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लाभानां श्रेय आरोग्यम्

Of all the gifts,
the most precious is health

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Aryavaidyan is intended to encourage scientific writing and intellectual interactions among scholars, academicians, practitioners and students of ayurveda and allied subjects like Siddha, Unani, modern medicine, etc.

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PHARMACOGNOSTICAL EVALUATION OF *CARISSA CARANDAS* LINN. ROOT

V.H. Bhaskar* and N. Balakrishnan**

Abstract: *Carissa carandas* (Apocynaceae) has been used as a traditional medicinal plant over thousand of years in various system of medicine. It is a large shrub with simple thorn commonly called as 'karaunda'. The present study includes macroscopic, microscopic, powder analysis, moisture content, ash and extractive values of the root material. The preliminary phytochemical screening of root extracts showed presence of various phytoconstituents like alkaloids, glycosides, tannins, and terpenoids.

Introduction

The plant *Carissa carandas* (Apocynaceae)[1] is an indigenous evergreen shrub or small crooked tree up to 3 m in height with dichotomous branches; light green, elliptic or elliptic–oblong leaves; white or pink, faintly scented flowers in terminal corymbose cymes and ellipsoid; purple or pink and white, normally 8 seeds berries[2]. It is distributed to throughout India in dry, sandy and rocky grounds[3]. *Carissa carandas* is considered as one of the most valuable drugs in various system of medicine and all the parts of this plant are highly useful especially its root (Fig. I). Traditionally it is used in the treatment of scabies, intestinal worms, pruritus, biliousness and used as antiscorbutic, anthelmintic[2, 3]. The various pharmacological activity were reported on this plant like analgesic, anti inflammatory[4], anti pyretic[5], cardiotonic[6] and histamine releasing[7].The reported phytoconstituents were fixed oil, volatile oil, resin, alkaloid[3], triterpenoid[8], carissol ,carissic acid[9] and ursolic acid[10]. In the view of its enormous medicinal value in various system of medicine, our efforts were devoted to standardize the pharmacognostical parameters of the root *Carissa carandas*.

Materials and method

Collection

The plant materials, collected from Maruthamalai Hills, Coimbatore District, India were taxonomically identified by Plant Anatomy Research Centre, Chennai, Tamilnadu, India. Care was taken to select healthy plants and the required samples of roots were cut and removed from the plant and fixed in FAA (Farmalin-5ml + Acetic acid -5ml + 70% Ethyl alcohol - 90ml). After 24 hours of fixing, the specimens were

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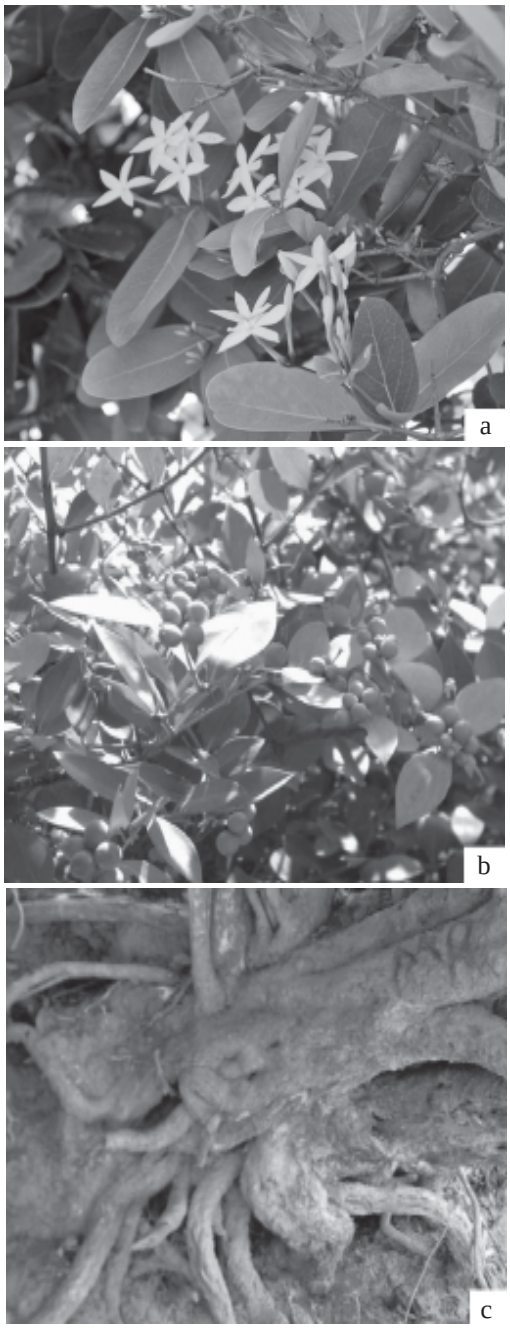


Fig. I. *Carissa carandas* Linn.
a Flowers; **b** Leaves & berries; **c** Root

dehydrated with graded series of tertiary-Butyl alcohol[11]. Infiltration of the specimens was carried by gradual addition of paraffin (melting point 58-60ºC) until TBA solution attained super saturation. The voucher specimen (PARC/2007/53) has been preserved in our laboratory for further reference.

Pharmacognostical studies

The morphological characters of the root were identified based on the shape, size, colour, surface, fracture and appearance of cut surface[12]. In microscopical evaluation, the paraffin embedded specimens were screened with the help of Rotary Microtome and the thickness of the sections was 10-12 ì m. Dewaxing of sections was by customary procedure[13] and the sections were stained with Toluidine blue method[14]. Powdered material of root was cleared with sodium hydroxide and mounted in glycerin medium after staining with pholoroglucinol and hydrochloric acid.

Photomicrographs

Photographs of different magnifications were taken with Nikon Labphot2 Microscopic Unit. For normal observations bright field was used. For the study of crystals, starch grains and lignified cells, polarized light was employed. Since these structures have birefringent property, under polarized light they appear bright against dark background. Descriptive terms of the anatomical features are as given in the standard Anatomy books[15].

Phytochemical studies

The roots were dried under shade, powdered with a mechanical grinder and pass through sieve no 40.The sieved powder was stored in airtight container and kept in room temperature

for further study. The dried and powdered material (250g) was extracted with petroleum ether, chloroform, ethyl acetate, ethanol and water (cold maceration) successively in a soxhlet apparatus. The solvents were completely removed under reduced pressure by using vacuum evaporator. All extracts were subjected to phytochemical tests in order to identify the nature of chemical constituents present in the plant material[16, 17].

Physicochemical analysis

The dried and powdered material was subjected to physicochemical analysis like moisture content, total ash, water soluble ash, acid insoluble ash, alcohol soluble extractive and water soluble extractive to determine the quality and purity of the plant material[17, 18].

Fluorescence characteristics:- When physical and chemical parameters are insufficient as it often happens with the powdered drugs, the plant material was identified from their fluorescence characters [19, 20].

Observations and results

Macroscopical characters

The macroscopical studies revealed that the roots were 0.5-1.5 m long and 10-15 cm in diameter, irregularly bent, woody, and cylindrical with numerous lateral roots of 0.2-0.4 m long and 3-5 cm in diameter. Outer surface was irregular fissures, smooth and buff to grey in colour. Odour and taste is not distinct.

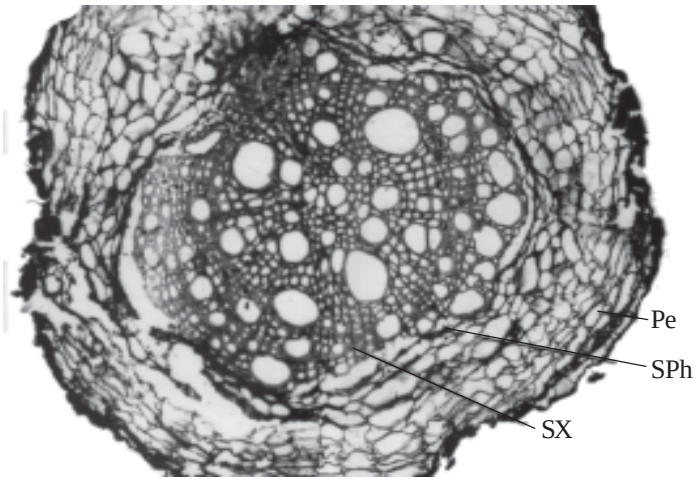
Anatomical characters

Thin root:- It is 2.5mm thick. It has wide, continuous periderm with dark crest on the surface. It is 300ìm wide; it consists of two or more layers of thick walled, lignified cells called phelloid, these layers alternate with thin walled, suberised phellem cell layers. The cortex is narrow and consists of two or three layers of compressed parenchyma cells. Secondary xylem is solid cylinder with wide and narrow vessels diffusely distributed in the xylem fibres.The vessels thin walled, circular and solitary. The wide vessels are 80 ìm in diameter. The xylem fibres are thick walled and lignified. (Fig. IIa&b)

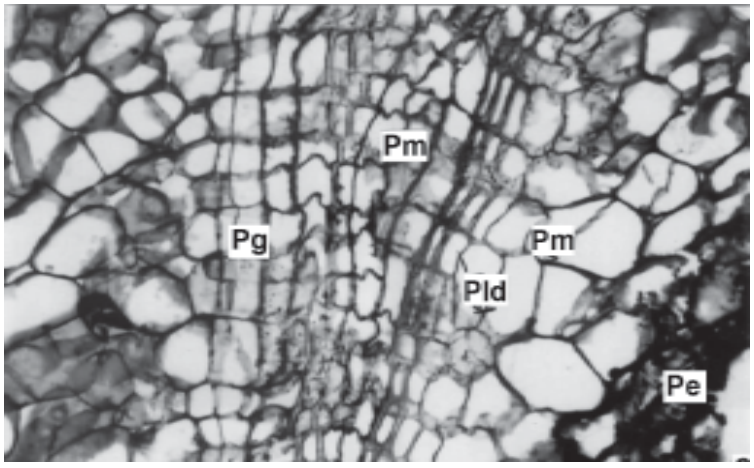
Thick root: - It is 4mm in diameter; it consists of the four zones: i) Periderm: It is wide and continuous, has deep, regular and irregular fissures; it is 200 ìm wide; consists of suberised, tabular phellem cells, ii) Cortex: It is narrow and has 4-7 layers of randomly oriented parenchyma cells; the cells are compact. iii) Secondary phloem: It is 350 ìm wide and continuous all around the stem. The phloem rays are prominent, undilated and consists of tangentially oblong cells. The sieve elements in the outer part are collapsed in to dark thin tangential streaks. In the inner zone the sieve elements are intact, in radially arranged files and v) Secondary xylem: Secondary xylem is wide dense. It has three or four distinct growth rings. The growth ring boundaries are demarcated by narrow lines of thick walled fibres and narrow vessels. The vessels are ring porous; the vessels in the beginning of the growth ring are wide and aggregated in tangential multiples.The early wood vessels are 150 ìm wide, the late wood vessels are 40 ìm wide. The vessels circular to ovate, solitary, thick walled and open. The xylem fibres are thick walled and narrow lumen. (Fig. III)

Microscopic characters

The macerated preparation of the root showed vessels elements, tracheide and fibres. i) Vessels



a



b

Fig. II a&b: *Carissa carandas* Linn. - Anatomy of the thin root
a) T.S. of entire view; b) T.S.of sector enlarged

Pe Periderm; **SPh** Secondary Phloem; **SX** Secondary Xylem;
Pm Phellem; **Pg** Phellogen; **Pld** Phelloderm.

