras avaha |
| 4 | Mala | Pitta, Sweda, Twak Sneha, |
| 5 | Srotodushti | Sanga, Atipraavruthi |
| 6 | Agni | Dhatwagni Mandyya |
| 7 | Rogamarga | Bahya Marga |
| 8 | Udbhavashana | Amashayotha |
| 9 | Vyakbasthana | Mukha |

DISCUSSION ON LAKSHANAS OF MUKHADUSHIKA WITH SPECIAL REFERENCE TO ACNE VULGARIS

Primary site of acne is the face and to a lesser degree the back, chest, and shoulders. Mukhadushika appears on face only. But due to the intensity of manifestation, it can manifest in the other sites and can be coined to the term youvanapidaka.

The lesions of acne may be either non inflammatory or inflammatory. The non inflammatory lesions are comedones, either open (blackheads) or closed (whiteheads).

The open comedo appears as a flat or slightly raised lesion with a central dark-colour follicular impaction of keratin and lipid. This non inflammatory comedo can be attributed to Kapha Vata dushti causing Medogarbha and Ghana pidaka development. Closed comedones are precursors for the large inflammatory lesions. The inflammatory lesions vary from small papules with an inflammatory areola to pustules to large, tender, fluctuant nodules. This can be attributed to the stage where Rakhadhatu is vitiated and is associated with Pitta dosha also. Whether the lesion appears as a papule, pustule, or nodule depends on the extent and location of the inflammatory infiltrate in the dermis. Therefore, the overall symptoms that develop in Mukhadushika are Pidaka (eruption similar to shalmalikantaka) which is Saruja (pain), Ghana (thick), Medogarbha (containing fat in eruption), Kandu (itching associated with kapha), Sarakthata (bleeding associated with pitta and rakta), Daha (burning sensation due to pitta and rakta), Twak Snigdhata (greasy skin) and Nimnata (erosions or partial epidermal loss).

CONCLUSION

The non inflammatory stage of acne vulgaris can be attributed to medogarbha,
saruja and Ghana pidaka stage. In this stage, there is only vata kapha dosha involvement along with other factors like Vaktra snigdhta.

The involvement of Rakta dhatu along with vata and kapha may lead to inflammatory lesion. On analysis of samprapthi , as there is rakta as dushya, which is intern the ashraya of pitta. So if the Rakta is vitiated, there is vitiation of Pitta. Also another site of pitta is sweda. If rakta and sweda get vitiated , the vitiation of pitta is obvious.

Therefore, along with the presence of vatakapha and rakta(inturn pitta) dushti , there is a chance of growth of propionibacterium acne, which is the primary organism in manifestation of acne vulgaris.

The adolescence age and oily skin is a cause to the formation of Mukhadushika. When shukradhatu is in a predominant state in adolescence, and vaktra snigdhta occurs as a shukradhatu mala . Androgens stimulate an increase in the size of the sebaceous glands and, hence, sebum is produced in a greater degree. Sebum acts in association with bacteria to produce keratinization and as a consequence of this blockage of the pilosebaceous duct and comedo formation take place. Rupture of these comedo will lead to scar formation.

Vitiation of vata kapha dosha and rakta, there can be malfunctioning of medodhatwagni. This result in excess production of sweda (sweda is medo mala), which obstruct the lomakoopa (swedavaha sroto moola) causing medogarbh pidakas . The mala of Mamsadhatu , the romakupa mala , will also play role in the pathogenesis. Also Majjadhatu mala (the charmasneha) play a role on samprapthi which can be attributed to sebaceous secretions in Mukhadushika.

The description of Mukhadushika in different classics shows different stages of same Samprapthi. Initially the non inflammatory stage of acne vulgaris can be attributed to medogarbh, Saruja and Ghana pidaka stage. If the closed comedon may be the precursor of an inflammatory stage where there is vitiation of Kapha, Vata and Rakta. Inflammatory acne vulgaris can be attributed to the samprapthi told by Susrutha.

The review study reveals the probable correlation of samprapthi and lakshana of Mukhadushika with special reference to Acne vulgaris.

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