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Research Article

''*SINGLE HERBAL DRUGS IN THE MANAGEMENT OF ASTHIKSHAYA (OSTEOPOROSIS): A REVIEW*''

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ABSTRACT

Ayurveda is a "Divine science" due to its origin as well as its incredible strength. According to *Ayurveda dosha, dhatu and mala* are responsible factors for *utpatti, sthiti and laya* of human body. The function of *dhatu* is *dharana* of the *sharira* (body). Among *the dhatu, asthidhatu* is responsible for maintenance of structural frame work of the body. According to the principles of *ashrayaashrayibhava, asthidhatu* is the *sthan* of *vata doṣha* and they are inversely related to each other. Increase of vata is the main factor responsible *for asthikṣhaya. Asthikshaya* can be compared with osteoporosis. Though different treatment modalities are commonly used in modern medicine, there is no treatment which has satisfactory improvement without side effects. The present study was taken to analyze the fundamental concept of *asthikshaya* and to find out single herbs beneficial for it. In this paper efforts have been made to compile the drugs having anti-osteoporotic activity and classified them into *Dhatukshaya* and *Margavarodhjanya samprapti* of *vataprakop.*

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Keywords: *Vata doṣha, Asthi kṣaya, Ashrayashrayibhava, Herbal drug*

INTRODUCTION

Acharya Sushruta has explained in sutrasthan "*Dosha dhatu mala mulam hi Shariram*". The function of dhatu is dharana of the Sharira. Asthi is blessed with the function of Sharira dharana,which gives shape to the body and protects the vital organs. Asthi kshaya is a condition in which there is decrease in the Asthi dhatu (Bone tissue). It can be compared with Osteoporosis in which there is decrease in the Bone Mineral Density (BMD) leading to increased risk of fractures. The plants compiled in this paper are studied experimentally for its anti-osteoporotic activity and found effective in the management of osteoporosis. The findings of present review highlight the use of these single and simple herbal remedies for the treatment of patients suffering from osteoporosis and can give a lead to further extensive research on these drugs.

Asthi Dhatu Guna & Karma :

Asthi dhatu is made up of Prithvi mahabhut. Asthi is sthira, khara, kathina due to Prithvi and ruksha, sushir

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due to Vayu mahabhut. Its function is deha dharana, Majja pushti & it is the sthan of Vata.

Etymology of Asthi Kshaya :

The word Asthi Kshaya is composed of two words Asthi and Kshaya. The word Asthi is derived from the root 'As' + 'Kthin' meaning "To Stay" or in the sense of "Stability". '*Kshiyate anena iti Kshaya*' .That which decreases is called as Kshaya or the kriya which causes the decrease either qualitative or quantitative is termed as Kshaya. Hence the combined meaning of Asthi kshaya is decrease in bone tissue. Increase of vata is the main factor responsible for asthikṣhaya.

Osteoporosis:

The term "*Osteoporosis*" was coined by *Pommer* in 1885 which literally means "porous bones". According to WHO osteoporosis is defined as "a systemic skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissue leading to enhanced bone fragility and a consequent increase in fracture risk". DEXA scan is considered the gold standard for the diagnosis of osteoporosis. Osteoporosis is diagnosed when the BMD is less than or equal to 2.5 standard deviations below that of a young (30–40-year-old).

AIMS AND OBJECTIVES

1. To study single herbal drugs which can be used in management of asthikshaya from classical texts and research articles.
2. To study osteoporosis in detail.
3. To study asthikshaya in detail.

MATERIALS AND METHOD:

The material for the current study was collected from various scientific databases such as PubMed, different published research articles and from classical texts.

1.Daruharidra (Berberis aristata DC.)-

The OVX rats were received standard estrogen (0.0563 mg/kg) and 100,300 or 500 mg/kg aqueous-methanol extract of B.aristata daily for 42 days which strongly suggest B.aristata possess the potent antiosteoporotic activity in OVX rats.[1]

2.Guduchi (Tinospora cordifolia Willd.)-

OVX rats treated with TC (10 mg/kg b.wt.) for 4 wks showed an osteoprotective effect.[2]

3.Asthishrunkhala (Cissus quadrangularis Linn.)- Treatment with 100,200,300 ug/ml petroleum ether extract of C.quadrangularis enhanced the differentiation of marrow mesenchymal stem cella into ALP- positive osteoblasts and increased extracellular matrix calcification.[3]

4.Aamalaki (Emblica officinalis Gaertn.)-Emblica officinalis extacts act by interfering with NF-Kb activity, a transcription factor involved in osteoclast biology.[4]

5.Dadim (Punica granatum Linn.)-The phytoestrogenic compounds in the medicine have potential prophylaxis and treatment of menopausal vasomotor phenomena, osteoporosis,oestrogen depletement cardiovascular disease and cancer raises the possibility that pomegranate seed oil and extracts might be employed in menopausal women as external and internal phytoestrogenmedicaments alternative for HRT.[5]

6.Shatavari(Asparagus racemosus Willd.)- Methanolic and aqueous extract obtained from A.racemosus root has shown significant effect on

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mineralization,ossification, and osteoclastic activity suppression were observed in histopathological examination.[6]