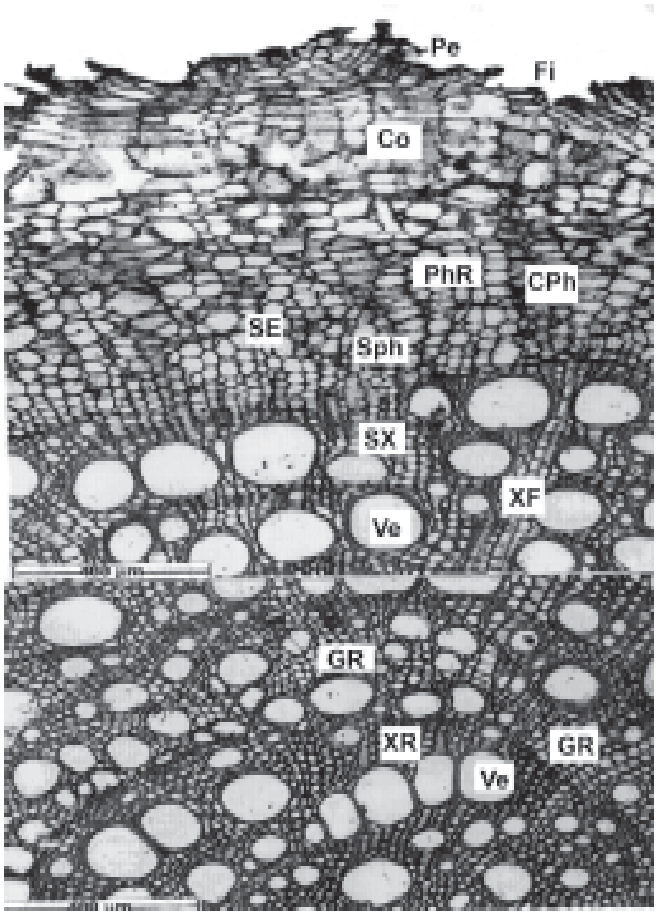


Fig. III: *Carissa carandas* Linn. - Anatomy of the thick root

Fi Fissure; **Pe** Periderm; **Co** Cortex; **PhR** Pholem ray; **CPh** Collapsed phloem; **SE** Sieve element; **SPh** Secondary Phloem; **SX** Secondary Xylem; **XF** Xylem Fibres; **Ve** Vessel; **GR** Growth ring; **XR** Xylem parenchyma.

elements: The vessels elements are long and cylindrical. Most of them have tails at one or both ends. They have simple perforation plate which may be horizontal or oblique. The lateral wall pits are elliptical, dense and occur in many vertical rows. The vessels are 450 ìm to 1.05 ìm long. ii) Tracheids: They are fairly wide, short and densely pitted cells; similar to vessels and lout lack the perforation plate. The tracheids are up to 600 ìm long and thicker walls. iii) Fibres: They are longer and thicker walled than tracheids; have lumen and the ends are tapering. The lateral wall pits are simple and in a single vertical row. Some of the fibres have no pits. The fibres are 600-750 ìm long and 10 ìm thick. iv) Xylem parenchyma: The xylem parenchyma cells are seen in powder. They are square shaped or rectangular and has thick walls and abundant simple pits. v) Brachy sclereids**:** They are sparingly seen in the powder, isolataral and irregular in shape. They have thick walls, wide lumen and canal like simple pits. (Fig. IV-VI)

Phytochemical screening

Preliminary phytochemical screening of the various extracts of root showed positive results for the presence of steroids, flavonoids, tannins, alkaloid and glycosides and percentage yield of extracts was calculated (Tables 1&2)

Physicochemical analysis

The ash values revealed that the root of *Carissa carandas* has not more than 6.35% w/w of total ash, not more than 0.5 % w/w of acid insoluble ash and not more than 3.8 % w/w of water soluble ash. The water soluble extractive value is not less than 8.6 w/w and the alcohol soluble extractive value not less than 5.5 % w/w. The moisture content of the root material was 4.5 % w/w (Table-3). The fluorescence analysis of powder is presented in Table 4.

TABLE 1
Screening of *Carissa carandas*.L root extracts

Phytochemicals	P	C	EA	E	W
Alkaloids	-	+	-	+	+
Glycosides	-	-	-	+	+
Steroids	-	+	+	+	+
Flavonoids	-	+	+	+	+
Tannins &Phenolic Compounds	-	+	-	+	+
Terpenoids	-	-	+	+	+
Carbohydrates	-	-	-	+	+
Fixed oils &Fats	+	-	-	-	-
Proteins & Free amino acids	-	-	-	-	-
Gums&Mucilage	-	-	-	+	+
Saponins	-	-	-	+	+

P - Petroleumether; C = Chloroform; EA - Ethyl acetate; E - Ethanol; W - Water

Discussion

Pharmacognostical studies of any phyto drug are the primary steps to establish its botanical quality control before going to other studies. The root is 0.5-1.5m long and 10-15cm in diameter with numerous lateral roots. An anatomical study of root gives more details of the periderm, cortex, secondary phloem and secondary xylem. Powder analysis of root

TABLE 2
Percentage yield of successive extracts

Extract name	% yield (W/W)	Colour of extract
Petroleum ether	1.12	Slight brownish yellow
Chloroform	3.56	Brownish yellow
Ethyl acetate	2.86	Yellowish brown
Ethanol	7.45	Reddish brown
Water	8.10	Brownish black

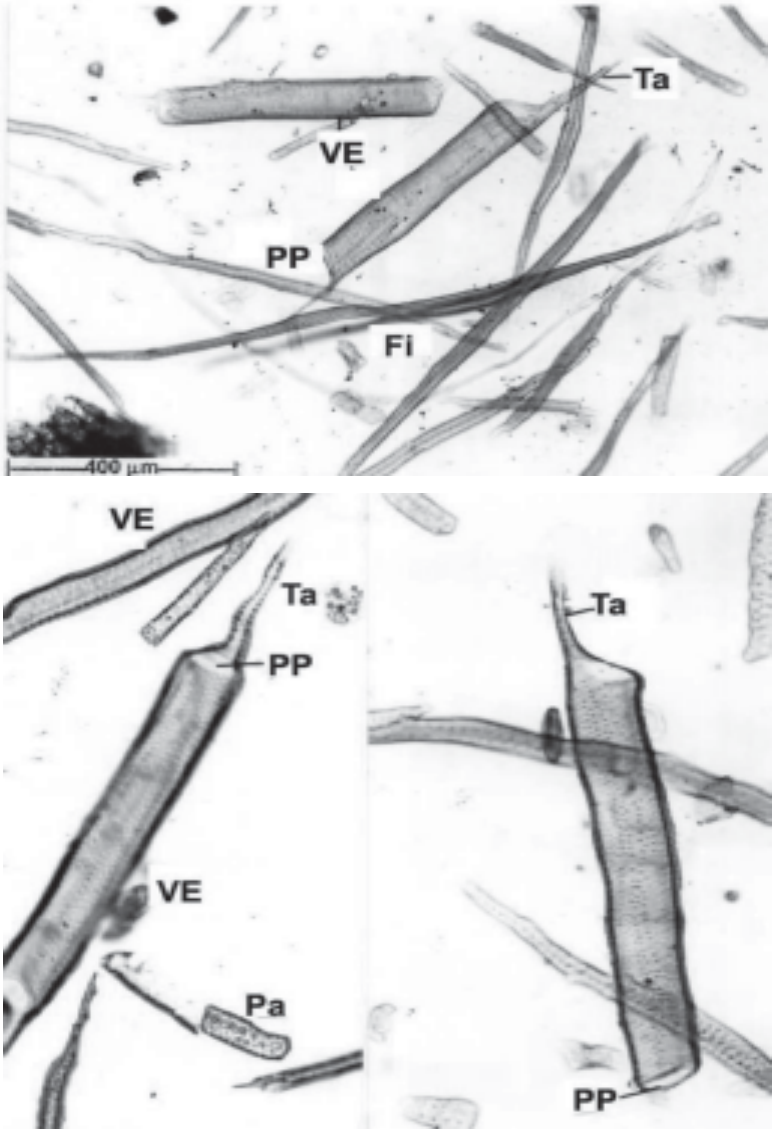


Fig . IV: Powder microscopy of the root

Ta Tailed vessel elements; **VE** Vessel element; **PP** Perforation plate; **Fi** Fibres; **Pa** Parenchyma cells.

Fig .V: *Carissa carandas* Linn. - Powder microscopy of the root
Tr Tracheids; **Fi** Fibres; **Sc** Sclereids; **Pa** Parenchyma cells.

