CLASSIFICATION OF ENLISTED AYURVEDIC LIPID LOWERING HERBS ACCORDING TO PRINCIPLE OF AYURVEDA

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ABSTRACT
Dyslipidemia is a condition marked by unhealthy abnormal concentrations of lipids in blood. There is no direct description of dyslipidemia in Ayurvedic texts. However Medo Rogas (fat disorders) are described in Ayurvedic texts since ancient times. Dyslipidemia (Medo roga) is a disease of diminished Jatharagni, Bhutagni and Dhatwagni induced Apachita or Saam Asthayi Meda Dhatu Vridddhi. So for the management of Dyslipidemia (Medo roga) such drugs are needed which having Deepan, Pachan, Kaphaghna and Medoghna properties. In this regards it is time essential to classify them by considering its specific therapeutic effect and not only by using as an indistinct lipid lowering agent. **Aim:** To review the properties and action of Ayurvedic lipid lowering herbs against specific involved Samprapti Ghatak (pathological factor) in the management of Dyslipidemia (Medo roga). **Result:** Study provides good evidence of classification of Ayurvedic lipid lowering herbs in the management of Dyslipidemia (Medo roga).

KEYWORDS: Dyslipidemia, Medoroga, Medo Dhatu, Ayurvedic lipid lowering herbs.

INTRODUCTION
Dyslipidemia is a condition marked by unhealthy abnormal concentrations of lipids in blood. Latest studies have reported that increased cholesterol level is present in 25-30% of urban and 15-20% rural population. It is a major risk factor for many life threatening disorders like atherosclerotic cardio and cerebro vascular disorders (ASCVD). It has been closely linked to the pathophysiology of ASCVD and Dyslipidemia is a key independent modifiable risk factor.[1,2] In India the burden of ASCVD is alarmingly high and usually gets the disease at early age with more severe form with poor outcome.[3] By virtue of this importance it is rationale to provide safe and effective management for Dyslipidemia.

Now research interest has focused on various Ayurvedic herbs for their potential role in lipid lowering properties. Herbal medicines are used as single and compound formulations or along with minerals. Many Ayurvedic herbo-mineral formulations are processed in herbal juices to increase the potency of formulation. Phytochemical and pharmacological studies are in course to ascertaining the lipid lowering properties of many herbal plants described in Ayurveda text from last few decades. Clinical studies also have reported that Ayurvedic herbal medicines are effective in lowering LDL-C.[4] Hence reexploring the rich heritage of herbal medicines of Ayurveda is essential by extensively conducting the preclinical studies and randomized controlled trials. But while using rich heritage of Ayurveda for clinical purpose one should not neglect the concept of Agni, Dosha Dhatu and Strotagamitva of herbs.

**AIM:** To review the properties and action of Ayurvedic lipid lowering herbs against specific involved Samprapti Ghatak (pathological factor) in the management of Dyslipidemia (Medo roga).

MATERIALS AND METHODS
Literature of Ayurveda and research evidences was reviewed, along with taking into consideration of their active principles and pharmacological properties. Understandings of Dyslipidemia were discussed as per Ayurveda system of medicine and Ayurvedic lipid lowering herbs were classified on the basis of principle of Ayurveda and pharmacological research studies.

**Dyslipidemia (Medoroga)**

There is no direct description of dyslipidemia or hyperlipidemia in Ayurvedic texts. However Medo Dhatu Rogas (disorders) are described in Ayurvedic texts since ancient times. Excessive accumulation of Meda in body causes various diseases like Medoroga or Sthaulya or Atisthaulya, Granthi, Galaganda and Madhumeha.[5]
Correlation of Etiological factors of Dyslipidemia (Medo roga)

Dyslipidemia have varied type of etiological factors. Apart from congenital types (i.e. type I, IIa, III and IV) various acquired types are also found in the development of lipid disorders. Acquired etiological factors are most commonly found in the development of lipid disorders than congenital. Acquired factors are obesity, diabetes mellitus, physical inactivity, alcoholism, hypothyroidism, nephrotic syndrome, cholestatic liver disease etc.[6]