7.Ashwagandha (Withania somnifera Dunal)- Effect of Withania somnifera root ethanolic extract has been evaluated for anti–osteoporotic activity in ovariectomized Sprague– Dawley rats. Extract at the dose of 65 mg/kg for 16 weeks has shown a significant increase in serum alkaline phosphatase levels and urinary calcium and phosphorus excretion. Histological findings has revealed narrowed, and disappearance of trabeculae with widened medullary spaces in the ovariectomized group.[7]

8.Haridra (Curcuma longa Linn)- Curcumin has been reported to affect osteoclastogenesis and osteoblast proliferation and activity in vitro. Extracts prepared from Curcuma longa L., containing bioactive phenolic curcuminoids was evaluated for bone–protective effects in a hypogonadal rat model of postmenopausal osteoporosis.[8]

9.Jeerak (Cuminum cyminum Linn)- The antiosteoporotic activity of Cuminum cyminum was evaluated in rats. OVX and sham control groups were orally administered with vehicle while the other two OVX groups were administered 0.15 mg/kg estradiol and 1g/kg of methanolic extract of Cuminum cyminum fruits (MCC) in two divided doses for 10 weeks. It shows reduced urinary calcium excretion and significantly increased calcium content and mechanical strength of bones in comparison to OVX control[9].

10.Kantakari (Solanum xanthocarpum Schrad. & Wendl.)-Aqueous extract of Solanum xanthocarpum shows anti-osteoporotic effect.[10]

11.Guggul Commiphora mukul Hook ex Stocks)- Methanol extract of dried exudate of Commiphora mukul shows significantly increased levels of serum Ca.[11]

12. Sariva (Hemidesmus indicus Linn)-Hemidesmus indicus root extract prevents bone loss in OVX induced osteoporosis without estrogen like side effects.[12]

13.Manjishtha (Rubia Cordifolia Linn)–Root extract of Rubia Cordifolia shows antiosteoporotic activity in Ovariectomized Rats.[13]

14.Arjun (Terminalia arjuna Roxb.)-Ethanol extract of Terminalia arjuna (Roxb.) shows antiosteoporotic activity in Ovariectomized Rats.[14]

RESULT AND DISCUSSION :

As we know asthidhatu is the sthan of vata doṣha and they are inversely related to each other, vitiation of vata is the main factor responsible for asthikṣhaya. Vata prakop is either due to dhatukshaya or margavarodh. So drugs having properties like Madhur, Sheet, Guru, Snigdha will do brihana of asthidhatu and do samprapti bhang of asthikshaya. Hence drugs like Guduchi, Amalaki, Dadim, Shatavari, Ashwagandha, Asthishrinkhala, Sariva can be given in dhatukshayajanya asthikshaya. Drugs having properties like Katu, Tikta, Ushna will clear the strotas and increase Asthidhatwagni. Hence drugs like Daruharidra, Haridra, Jeerak, Guggul, Kantakari, Manjishtha, Arjun can be given in Margavarodhajanya asthikshaya.

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Rasapanchak of drugs acting on Dhatukshaya shown in table no.1

Sr no	Drug	Latin name	Rasa	Vipak	Virya	Guna
1	Sariva	Hemidesmus indicus Linn	MT	M	S	G,S
2	Guduchi	Tinospora cordifolia Willd	TCK	M	U	S,Mr
3	Asthishrinkhala	Cissus quadrangularis Linn.	M	M	U	L,R
4	Amalaki	Emblica officinalis Gaertn.	AMCTK	M	S	L,R
5	Dadim	Punica granatum Linn.	M	M	An	L,S
6	Shatavari	Asparagus racemosus Willd.	M	M	S	G,S
7	Ashwagandha	Withania somnifera Dunal	M	M	U	L,S

Table no.1

Rasapanchak of drugs acting on Margavarodh is shown in table no.2

Sr no	Drug	Latin name	Rasa	Vipak	Virya	Guna
1	Daruharidra	Berberis aristata DC.	TK	C	U	L,R
2	Haridra	Curcuma longa Linn	CT	C	U	L,R
3	Jeerak	Cuminum cyminum Linn	C	C	U	L,R
4	Guggul	Commiphora mukul Hook ex Stocks	TC	C	U	L,R
5	Kantakari	Solanum xanthocarpum Schrad. & Wendl.	TC	C	U	L,R,TI
6	Manjishtha	Rubia Cordifolia Linn	TKM	C	U	G,R
7	Arjun	Terminalia arjuna Roxb.	K	C	S	L,R

Table no.2

M-Madhur,A-Amla,L-Lavan,C-Catu,T-Tikta,K-Kashay

L-Laghu,R-Ruksha,G-Guru,S-Snigdh,TI-Tikshna,Mr-Mrudu

CONCLUSION:

Osteoporosis is the most common metabolic bone disorder. This condition seriously hampers the quality life of individual and needs an effective treatment measure without any adverse effect. The present study concludes that drugs having properties like Madhur, Sheet, Guru, Snigdha can be given in dhatukshayajanya asthikshaya whereas drugs having properties like Katu, Tikta, Ushna can be given in margavarodhjanya asthikshaya. All these drugs are easily available, simple for administration and devoid of any adverse reactions. Further clinical studies can

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be planned to establish their role in the effective management of osteoporosis in clinical practice.

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