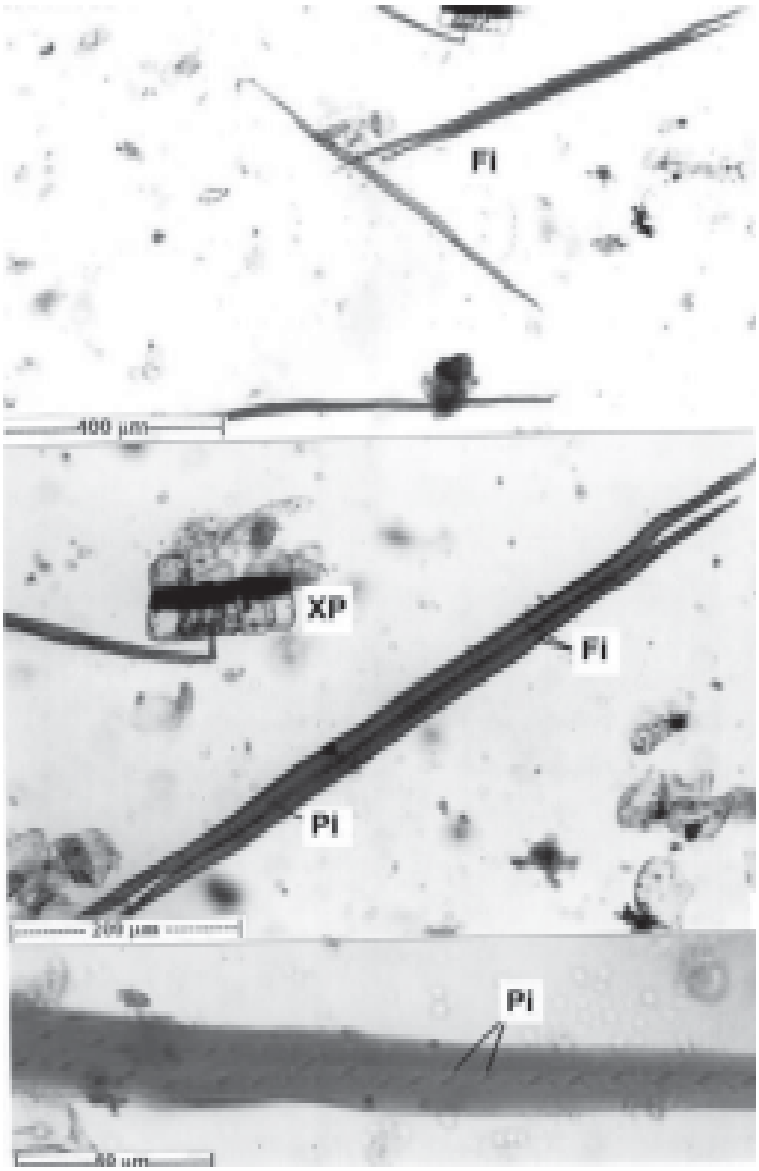


Fig.VI: *Carissa carandas* Linn. - Powder microscopy of the root

Fi Fibres; **XP** Xylem Parenchyma; **Pi** Pits.

TABLE 3
Physicochemical analysis (% W/W)

Parameters	Values Mean (n=3)±SD
1. Moisture content	4.533 ± 0.0577
2. Ash value:	
- Total ash	6.33 ± 0.0166
- Acid insoluble ash	0.47 ± 0.0145
- Water soluble ash	3.75 ± 0.0288
3. Extractive value:	
- Water soluble extractive	8.58 ± 0.0166
- Alcohol soluble extractive	5.47 ± 0.0145

TABLE 4
Fluorescence analysis of root powder

Treatment	UDL*	UVL*
Powder as such	Yellowish brown	Light-brown
Powder + 1N NaoH in methanol	Yellowish brown	Pale-yellow
Powder + 1N NaoH in water	Yellowish brown	Reddish yellow
Powder + 1N Hcl	Pale-yellow	Pale-yellow
Powder + 50% HNO_3	Reddish yellow	Red
Powder + 50% H_2SO_4	Yellowish green	Yellowish green

*UDL - Under Day Light; UVL - Under UV Light

material revealed that vessels elements, tracheids and fibres. The main phytoconstituents of the root material were found to be steroids, flavonoids, tannins, alkaloid and glycosides. Physicochemical analyses are helpful in authentification of the root of *Carissa carandas*. The study can be extended further to find out the various ethanopharmacological uses of this root material with animal study.

Acknowledgement
The authors are thankful to Prof. Dr.B.Jayakar, Principal, Vinayaka Mission College of Pharmacy, Vinayaka Mission University, Salem (TN) for providing necessary facilities to conduct this study and to Prof. Dr. A. Balasubarhamaniam, Director, Technocrats Institute of Technology-Pharmacy, Bhopal (MP) for his valuable guidelines and encouragement.

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EFFECT OF JAṬAMĀNSI IN CITTODVEGA (ANXIETY NEUROSIS)

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Abstract: Anxiety is the most prevalent psychiatric illness in general community and is present in 15 to 20% of patients. Cittodvega (anxiety-neurosis) is a psychosomatic problem. Although western medical science has a good number of effective psycho-pharmacological formulations to combat this problem, they have numerous side effects and problems of tolerance and dependence on repeated use. Keeping this in view, the present work was done to evaluate the efficacy of jaṭamānsi (*Nardostachys grandiflora*) in the management of cittodvega. A comparative study of psychometric tools between the groups showed that the medhya drug jaṭamānsi can be used as an effective drug for the management of anxiety-neurosis.

Introduction

Anxiety is an unpleasant emotional state, associated with uneasiness, discomfort and concern or fear about some defined and undefined future threat. Some degree of anxiety is a part of normal life but when the anxiety is disproportionate to the situation and excessive, presenting with somatic symptoms it is known as anxiety neurosis which needs management.

The term cittodvega is referred to in Caraka-samhita as one of the manodoṣavikāra, caused by the disturbances of rajas and tamas. It is very similar to anxiety-neurosis both etiologically as well as clinico-pathologically. Literally the word cittodvega derives from two words, citta and udvega. Citta refers to the mind (psyche) and udvega to clinical agility or neurosis. Recent studies reveal the life-time prevalence of anxiety-neurosis as 4.1-6.6%. It is more common in women than in men. The male-female ratio is 1:2. The initial appearance of anxiety-neurosis is commonly seen in the early 20s though it can occur at any age. Studies support a familial basis for the disorder. There are many aetiological factors involved and all of them appear correct from specific angles. The aetiological factors are genetic and neurobiological (hypothalamic pituitary adrenal axis). In āyurveda the aetiological factors responsible for cittodvega are prakṛti, sattva, āhāra, prajñāparādha, asātmendriyārtha samyoga and pariṇāma.

Regarding the management of anxiety neurosis, both the modern medicine and āyurveda have three steps of management i) Non-pharmacological management ii) pharmacological management and iii) combination of both.

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Previously many clinical trials have been done with jaṭamānsi (*Nardostachys grandiflora*) showing its depressant action on the Central Nervous System (CNS) of guinea pigs and rats[1]. Marked relaxation in plain muscle, depression of CNS as mild degree of relaxation of skeletal muscles, along with a significant and sustained hypotensive action had been studied in dog[2]. The neuropharmacological profile of jaṭamānsi with special reference to its hyperkinetic states has been reviewed[3]. It was found that jaṭamānsi can reduce aggressiveness, restless-ness and stubbornness as well as insomnia[4]. Alcohol extract of the rhizome, showed a significant increase in 5-HT, HIAA, and GABA in rats[5]. Hence the present study was planned.

Material and methods

Selection of cases: - Forty cases were recruited selected from the Kayachikitsa O.P.D. and I.P.D. of Sir Sunderlal Hospital, I.M.S., B.H.U. Varanasi. Selection of cases was random regardless of age, sex, occupation and socio-economic considerations. The patients were screened for diagnosis clinically.

Exclusion criteria

- Patients with psychiatric disorders like schizophrenia, depressive illness, mania or bipolar disorders or psychotic disorders not otherwise specified.
- Drug effects, e.g. sympathomimetic agents, corticosteroids, etc.
- Drug withdrawal syndromes, e.g. barbiturates, tranquillizers, etc.
- Toxic causes like alcohol ingestion and withdrawal.
- Diseases of central nervous system such as vascular diseases, degenerative disorders, temporal lobe epilepsy, delirium and dementia.
- Endocrine or metabolic disorders, e.g. hypothyroidism or hyperthyroidism, hypoglycemia, hyperadrenocorticism, hypocalcemia, etc.
- Cardiovascular disease, pulmonary disorders, infections, etc.

Inclusion criteria

Patients who fulfilled the DSM-IV diagnostic criteria for Generalised Anxiety Disorder (GAD) were included in this study which is as follows:

- Excessive anxiety and worry, occurring more days than not for at least 6 months about a number of events or activities (such as work or school performance).
- The person finds it difficult to control the worry.
- The anxiety and worry are accompanied by at least 3 of the following 6 symptoms (in children): (1) restlessness or feeling keyed up or on edge, (2) being easily fatigued, (3) difficulty in concentrating or mind going blank, (4) irritability (5) muscle tension (6) sleep disturbance
- The focus of the anxiety and worry is not confined to features of an axis I disorder, e.g., the anxiety or worry is not about a panic attack (as in panic disorder) being embarrassed in public (as in social phobia), being contaminated (as in OCD), being away from home or close relatives (as in separation anxiety disorder), gaining weight, having multiple physical complaints as in somatization disorder or having a serious illness (as in hypochondriasis) and the anxiety and worry do not occur exclusively during PTSD (post traumatic stress disorder).
- The anxiety, worry or physical symptoms can cause significant distress or impairment

in social, occupational or other important areas of functioning.

Study groups:- Out of 40 registered patients, 34 patients turned up for full follow ups and the remaining 6 dropped out. Group A consisted of 16 patients who were under treatment by known anxiolytic drug. Group B consisted of 18 patients who were put on trail drug Jaṭamānsi hima kaṣāya.

Drug administration**:-** Group A - Alprazolam 0.5mg/day for 45days; Group B - Jaṭamānsi Hima kaṣāya 50ml - 12 hrly for 45days. Follow ups in each group was done after every 15 days.

Assessment criteria

A) Clinical observation**: -** It includes following symptoms: 1. insomnia, 2. irritability, 3. palpitation, 4. easy fatigue, 5. restlessness, 6. difficulty in concentrating, 7. tension headache, 8. dryness of mouth, 9. increased urinary frequency, 10. shortness of breath, 11. stomach upset and diarrhea, 12. unexplained fear and 13. trembling.