As per Ayurveda, Medodhatu has immediate relationship with Rakta Dhatu in terms that Prasad Bhaag produced during metabolism of Rakta Dhatu nourishes Meda Dhatu. Rakta Dhatu is responsible for transportation of Asthaya Meda Dhatu (circulating lipids) to all over body tissue. Pathogenesis of Madhumeha (Diabetes mellitus) states that the prime involvement of Meda Dhatu in disease formation[7] Vrikk and Vapavahan are the Moola shthana of Medovaha strotas.[8] Hence there is involvement of Vrika in Meda dhatu vikaras (lipid disorders). Liver is the main site for formation and processing of lipids. Dyslipidemia (Medo Roga) is the common feature in various liver disorders. Alcohol consumption is viitiating factor for Medo Dhatu Vikara.[9] After critical study of both modern and Ayurvedic literature it may be stated that Medo roga may have involvement of Tridosha, Rakta Dhatu (blood tissue), Yakrit (liver), Vrika (kidney) and Vapavahan (omentum).

Concept of Dyslipidemia in Ayurveda

The term Medo Dhatu described in Ayurveda covers fats, lipid and adipose tissue; hence the disorders of these tissues can be considered as disorders of Meda dhatu. As per Ayurveda Medoroga involved Kapha dosha and Meda dhatu as a prime causative factor and Vata and Pitta are responsible for fatal complications.[10,11] Acharyas particularly mentioned if Meda is increased in very moderate quantity in body and remains untreated for long period may cause death of patient.[12]

On the basis of physiological consideration of Meda dhatu, circulating lipids are considered as Asthayi (Poshak) Dhatu and where as body fats or adipose tissue can be considered as Sthayi or Shthira Meda Dhatu. The term lipid is better to consider in relation to physiological aspect of fat where as adipose tissue to be considered in relation to anatomical aspect. In Medo Rogas all the etiological factors influence and disturb (Agnimandy) the Jatharagni primarily and then consequently Bhutagni and Dhatwagni, which causes excess formation of Apaachit or Saam Meda Dhatu. From above discussion it may be stated that Obesity (Sthoulya) is a disease of Apaachit or Saam Sthayi medo dhatu Vriddhi and Dyslipidemia (Medo roga) is a disease of Apaachit or Saam Asthayi Meda Dhatu Vriddhi.

Management Principle for Dyslipidemia (Medo Roga)

Dyslipidemia (Medo roga) is a disease of diminished Jatharagni and Dhatwagni induced Apachita or Saam Asthayi Meda Dhatu Vriddhi. Bhutagni is the link between Jatharagni and Dhatwagni, means all three Agni are diminished. So for the management of Dyslipidemia (Medo roga) such drugs are needed which having Deepan, Pachan, Kaphaghna and Medoghna properties. Acharya Charak advises to use Guru and Apatarpan medicines, which are having Shleshma-Medohara properties and Vataghna diet in the management of Atishhauya. Various treatment modalities like diet and life style modification, conservative treatment and Panchkarma procedures are mentioned in Ayurveda for management of Medo Rogas.[13] Beside these, wide varieties of causes of Dyslipidemia (Medo roga) connote the use of specific lipid lowering drugs as per the etiological factors. For the effective management of lipid disorders it is mandatory to use such drug which has potential pharmacological action on exact etiological factor.

Pharmacological and clinical studies have reported that Ayurvedic herbal medicines are effective in lowering LDL-C.[14] Ayurvedic lipid lowering herbs are depicted as per their pharmacological action at specific pathogenesis level. So while managing Dyslipidemia (Medo roga) specific herbs has to be used as per the various causative acquired factors.