B) Psychological observation**:-** The effect of the treatment was also assessed in terms of certain psychological factors. The emphasis was put to the rate of reduction in anxiety level, depression level, change in the level of reaction time and immediate memory span. For this, the following psychological tests as per methods already described were applied to the patients on initial visit and on last follow up:

- Adjustment scale
- Immediate memory span
- Galvanic skin resistance
- Reaction time
- Hamilton anxiety rating scale
- Hamilton depression rating scale

C) Laboratory profile**:-** Routine blood examination. This includes Total Leucocyte Count (T.L.C.), Differential Leucocyte Count (D.L.C.), Hemoglobin Estimation and Erythrocyte Sedimentation Rate, SGOT/SGPT, Serum creatinine

Observation and results

The observation and results have been made on following aspects: i) demographic profile of cittodvega, ii) clinical profile, iii) psychological profile and constitutional profile and iv) inter group comparison of the collected data were compared group-wise and symptom-wise.

Out of 40 patients, 14 were male and 26 were female (Table 1). It was found that the patients of age group 16-20 years exhibited greater prevalence of cittodvega. The habitat of 40 patients was distributed in the ratio of 21 (52.50%) rural and 19 (47.50%) urban. Anxiety-neurosis has found to be more common in patients who had got education up to graduation; the incidence seems to be higher in educated class. Regarding deha-prakṛti, it is found 25 (62.50%) patients with vāta-pittaja prakṛti followed by 10 (25.00%) vāta-kaphaja and 15 (13.50%) pitta-kaphaja. This indicates that

TABLE 1
Incidence of age and sex

Age	M*	%	F*	%	Total	%
16-20	6	15.00	12	30.00	14	45.00
21-25	4	10.00	7	17.50	9	27.50
26-30	2	5.00	5	12.50	7	17.50
31-35	2	5.00	2	5.00	4	10.00
36-40	0	0	0	0	0	0
41-45	0	0	0	0	0	0
46-50	0	0	0	0	0	0
51-55	0	0	0	0	0	0
56-60	0	0	0	0	0	0
Total	14	35.00	26	65.00	40	100

*Male; Female

vāta-pittaja trait appears to be most vulnerable for cittodvega. On mānasa-prakṛti, it is found that majority of patients i.e. 28 (70%) were of rājasika-prakṛti and 12 patients (30%) of tāmasika-prakṛti. Maximum number i.e. 26 (65%) of patients was having āvara-sattva and 14 (35%) patients madhyama sattva.

In both the groups, statistically highly significant improvement was noticed in all the parameters (Table2&3). Inter-group comparisons on symptoms and psychometric observation reveals that both groups showed almost similar effect to the treatment (Table 4).

TABLE 4
Inter-group comparisons on symptoms

	Symptoms	(BT - AT)
1.	Insomnia	t = 0.23
2.	Irritability	t = 0.75
3.	Palpitation	t = 1.39
4.	Easy fatigue	t = 1.83
5.	Restlessness	t = 1.11
6.	Difficulty in Concentrating	t = 0.46
7.	Tension Headache	t = 0.83
8.	Dryness of Mouth	t = 0.26
9.	Increased Urinary frequency	t = 0.14
10.	Stomach upset & diarrhoea	t = 0.07
11.	Shortness of breath	t = 0.14
12.	Unexplained fear	t = 0.20
13.	Trembling	t = 0.44

p > 0.05 Not significant

Discussion

Jaṭamānsi is referred to in Bhāvaprakaśanighaṇṭu as a medhya drug. The drug is called medhya because it is especially beneficial for medha, the intellect, which is the seat of prajña, consists of dhi or buddhi, dhṛti and smṛti. Thus the medhya effect essentially refers to intellectual upliftment and promotion of intellectual component of mental health. Recent researches have explained that medhya drugs like gudūci, śankhapuṣpi, brahmi, mandūkparṇi, jaṭamānsi,

TABLE 2
Effect of trial treatments on different parameters

Description	Mean + SD					't'
	BT	F_1	F_2	AT	BT - AT	
1. ASS[1]						
GroupA	63.81±2.37	57.38±2.66	56.75±2.96	56.56±2.53	7.25±3.47	8.35*
GroupB	64.67±1.81	62.06±1.76	58.56±3.40	55.72±1.93	8.94±2.83	13.37*
2. GSRS[2]						
GroupA	380.94±17.34	513.13±110.54	632.06 ± 69.17	638.94±85.35	258.00 ± 83.00	12.38*
GroupB	375.50±11.52	388.06±17.52	576.06 ± 53.41	614.61±109.50	-239.00±111.32	9.11*
3. HARSS[3]						
GroupA	26.00±0.82	13.37±0.62	15.75 ± 0.68	16.19±0.83	9.81±1.10	35.40*
GroupB	25.83±0.92	20.83±1.10	16.28 ± 0.96	13.28±0.75	12.55±1.33	39.81*
4. HDRSS[4]						
Group A	12.00±0.82	7.94±0.77	8.44±0.73	8.56±0.81	3.43±1.03	13.34*
Group B	12.17±0.86	10.78±0.81	8.56±0.78	8.11±0.68	4.05±1.11	15.50*

* p<0.01 Highly significant; 1. ASS - Adjustment Scale Scores; 2. GSRS - Galvanic skin resistance scores; 3. HARSS - Hamilton Anxiety Rating Scores; 4. HDRSS - Hamilton Depression Rating Scale Scores.

TABLE 3
Effect of trial treatments on different parameters

Description	Mean			't' value
	BT	AT	BT - AT	
1. Immediate Memory Span Score				
Group - A	3.22 ± 0.41	5.00 ± 0.58	-1.78 ± 0.45	15.97*
Group - B	3.47 ± 0.12	5.19 ± 0.25	-1.72 ± 0.26	28.58*
2. Audio Visual Reaction Time				
Group - A	1.49 ± 0.03	1.01 ± 0.01	0.47 ± 0.02	93.20*
Group - B	1.48 ± 0.03	1.02 ± 0.01	0.46 ± 0.03	65.31*

* p<0.01 Highly significant

aśvagandha and vaca are having various psychotropic actions. These drugs decrease the level of catecholamines in the body and possess anti-anxiety, anti-stress and adaptogenic effect.

Conclusion

The present clinical study reveals that both jaṭamānsi and anxiolytic drug have statistically highly significant effect over anxiety-neurosis. Inter-group comparisons reveal that anti-anxiety effect of the medhya drug jaṭamānsi is slightly better than that of the the known anxiolytic group, where the effect of known anxiolytic group is gradually decreasing while that of jaṭamānsi is gradually increasing.

TABLE 5
Inter-group comparison (Group A vs. Group B) of psychometric observation

Unpaired 't' test BT-AT = difference					
AS	IMS	GSR	AVRT	HARS	HDRS
t=1.56	t=0.48	t=0.55	t=1.58	t=6.46	t=1.68
p>0.05	p>0.05	p>0.05	p>0.05	p<0.001	p>0.05
NS	NS	NS	NS	HS	NS

AS-Adjustment Scale; IMS-Immediate Memory Span; GSR-Galvanic Skin Resistance; AVRT- Audio Visual Reaction Time; HARS-Hamilton Anxiety Rating; HDRS-Hamilton Depression Rating Scale.

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Clinical observation

UTERINE MYOMAS

Chandrika Keeran*

Fibroids and myomata are the same, but correct terminology is leiomyoma. Tumours are spheroidal in shape and encapsulated. So they can be shelled out fairly early. They are usually multiple and may attain an enormous size.

Myomata are common in women between 35 and 45 and are rare below the age of 20. 30% are seen between 30-35 and are not infrequent in menopausal women. It is rare in women with large families and is common in women with no children or one child.

Aetiology

Little is known about the underlying cause. Ovarian hormone (oestrogen) has been considered an aetiological factor as these tumours arise in reproductive epoch and very commonly regress after menopause. Such regression may be attributed to the cessation of the ovarian function and diminished blood supply. Almost 35% of the women with myomata remain infertile. The interesting features of some young women reporting rapid enlargement of the myomata with the continued use of oral contraceptives suggested that the oestrogen containing pills might be the contributing factor. (Fig. I-VI)

Ayurvedic point of view

पित्तलिङ्गोऽसृजा बाह्यः स्त्रीणामेव तथान्तरः (अ.हृ. विद्रधि)

The external raktavidradhi shows all the symptoms of pittavidradhi. The internal raktavidradhi occurs only in women.

शस्त्राद्यैरभिघातेन क्षते वापथ्यकारिणः।

क्षतोष्मा वायुविक्षिप्तस्सरणं पित्तमीरयेत्।।

पित्तासृग्लक्षणं कुर्याद् विद्रधिं भूर्युपद्रवम्।

तेषूपद्रवभेदश्च स्मृतोधिष्ठाान भेदतः (अ.हृ. विद्रधि)

The vitiation of vāta following trauma by instruments, unwholesome food, etc. dissipates the heat from site and leads to the perturbation of pitta and rakta, the abscess shows features of the vitiation of pitta and rakta and leads to complications.

In consideration with the signs and symptoms it has been decided to start with some āyurvedic medicines, which are supposed to be anticancerous; effective in tumours, swelling and vāta perturbation.

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Case No.1 (S)

Unmarried; aged 22; reported on 14.02.08 with complaints of irregular and scanty periods. She was under allopathic treatment for hypothyroidism from 13.07.07. The following āyurvedic medicines were started and continued for 3 months.

1. Nimbāmṛtādi pañcatiktam kvātham tabs - 2 - 2
2. Pūvānkuruntila(sahadevi - *Vernonia cinerea*), whole plant ground well with water (10 g) early morning in empty stomach, just before taking the kvatham tabs.
3. Gandharvahastādi eraṇḍatailam - 5 ml at bedtime.

Now the patient has regular periods with scanty flow.

Case No.2 (V)

Married; aged 36; 3 pregnancies (3 live children; last child birth 12 years back); reported with complaints of irregular periods with menorrhagia. Periods occur within 3 weeks (i.e. cycles of 21-24 days) for about one year.

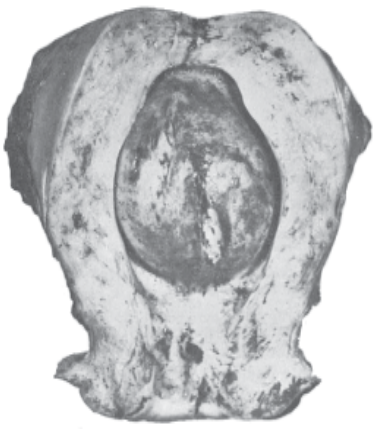

Fig. I. A submucous myomata

Fig. II. the uterus is on th eleft and three pedunculated subserous myomata on the right

07. 03. 07 - Ultrasonogram (USG):- Liver 16.6 cm; Hepatomegaly with fatty changes; Uterus 9.1 x 5.1 x 3.8 bulky; Endometrial thickness 6 mm; Multiple intra mural fibroids 3-8 mm; Pouch of Douglas (POD) clean.

Treatment given:-

1. Dhānvantaram (101) - 10 drops early morning in empty stomach.
2. Pūvānkuruntila - whole plant (ground well) - 10 g in the morning.
3. Gandharvahastādi eraṇḍatailam - 5 ml at bedtime.

13.11.07 - USG:- Liver 17 cm; Hepatomegaly with fatty changes; Uterus 7.9 x 4.6 x 3.8 cm; Normal size; Endometrial core 5 mm; Small anterior subserosal fibroid of 5 mm. Myometrial echotexture is heterogenous.

24.04.08 - USG: - Liver 16.6 cm; moderate fatty infiltration; Uterus 6.4 x 4.2 x 3.3cm, Normal size; Endometrial core normal; shows 2 hypo echoic round mass of size 5.4 mm and 3.4 mm. Ovary normal.

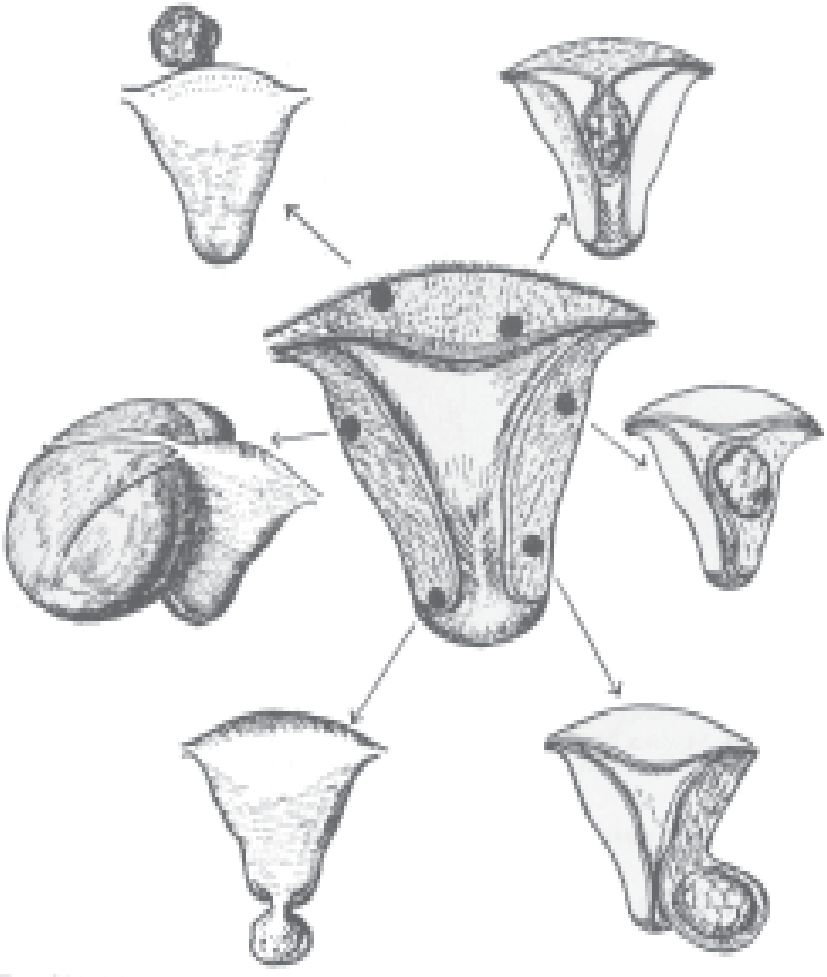

Fig. III. The development of the different types of uterine myomata (After Halban-Seitz)

At present, the patient is continuing with pūvānkuruntila only and her periods almost normal with normal bleeding. She is always on anti- hypertensive medicine.

Case No.3 (C)

Unmarried; aged 40 years; reported on 30.08.07 with complaints of 2 months amenorrhoea and irregular periods.

03.09.07 - Tablet Primolute N given to induce periods
16.09.07 - Periods started.
21.09.09 - USG: - Uterus anteverted; 7.7 x 4.4 x 4.0 cm; endometrial core 3 mm; multiple small subzerosal fibroids noted, measuring 6 - 8 mm.

Treatment given:

1. Nimbāmṛtādi pañcatiktam kvātham tabs - 2 - 2
2. Dhānvantaram gulika - 1 - 0 - 1
3. Sahadevi caps - 2 - 0 - 2
4. Gandharvahastādi eraṇḍatailam - 5 ml at bedtime.

24.12.07 - USG:- Essentially normal study; endometrial core 4 mm; uterus 6.8 x 3 x 2.8 cm.

Now the periods are normal with normal flow.

Case No.4 (N)

46 years; regular periods; 4 pregnancies (4 live children; last child birth 20 years back); Post partum sterilization done 20 years back; reported on 08.11.07 with severe backache. Per vaginal examination - bulky uterus, fornices free.

USG: - Mild hepatomegaly and fatty changes, bulky uterus with small intramural fibroids which is fundal – 19 x 18 mm. Ovary cyst (Right ovary) 48 x 10 mm.

Treatment given:

1. Nimbāmṛtādi pañcatiktam kvātham Tabs - 2 – 2
2. Dāḍimāṣṭakam - 5 g at noon before meals (to see if any fatty changes will be corrected!)
3. Gandharvahastādi eraṇḍatailam 5 ml at bedtime.

28.02.08 - USG:- Retroverted just bulky uterus; Endometrial core 6 mm; No focal lesion; both ovaries normal in size with few tiny follicles.

Case No.5 (S)

22 years; one live child of 2 ½ years; reported with irregular periods with scanty flow. Thyroid 3 - 132; Thyroid 4 - 10.40; Thyroid stimulating hormone (TSH) - 3.01. Uterus Retroverted, 6.2 x 5.2 x 3.8 cm; normal size and texture; Endometrial core normal; shows hypoechoic round; mass of size 1.6 cm in the cervical region posteriorly ? Fibroid. Ovaries normal. POD clear. Periods - 23/02/07, 24/03/07, 27/04/07 and 26/05/07, which shows they are not irregular. Haemoglobin on 20/03/07 - 10.4 gm%;

Treatment given:

27.03.07 - Lohāsavam and Drākṣāriṣṭam
14.03.07 - Nimbāmṛtādi pañcatiktam kvātham tabs - 2 – 2
- Dhānvantaram (101) - 10 drops morning
- Gandharvahastādi eraṇḍatailam - 5 ml at bedtime.

07.07.07 - USG: Normal study. Retroverted normal size uterus. No mass. Adnexa normal

Case No. 6 (H)
Aged 52 years; reported on 27.07.07 with complaints of irregular periods.

USG:- Uterus anteverted, bulky, 8.8 x 4.6 x 5.6 cm. Well defined hypo echoic space occupying lesions noted in the posterior wall and anterior wall of the uterus measuring 1.9 x 1.6 cm 1.6 x 1.1 cm.

Treatment given:
1. Nimbāmṛtādi pañcatiktam kvātham tabs - 2 – 2
2. Sahadevi caps - 1g twice daily.
3. Gandharvahastādi eraṇḍatailam 5 ml at bedtime.

07.04.08. - USG:- Uterus 7.2 x 4.0 x 3.6 cm; anterior fundal subserous fibroid measures 11 mm. Fundal posterior myometrial fibroid measures 17 mm. Small seedling fibroids are seen in posterior myometrium. Endometrium measures 9 mm (2 layers). Inf. Fibroid uterus.

Patient attained menopause in March 2008.

Case No. 7 (R)
Married; aged 31; 2 children of 9 and 3 years old (both Caesarian section). Menorrhagia 4 years irregular heavy periods. Last menstrual period 08/03/08

26.03.08 - USG:- Uterus 8.6 x 6.0 x 4.6 cm; bulky endometrial thickness 3 mm. No myometrial mass lesions. Lower part of the body of uterus shows an exophytic round mass of size 3.1 x 2.2 cm posteriorly. Cervix normal; ovaries and adnexa normal. No free fluid in POD. Subserosal fibroid. Bleeding time 1 mt. 40 sec.; clotting time 3 mt. 50 sec.; Hb 11.2 gm%;.; Platelets 2.88

Treatment given:
1. Nimbamrtadi pancatiktam kvatham Tabs - 2 – 2
2. Dhanvantaram (101) - 10 drops in the morning.
3. Gandharvahastadi erandatailam - 5 ml at bedtime.

15.06.08 - USG:- Bulky uterus; Endometrial hypoplasia; Uterus - 12.7x4.4x6.0mm; Endometrial thickness 13 mm; No growth.

Case No. 8 (SR)
Married; aged 33; 2 children of 13 and 12 years (Post partum sterilization not done); reported on 05.02.07 with complaints of scanty periods.

USG:- Bulky intramural fibroid of size 28.2 x 25.9 mm on anterior body of uterus.

Treatment given:
1. Nimbāmṛtādi pañcatiktam kvātham - 2 – 2
2. Dhānvantaram gulika - 1 each twice daily,
3. Gandharvahastādi eraṇḍatailam - 5 ml at bedtime.

June 2007 - Scanty periods have changed to normal periods. USG not repeated since the patient is still on medicines.

Conclusion
Three years back, a patient of about 56 years from Haripad reported with irregular bleeding per vagina, who was advised hysterectomy, because fibroids were detected. She requested to prescribe

some āyurvedic medicines, since she was not in a position to undergo surgery at that time. She was given Nimbāmṛtādi pañcatiktam kaṣāyam, Gandharvahastādi eraṇḍatailam and Sahadevi capsules. After 6 months she reported. USG showed no fibroids. This result was very promising and encouraging to conduct a study.