In this regards it is time essential to classify them by considering its specific therapeutic effect and not only by using as a indistinct lipid lowering agent. It is rationale to use Ayurvedic lipid lowering herbs against specific involved Samprapti Ghatak (pathological factor) in the management of Dyslipidemia (Medo roga).

Drug useful in Dyslipidemia (Medo roga) might have below properties

1) Drug must have Deepan, Paachan properties with Ushna Virya (potency).
2) It has action on all varieties of Agni i.e. Jatharagni (GIT level), Bhutagni (Hepatic metabolism level) and Dhatwagni (various body tissue metabolism level).
3) It has capacity to digest the Rasa Rakta gata apaachit saam Meda.
4) It has to be safe for long term use.
5) At the same time it also minimizes the future complications by the property of Urtjaskar (Rasayan and Vrishya).

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Classification of enlisted Ayurvedic lipid lowering herbs according principle of Ayurveda

On these backgrounds after in depth study for classification of Ayurvedic lipid lowering herbs principles of Samhitas, qualities and pharmacological actions mentioned in various Nighantus and pharmacological research evidences are taken in consideration. We try to classify it according to therapeutic effect at various level of Samprapti Ghatak (pathological factor) of Dyslipidemia (Medo roga).

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Disease Condition</th>
<th>Useful Herbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Obesity (Sthoulya) - Apaachit or Saam Sthayi medo dhatu vriddhi</td>
<td>Guggulu (Commiphora mukul)[15], Vidanga (Emblica ribes)[16], Triphala (Three fruits)[17], Amara Bela (Cascatu refexa).[18]</td>
</tr>
<tr>
<td>2.</td>
<td>Dyslipidemia (Medo roga) Apaachit or Saam asthayi meda dhatu vriddhi</td>
<td>Jeerak (Cuminum cyminum)[19], Guduchi (Tinospora cordifolia)[20], Amalaki (Emblica officinalis)[21], Chavya (Piper chaba)[22], Haridra (Curcuma longa)[23], Musta (Cyperus rotundus)[23], Arjun (Terminalia arjuna)[24], Palandu (Allium cepa)[25], Erandamoola (Ricinus communis root).[26]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Samprapti Level</th>
<th>Therapeutic Action</th>
<th>Lipid Lowering Herbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jatharagni</td>
<td>Agni Deepan, Paachan</td>
<td>Chavya (Piper chaba)[22], Jeerak (Cuminum cyminum)[19], Trikatu (Three peppers)[27], Sunthi (Zinziber officinale)[28]</td>
</tr>
<tr>
<td>2</td>
<td>Bhutagni</td>
<td>Bhutagni deepan (Agni + Vaayu)</td>
<td>Kutki (Picrorhiza kurroa)[29], Bhringraj (Eclipta alba)[30], Bhunimba (Andrograhis paniculata)[31], Daruharidra (Berberis aristata)[32]</td>
</tr>
<tr>
<td>3</td>
<td>Dhatwagni</td>
<td>Dhatwagni Deepan, Paachan</td>
<td>Chavya (Piper chaba)[22], Jeerak (Cuminum cyminum)[19], Trikatu (Three peppers)[27], Arjun (Terminalia arjuna)[24]</td>
</tr>
<tr>
<td>3.1</td>
<td>Rasa dhatu</td>
<td>Rasa Dhatwagni Deepan, Paachan</td>
<td>Kutki (Picrorhiza kurroa)[29], Bhringraj (Eclipta alba)[30], Bhunimba (Andrograhis paniculata)[31], Patola (Trichosanthes dioica)[33], Sariva (Hemidesmus indicus)[34], Haridra (Curcuma longa)[23]</td>
</tr>
<tr>
<td>3.2</td>
<td>Rakta Dhatu</td>
<td>Rakta Dhatwagni Deepan, Paachan</td>
<td>Nimba (Melia azadirachta)[35], Triphala (Three fruits)[17], Musta (Cyperus rotundus)[23]</td>
</tr>
<tr>
<td>3.3</td>
<td>Mamsa Dhatu</td>
<td>Mamsa Dhatwagni Deepan, Paachan</td>
<td>Nimba (Melia azadirachta)[35], Triphala (Three fruits)[17], Musta (Cyperus rotundus)[23]</td>
</tr>
<tr>
<td>3.4</td>
<td>Meda Dhatu</td>
<td>Meda Dhatwagni Deepan, Paachan</td>
<td>Kirattikta (Swertia chirata)[36], Sunthi (Zinziber officinale)[28], Guduchi (Tinospora cordifolia)[20], Rasona (Allium sativum)[37], Eranda moola (Ricinus communis root)[26]</td>
</tr>
<tr>
<td>4</td>
<td>Upadhatu</td>
<td>Paachan + Dhatwagni deepan</td>
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Medo roga as per the