After one year of study, the conclusion is that fibroid uterus of up to a moderate size, treated with Nimbāmṛtādi pañcatiktam kaṣāyam, Sahadevi capsules or pūvānkurutila fresh paste and Gandharvahastādi eraṇḍatailam for at least 3 months will give good results in the form of decreasing the complaints if not complete eradication of fibroid. In no case USG was repeated after a period of cessation of medicines to study reappearance of fibroids. In very small fibroids Sonologist suggests transvaginal USG to fully assess the size of fibroid.

- Pāvānkuruntila [sahadevi (Sanskrit) *Vernonia cinerea* (Latin)] is reported that it possesses anticancerous activities and is good for cancerous malformations.
- Nimbāmṛtādi pañcatiktam kaṣāyam / kvātham tablets is useful in leprosy, ulcers, tumours, fistula, swelling and colic.
- Gandharvahastādi eraṇḍatailam is very effective in pacifying vata perturbations and is a very good laxative.
- Dhānvantaram (101) is very effective in all types of vaginal disorders and vāta vitiation.

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EFFICACY OF ŚODHITAMALLA IN ĀMAVĀTA

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Abstract: Āmavāta is considered as one among the most crippling disorders of mankind. It is caused by improper functioning of gastrointestinal system due to various etiological factors characterized by affliction of the joints by vitiated kapha (in other terms āmarasa) bringing the immunological component to the forefront. The major feature of āmavāta is pain, which, āyurveda attributes to the involvement of vāta. There are various formulations mentioned in āyurvedic classics to break the samprāpti. Śodditamalla in combination with śuṇṭhi and punarnava is referred to in Rasataraṅgiṇi for the treatment of āmavāta.

Introduction

Āmavāta vis-à-vis Rheumatoid Arthritis has been described as one of the most crippling disorders of mankind. Āyurveda believes that virudhāhāra (unwholesome food habits), mandāgni (low digestive fire), niścalatva (stagnation of vāta) and excessive physical activity after intake of snigdhāhāra (unctuous food) result in āma developed by rasavāha-śroto-duṣṭi and in association with vāta exhibit the greater affinity towards the joints. The salient feature observed in this disease is jaṭharāgnimāndya as a primary source of āma in koṣṭha as well as at the level of dhātus due to dhātvāgnimāndya. Researchers are of the view that the disease is of an immunological origin. It is a chronic, systemic and inflammatory disorder affecting many tissues, organs, skin, blood vessels, heart, lungs and muscles; it principally attacks joints producing a non suppurative, proliferative synovitis that often progress to the destruction of articular cartilage and ankylosis of joints. Āmavāta (RA) is a common clinical entity affecting nearly between 0.4 - 1.7% of world's population. Females are more affected with the disease than males. Mādhavanidhāna describes āmavāta in detail in .

Āyurveda describes the principles of treatment of āmavāta based on langhana (reducing therapy), dīpana (digestive) and pācana (carminative) of apakva-āma-rasa followed by suppression of vitiated vāta and by rasāyana therapy in long standing cases. Recently a number of clinical and experimental studies have proved the efficacy of āyurvedic treatment. Observations demonstrate the impaired capability of digestion due to diminished gastric acid secretion, deranged liver functioning and

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impaired intestinal absorption in āmavāta. Further, the treatment with drugs having G.I stimulant effect has been shown effectual (Kishore & Tripati 1960). Modern treatment of āmavāta is not very satisfactory and often associated with serious side effects, whereas āyurvedic treatment is considered safe and effective. However, the treatment measures need standardization through clinical trial to evaluate the clinical efficacy. This trial was conducted from this point, with śodhitamalla, śuṇṭhi and punarnava based on reference from Rasa-taraṅgiṇi.

Material and methods

30 patients, having classical symptoms of āmavāta and criteria for Rheumatoid Arthritis given by American Rheumatism Association (1988), were selected from the OPD and IPD of Taranath Govt. Ayurvedic Medical College, Bellary, irrespective of sex, religion, occupation, income and social status.

Inclusion criteria

- Patients with classical symptoms,
- Aged between 15-55 years of either sex
- Chronicity of disease (less than 5 years)
- Morning stiffness
- Arthritis of 3 or more joints
- Symmetrical arthritis
- Rheumatoid nodules

Exclusion criteria

- Patients with gout
- Osteoarthritis
- Psoriatic arthritis
- Osteomyelitis
- Rheumatic fever
- Chronicity more than 5 years
- Age below 12 and above 60 yrs
- Any concomitant serious disorder of the liver, heart, lungs, any other organ.

Assessment criteria

All the trial patients were subjected to routine screening procedure of history of illness, family history, and physical examination and then advised to receive the treatment for 30 days.

Clinical parameters:

1. Morning stiffness (stabdhata)
2. Pain over joint (sandhi śūla)
3. Swelling of joint (sandhi śotha)
4. Muscle power
5. Grip power
6. Restricted movements.

Laboratory parameters:

1. ESR
2. R.A factor, CRP, ASLO
3. Radiological test
4. Complete blood picture

The assessment was done before the drug administration, after 10 days, at the 20th day and at the end of the month. The interpretation of results was done under following categories:

If over-all improvement is -

- > 75% Good response
- > 50% Fair response
- > 25% Poor response
- < 25% No response

Improvements of hematological, serological and radiological investigations were also considered.

Preparation of trial drug

Kāravellaka-śodhitamalla in the dose of 4 mg mixed with 125 mg of ārdraka-svarasa-bhāvita śuṇṭhi-cūrṇa and 125 mg of punarnavacūrṇa were grinded in mortar and pestle till the homogenous forms and filled into 250 mg capsules; this was prescribed with the anupāna of milk - b.i.d for 30 days.

Observations and results

In the present study, 30 patients aged between 15-55 years were selected from OPD/IPD of college hospital to evaluate the efficacy of herbomineral combination on āmavāta. The observations made during trial period were as follows:

Majority of the patients were between 35- 45 years of age group (53%) and was observed in chronicity of 5 years (35%), 4 years (10%), 3 years (18%), 2 years (22%) and 1 year (15%) respectively. Females outnumbered the males (36.66%).

Analysis on prakṛti-wise distribution shown that majority of āmavāta patients belonged to kapha-vāta prakṛti (53.34%). The observations done on clinical parameters in patients suffering with āmavāta showed that there was 77.8 % improvement in joint pain, 64% in swelling, 60% in morning stiffness, 68% in tenderness and 60.4% by muscle power. The over all improvement in clinical parameters was statistically significant. Besides, patients expressed statistically good relief in pain clinically. Study significant fall in their ESR levels and Positive RA Test turns negative in 25 cases (84%).

The clinical study with śodhitamalla, śuṇṭhi and punarnava showed good response in 19 cases (63.4%), fair response in 8 cases (26.6%) and poor response in 3 cases (10%).

Discussion

In āyurveda, the main factor involved in aetiopathogenesis of amavata is mandāgni (low digestive fire). The identified causes for the development of āmavāta are intake of guru and snigdha āhāra (heavy and oily food), sedentary life style, virudhāhārasevana (unwholesome food habit) after vyāyāma (exercise), etc. These factors leads to the formation of āmarasa, and thus formed āmarasa circulates all over the body due to the simultaneous aggravation of vāta and settles at various kaphasthānas like stomach, heart, joints, etc. gives rise to kḷedha (moistening) and avarodha (obstruction) in annavāhaśrotas (alimentary canal) due to atipicillaguṇa (over sliminess).

Probable mode of action of the drug: - The trial drug combination consists of śodhitamalla, śuṇṭhi and punarnava. Śuṇṭhi with its digestive and carminative properties, and punarnava with its anti-inflammatory property relieve inflammation and provide nirāma. Malla with its tiktarasa (bitter taste), rūṣaguṇa (rough quality) and uṣṇavīrya (hot potency) relieves vātadoṣa and at the same time provides rasāyana effects.

Conclusion

On the basis of clinical trial and observations made, it may be concluded that the formation of āma is a major contributing factor in initiating the disease pathogenicity. The trial drug showed significant response over the randomly selected patients. The results may be attributed to its rasāyans and anti inflammatory property. Hence śodhitamalla along with śuṇṭhi and punarnava in ideal combination is effective in acute conditions of āmavāta as an anti inflammatory drug.

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EFFECT OF RASĀYANA DRUGS IN POSTMENOPAUSAL SYNDROME - A CLINICAL STUDY

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Abstract: Postmenopausal syndrome is a common condition seen in women during the post-menopausal phase. According to āyurveda, rajokṣaya (cessation of menstruation) takes place after the age of 50 and postmenopausal syndrome (PMS) can be correlated with Rajonivṛttilakṣaṇa. Modern medical science is having solutions for PMS, with its own risk of development of carcinoma endometrium by means of hormone replacement therapy. Rasāyana therapy is meant to get praśastadhātus, hence rasāyana is the best therapy in this condition.

Introduction

Rajonivṛttilakṣaṇa (postmenopausal syndrome), one of the most important Gynec problems, is a common condition seen in women during their postmenopausal phase due to early aged hysterectomies (surgical menopause) and also due to increased life expectancy, especially in affluent society. About one third of life span will be spent during the period of estrogen deprivation stage with long-term symptomatic and metabolic complications.

The period in which the cycles cease and the female sex-hormones diminish is called menopause. The loss of the estrogens causes marked physiological changes in the function of the body including hot flushes characterized by flushing of the skin, night sweats, psychic sensations of dyspnoea, irritability, fatigue, anxiety, insomnia, occasional psychotic states, decreased strength and calcification of bones, muscle/ joint pain and cardiovascular diseases.

Postmenopausal syndrome is not described in āyurveda as such, but Suśruta describes menopause as rajokṣaya; the Rajonivṛttilakṣaṇa is due to rajodhātukṣaya. Hormone replacement therapy is the established treatment for this condition but the recent report from the women's health initiative study, which is the first large scale randomized controlled trial in women aged 50-79, showed a positive finding that the risk of breast cancer beginning to decline when HRT is stopped and the risk after five years is at the same level as in any other women who have not taken HRT. It (HRT) seems to be associated with an increased risk of breast cancer, myocardial infarction, cerebrovascular and thromboembolic diseases.

In āyurveda, rasāyana therapy is indicated for jarakalīnavyādhis (old age diseases) and it also gives praśastadhātus (nourishment to tissues); hence, to improve the status of rajodhātu, rasāyana therapy is adopted in the present

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study. Vidāri (*Pueraria tuberose*) and aśvagandha (*Withania somnifera*) are well known rasāyana drugs with balya (tonic) and bṛmhaṇa (nourishing) properties; hence Vidāryādi ghṛtam and Aśvagandhādi kaṣāyam were selected for the study.