DISCUSSION
Classification of Ayurvedic lipid lowering herbs according to research evidences

Herbal plant lowers lipid by virtue of various pharmacological actions exerts by their active constituents i.e. saponins, tannins, alkaloids, alkenyl phenols, glycol-alkaloids, flavonoids, sesquiterpenes lactones, terpenoids and phorbol esters.[42] As per the pharmacological research evidences, herbs may be classified on their properties like LDL lowering, HDL elevating, inhibition of HMG CoA reductase enzyme and LDL oxidation property.

Herbs like Lomaphala (Passiflora foetida), Chakramard (Cassia tora seeds), Shunthi (Zingiber officinale rhizome), Bhumimba (Andrographis paniculata leaves), Mandukparni (Centella asiatica leaves), Kembuka (Costus speciosus), Methika (Trigonella foenum-graecum seeds), Isabgol (Plantago ovata seeds) are having low density lipoprotein lowering property.[43-47]

Some herbs are possessing both LDL lowering and HDL elevating properties like Ajamoda (Apium graveolens seeds), Bilva (Aegle marmelos leaves), Sarshap (Brassica juncea seeds), Erandakarkati (Carica papaya fruit), Vidanga (Embelia ribes fruits), Mundi (Sphaeranthus indicus), Khadira (Acacia catechu leaf), Amar bela (Cucus reflexa), Guggulu (Commiphora mukul gum resin) and Kalonji (Nigella Sativa Seeds).[43,48-51]

Research studies investigate that herbs are also having statin like properties of inhibition of HMG CoA reductase enzyme. It decreases cholesterol synthesis by inhibition of rate limiting HMG CoA reductase enzyme. These herbs are Plaksha (Ficus virens bark), Lodhra (Symlocos racemosa bark), Amalaki (Emblica officinalis fruits), Ashok (Polyalthia longifolia leaves) and Alabu (Lagenaria siceraaria).[43]

Oxidative damage by free radicals has been concerned as the ground of diverse diseases. Numerous evidence from the conducted studies put forward that oxidation of LDL plays a key role in pathogenesis of atherosclerosis. Tulsi (Ocimum basilicum), Kanchanar (Bauhinia variegate flower), Haridra (Curcuma longa rhizome), Teela (Sesamum indicum seeds), Avartaki (Cassia auriculata leaves) and Draksha (Vitis vinifera fruit) are lowers lipids by acting on LDL oxidation.[43,52,53]

Some herbs are versatile in properties having LDL lowering, HDL elevating and LDL oxidation properties like Jamun (Syzygium cumini seeds) and Samudrashoka (Salvia officinalis leaves). Lahsuna (Allium sativum fruits) lowers lipids by all above properties.[43]

CONCLUSION

Each drug has specific pharmacological actions like some herbs are acting on Jatharagni, some on Bhutagni, some on Dhatwagni, some directly acting on Meda dhatu and at many more level as per Ayurveda. Study provides good evidence of classification of Ayurvedic lipid lowering herbs in the management of Dyslipidemia (Medo roga) as per Ayurveda and research evidences.

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