Materials and methods

Data source:- Total 54 patients (between 40 to 60 years of age) having postmenopausal syndrome were selected from the OPD according to the selection criteria. Type of study was single/open trial, and the duration was 3 months.

Drug: - 1) Vidāryādi ghṛtam (10g) and 2) Aśvagandhādi kaṣāyam (20 ml) - twice in a day along with the milk.

Inclusion criteria

- Age between 40 - 60 years.
- Cessation of menstruation for consecutive 12 months during climacteric.
- Surgical menopausal cases.
- Appearance of postmenopausal symptoms with above two conditions.

Exclusion criteria

- Age below 40 and above 60 years.
- Organic lesions like carcinoma, fibroids of the reproductive system.
- Any severe systemic illness.
- Established cases of mental illness.
- Unexplained postmenopausal bleeding per vagina.

Assessment criteria

Clinical assessment was done according to the criteria (Table 1) before the drug administration and at the end of 1st, 2nd and 3rd month. Statistical analysis was done applying the student't' test.

Observation and result

Out of 54 cases, 14 cases got good response, 20 cases got fair response, poor response seen in 09 cases and 05 cases did not get any response (Table 2). Six cases were dropped out from the

TABLE 1

Symptoms/signs	Gradation
1. Hot flushes	
Severe - Regular attacks	30
Mod. - Frequent attacks	15
Mild - Occasional attacks	07
2. Night sweating	
Severe - Profuse during hot flushes	20
Mod. - Moderate during hot flushes	10
Mild - Occasional night sweats	05
3. Insomnia	
Severe - Complete lack of sleep	10
Mod. - Disturbed sleep most times	05
Mild - Occasional sleep disturbance	02
4. Dryness / itching in vagina	
Severe - Continuous burning/itching	10
Mod. - On and off burning/itching	05
Mild - Occasional burning/itching	02
5. Anxiety	
Severe - Always anxious	10
Mod. - Frequent episodes of anxiety	05
Mild - Occasional episodes of anxiety	02
6. Mood fluctuation/irritability	
Severe - Always depressed/irritated without any reason	10
Mod. - Frequent episodes of depression /irritation	05
Mild - Occasional episodes of depression /irritation	02
7. Stress incontinence	
Severe - Incontinence of urine even during sleep	10
Mod. - Incontinence of urine on raise of intra abdominal pressure	05
Mild - Incontinence on acute raise of intra abdominal pressure	02

Responses: a) Good - 76-100% relief (from presenting sign and symptoms), b) Fair - 51-75% relief, c) Poor - 26-50% and d) No response: below 25% relief or no relief at all

study. More number of cases seen from the age groups of 46-50 and 50-56 (Table 3). Before treatment, 47 patients were having severe to moderate hot flushes and after treatment, it was 34; severe to moderate dryness in the vagina observed in 26 cases and after treatment 21 patients got complete relief (Table 4). Marked relief seen in insomnia also, 46 (95.83%) patients were suffering from it in severe to moderate grade before treatment; and after treatment 34 (70.84%) patients got relief from it. On statistical analysis the efficacy of this combination of drugs found highly significant (P <0.001) (Table 5).

Discussion

Aśvagandha is a popular rasāyana drug indicated for dhātuvṛdhi in Rājayakṣma prakaraṇa in Cakradatta. Vidārikanda is also well known rasāyana drug for geriatrics described by Suśruta and Vāgbhata. On pharmacological screening, total alkaloids of aśvagandha produced a mild depressant effect (tranquilizer - sedative type) on the central nervous system in several experimental animals. These alkaloids also showed relaxant and antispasmodic effects against several spasmogens on intestinal, uterine, bronchial, tracheal and blood vascular muscles.

'Withaferin-A' is the most important withanolide isolated from aśvagandha. It has been receiving good deal of attention because of its antibiotic and anti-tumor activities. Specific chemical systems of Withaferin-A possessing carcino-

TABLE 2
Results of the study

Sl. No.	Response	No. of cases	%
1	Good	14	29.16
2	Fair	20	41.67
3	Poor	09	18.75
4	No	05	10.42
Total		48	100.00

TABLE 3
Incidence of age, type and duration of menopause

Description	No. of cases	%
1. Incidence of age		
Age group:		
- 40-45	08	14.83
- 45-50	17	31.48
- 50-55	16	29.62
- 55-60	13	24.07
Total	54	100.00
2. Type of menopause:		
- Natural	42	77.77
- Surgical	12	22.33
3. Duration of menopause:		
- 12-24 months	25	46.29
- 24-36 months	29	53.71

TABLE 4
Status of symptoms before & after the treatment

Status	BT*		AT*	
	No	%	No	%
A. Hot flushes:				
- Severe	22	45.83	02	04.16
- Moderate	25	52.08	12	25.00
- Mild	01	02.09	22	45.84
- No	00	00.00	12	25.00
Total	48	100.00	48	100.00
B. Dryness of vagina				
- Severe	03	06.25	00	00.00
- Moderate	23	47.92	05	10.42
- Mild	15	31.25	25	52.08
- No	07	14.58	18	37.50
Total	48	100.00	48	100.00

* BT - Before treatment; AT - After treatment

TABLE 5
Statistical analysis of the overall parameters

Sl.No.	Description	BT	AT	Difference
1.	Mean-grade Score	49.60	20.54	29.02
2.	S.D.	±17.26	±12.39	±15.26
3.	S.E	1.579	1.79	2.20
4.	't'			13.175
5.	p			<0.001

static property, acted as a mitotic poison arresting the division of cultured human-larynx carcinoma cells at metaphase and in Hela cultures similar to star-metaphase. It also produced significant retardation of growth of ehrlich ascites carcinoma, sarcoma 180, sarcoma black and E0771 mammary adenocarcinoma in mice in the doses of 10, 12, 15 mg/kg body weight. Withaferin-A also exhibits fairly potent anti-arthritic and anti-inflammatory activities, seems to be more potent than hydrocortisone adjuvant-induced arthritis in rats, without any side effects. It is rich in crude protein, calcium and phosphorus and number of free amino acids.

Aśvagandha's sedative and smooth muscle relaxing properties might have helped in relieving vasomotor complaints like hot flushes, insomnia and anxiety, irritability, depression. Antiboitic and anti-inflammatory actions of it prevent the atrophic vaginitis and dysurea. The drug is a well-known aphrodisiac; hence it may help in loss of libido of post menopausal period. Vidārikanda (*Pueraria tuberosa*) is rich in phytoestrogens, which are safe and gives complete relief in postmenopausal symptoms. It is rich in calcium and protein.

Synergistic neutracutical action of aśvagandha and vidārikanda might have restored the calcium balance and thereby further bone loss is prevented. No unwanted side effects observed during the course of the study, like nausea, vomiting, post menopausal bleeding, etc.

Conclusions

- Postmenopausal syndrome can be correlated with rajonivṛtilakṣana in āyurveda.
- Aśvagandha and vidārikanda are complementary to each other in treating postmenopausal syndrome.
- The sedative, antispasmodic, antibiotic, anti-inflammatory properties of aśvagandha help in relieving the PMP symptoms.
- Withaferin-A is the most important of withanolides, to which the curative properties of aśvagandha are attributed.
- Vidārikanda is rich in phytoestrogens and gives relief from PMS in a natural way.
- Aśvagandha and vidārikanda in synergy restored the calcium balance and prevented further bole loss.
- On statistical analysis the efficacy of this combination of drugs in relieving PM symptoms, found highly significant ($P < 0.001$).

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EUTOCIA (SUKHAPRASAV) THROUGH PSYCHO-PROPHYLAXIS - AN ĀYURVEDIC APPROACH

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Abstract: We cannot imagine labour without pain; and pain definitely is not pleasurable. Today, psycho-prophylaxis has become a prominent part of treatment for various diseases. Process of labour is also not untouched with it. Today, physicians are trying to lessen the pain through various types of analgesia and anesthesia. Psycho-prophylaxis through counseling and assurance play a very important role in labour/painless labour. To get a healthy baby and for an easy and comfortable delivery, āyurveda describes sukhaprasav, etc. i.e. ṛtumatīcarya (regimen for conception), māsānumāsik-garbhiṇī-paricarya (monthly regimen for nursing the pregnant woman), care in sūtikāgar (labour room) and so on.

Introduction

In the developed countries, pregnant women are educated about pregnancy, process of labour and her conduct during delivery to cope up with fear of labour pain. Counseling and assurance play an important role in this regard. A pregnant woman is assured that her active co-operation will make the labour easy and less painful. Approach of āyurveda towards management and treatment for an easy comfortable delivery starts before conception.

Before conception

The great trios of āyurveda (bṛhatrayī) suggest that male and female become fully matured at the age of 25 and 16 respectively and that this is the appropriate period for achievement of conception to get a healthy baby through a comfortable delivery[1].

Āyurvedic classics explain 'conception' as a ritual[2]. Ṛtumatīcarya (regimen for conception) has been described very beautifully in āyurveda. Act of coitus is not meant for pleasure alone but is for a noble cause i.e. couples who are willing for progeny should indulge in this act with pious thoughts. Unwanted or unplanned pregnancies may result in depression or other complications which will definitely not lead to an easy and comfortable delivery. Āyurveda tells that coitus should not be done with a woman who is hungry or over-eaten, thirsty, frightened, sorrow-stricken, angry, loving someone else, having absence or excessive desire for sex, fatty, chronically ill especially suffering from gyneco-logical disorder, menstruating, pregnant, emaciated or weak, dirty, unloving, girl of less age, elderly woman coming from higher caste, jealous,

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belonging to one's own gotra (sub-caste) wife of teacher and a female ascetic[3].

Antenatal care

Antenatal care is the most important aspect in the whole area of prasūtitantra. This is so because all the other aspects depend on this phase including health of mother and child and her ability to withstand the strain of labour easily and comfortably. Āyurveda refers to sadyograhita garbha i.e. diagnosis of pregnancy, and describes the proceedings for painless management of labour from that very day[4].

Ācaryas describe diet, safe medication and some special therapies month-wise called māsānumāsika paricarya. By this, minor ailments can be prevented, the fetus attains growth, vāyu moves in right direction, the woman became unctuous, strong and delivers the child without complication[5]. Special therapies like vasti (oil or medicated enema) and picu normalize the apānavāyu. Better function of apānavāyu cause good and coordinated myometrial contraction associated with good cervical dilatation, which results in short duration of labour. As scheduled time is shortened, woman in labour bear less pain and exertion. Normalization of apānavāyu increases the pain-threshold; increased pain-threshold help in better co-operation of the woman, and thereby good bearing down efforts and also less feeling of after-pain. Vasti and picu may be acting by influencing the autonomic nervous system, however, influence of prostaglandin cannot be ruled out. Āyurveda advises pregnant woman to wear a chain of tṛvṛt (a plant) in pelvic region, for it helps in 'sukhaprasav' by its 'prabhāva'[6]. It may give feeling of safety and psychological strength. Āyurveda advocates pregnant woman to wear clean clothes as well as clean her surroundings to prevent infectious diseases[7]; to worship, remain joyous and listening saints[8]. 'Sīmāntonayanasanskār' is described during the 5th month to inform near and dear about her pregnancy, and get moral support and a caring environment. All these help to improve threshold of pain bearing capacity.

Pregnant woman should do yoga and simple exercise like walking, tadāsan, uttanpadāsan, sukhāsan to improve the circulation and for relaxation of pelvic muscle, so labour is less painful. All steps of prāṇāyama except kapalbhati should be done as this breathing exercise improves circulation, oxygenation and placental perfusion. Practice of prāṇāyāma also helps at the time of bearing down efforts and increases pain threshold.

Sūtikāgar:- The woman is being kept in sutikāgar from the ninth month onwards. This is mainly to prevent the contact of infections and prepare the woman psychologically to withstand labour pains. Rakṣoghna (antiseptic) drugs and other important material needed for delivery should be kept in sūtikāgara so that pregnant woman remains mentally sound and relaxed.

To make labour more comfortable, encouragement and assurance are given to boost up the moral and to avail maximum co-operation during voluntary expulsion of the fetus. Good-natured, affectionate and enduring ladies, surround the expectant mother should encourage her so that she gets psychological support and deliveries normally. The labour ward should be full of gifts, auspicious recitation, blessings, praises, playing musical instruments, clean and dainty food and drinks along with loyally devoted and delighted

persons. For the good fortune and welfare of the mother and the child, the brhāman possessing knowledge of Atharvaveda should perform 'śānti ōm' (pacifying oblation to avert or remove evils) at morning and evening times[9]. Sympathetic, loving, encouraging behaviour of care takers, homely atmosphere are best analgesic.

Labour: Āsanna prasava or upasthita prasava advised to do auspicious deeds to divert her attention from pain. Gentle massage with lukewarm oil on parśvapṛṣtha, kaṭi, śaktipradeśa (back, loin and thighs) is advised to prevent vātaprakopa to lessen the pain. Repeated yawning (to improve oxygenation) and walking for a while are advised[10]. Satvāvajaya, continuous presence, assurance, counseling about normal labour by care takers leads to sukhaprasava (diversion of mind from pain), same role played by psychoprophylaxis.

During parivartan or avāk of garbha (expulsive phase of labour) āvi (labour pains) becomes intensive and progressive. Care takers should assure her about normalcy of labour and during contraction of uterus, they should repeatedly say sentences like "delivered.....delivered; well-done.....well-done.....; male child born....., male child born....."[11]. By this, woman gets more enthusiastic, encouraged and get strength to bear down.

Care taker should advise her not to bear down in absence of āvi, because it would be useless, bear down slowly in expulsive phase i.e. fetus release bond of hṛdaya and descent towards pelvis (lightening). During propulsive phase, where fetus about to deliver, bearing down efforts should be very strong[12].

One of the care-takers should speak mantras (hymns) in parturient ear[13]. This procedure help and get rid of fear (fear may be of unknown cause, fear of delivering dead fetus or congenitally malformed baby and above all fear of pain obviously), and change the mode of thinking and divert the mind. 'Ubhaytriśank mantra' used in delayed progress of labour, helps psychologically[14].

Conclusion

Āyurveda suggests three modes of treatment yuktivyāpaśraya, daivavyāpaśrya and satvāvjaya. Satvāvjayacikitsa as well as daivyāpāśrayacikitsa in some or other way is psychoprophylaxis. Assurance and proper counseling throughout in antenatal and perinatal period give pregnant woman mental and physical strength to give birth a healthy child in safe and comfortable way without bearing much pain.

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DETERMINATION OF HEAVY METALS IN VĀŚAKA LEAVES

Aswatha Ram H.N, Annie Shirwaikar and Arun Shirwaikar*

Abstract: *Adhatoda vasica*, commonly known as adusoge, is widely used for its bronchodilatory, anti-asthmatic and oxytocic properties. As the source of vāśaka cannot always be ensured from the same geographical location, there may be variations in the standards prescribed by World Health Organization. In the present investigation, an attempt is made to determine the heavy metal content in vāśaka leaves collected from two different places in Karnataka.

Introduction

Metals having specific gravity >3.5 are considered to be heavy metals, except iron; e.g. lead, cadmium, copper, arsenic, etc. Contamination of medicinal plant materials with heavy metals can be attributed to many causes such as environmental pollution and use of of pesticides. Lead occurs naturally in the earth's crust. Lead can also be found in herbs, health food and cosmetics like eye liners[1&2]. When ingested, inhaled or absorbed through the skin, it is highly injurious and causes plumbism. Heavy metals cause gastrointestinal disturbances, liver damage, and bone and nervous system defects[3-5]. WHO prescribe limits for these heavy metals found in medicinal raw materials. We have made an attempt to determine the presence of heavy metals in vāśaka leaves collected from two different places in Karnataka.

Materials and methods

The vāśaka procured from Manipal and Bangalore were shade dried and subjected to heavy metal determination as per WHO protocol[6]. All other chemicals and reagents used were of analytical grade.

Lead and cadmium

Digestion vessel: Vitreous silica crucible, tall form, height: 62mm, diameter: 50mm, content: 75ml, with vitreous silica crucible cover.

Digestion mixture: 2 parts by weight of Nitric acid (~1000g/l) and 1 part by weight of Perchloric acid (~1170g/l) TS.

Preparation of the sample: The sample was prepared by wet digestion method in an open system. Accurately weighed 200-250mg of air-dried plant material finely cut and homogeneously mixed into a cleaned silica crucible. Added with 1 ml of digestion mixture, covered

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the crucible without exerting pressure, and placed it in an oven with controlled temperature and time regulator. Heated slowly to 100°C and maintained at this temperature for three hours. 120°C for two hour, slowly raised the temperature to 240°C for four hours. The remaining dry inorganic residue was used for the heavy metals determination. Dissolved the residue in 2.5ml of Nitric acid (~1000g/l) TS. The sample was subjected to Atomic Absorption Spectrophotometry (GBC 932 PLUS, Australia) for the determination of heavy metals.

Procedure: The calibration curve was obtained in the same way as for spectrophotometric assays, viz. by setting the instrument to zero and infinite absorbance and reading the absorbance for standard solutions directly, and measured the absorbance for sample solutions also.

Arsenic

Preparation of the aample: The sample was prepared by acid digestion method. Fifty grams of coarsely ground material was placed in a 1000ml kjeldahl flask. Flask was added with 10-25ml of water, and 25-50 ml Nitric acid (~1000g/l) TS and then carefully 20 ml of sulfuric (~1760g/l). Heated cautiously and gradually added Nitric acid drop-by-drop until all the organic matter was destroyed. Cooled, added with 75ml water and 25ml of ammonium oxalate (25g/l). Heating was continued until sulfur trioxide vapors developed. Cooled and transferred with the help of water to a 250ml volumetric flask and diluted to volume with water.

Procedure: Test solution (25-50 ml) was placed in the wide mouthed bottle containing 10 grams of granulated zinc and 1 gram of potassium iodide. Stoppered the bottle and quickly placed the previously set up of glass tube connected with two rubber bungs placed with mercuric chloride paper in between. Reaction was allowed to take place at slightly raised temperature. Arsine gas stained the mercuric chloride paper to yellow; expressed the content of arsenic per gram of the plant material.

Results and discussion

Worldwide, the major sources of lead exposure include home paint, airborne emissions from incinerators and industries, water (old lead pipes, plumbing fittings) and heavy industrial pollutants. The presence of heavy metals such as Cadmium (0.3ppm) and Lead (10ppm) are allowed in the plant drug material. Atomic Absorption Spectrophotometer uses the flame, into which the solution is sprayed, as if it were a cell containing an absorbing solution, the light source being a hollow cathode lamp of the element being determined. The intensity of a selected emission line is measured before and during the spraying of the solution, in the flame to give extinction as in spectrophotometry. The leaves collected from Manipal contained lead 476 ppm and cadmium 16 ppm which exceeded the limits prescribed. While the sample procured from Bangalore had lead and cadmium within limits i.e. 2.021 and 0.0255 ppm respectively.

Arsenic was determined in the plant sample after the acid digestion using Arsenic apparatus. The acid present in the test solution and granulated zinc react, producing nascent hydrogen. The hydrogen reacts with arsenious acid present in the TS forming arsine gas. Arsine gas will stain the mercuric chloride paper to yellow. Potassium iodide and stannous chloride help in maintaining reducing conditions so that arsenic in arsenious form is available. An estimate of the amount of arsenic in the materials is made by matching the

depth of color of a series of standard stains. A stain produced with 1ml of standard stain solution (dilute As = 10ì g of As/ml) compared with a stain produced using 10 g of the material indicates the presence of 1ì g of as per gram of the plant material. Arsenic was found to be within limits (<1ì g) in both samples collected from two places.

Conclusion

From the above findings, it can be concluded that the sample collected from Bangalore passes the heavy metal test and can be used in the preparation of formulations. Whereas, the other sample was rejected as it contained more heavy metals.

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EFFICACY OF VAMANA IN THE MANAGEMENT OF KIṬIBHA (PSORIASIS)

Rai P.K.[1], Singh O.P.[1], Rai N.P.[1] and Singh S.K.[2]

Abstract: Kiṭibha (psoriasis) is one of the most common dermatological problems of unknown etiology. In modern medicine there is no definite treatment for this disease. The medicines which are available to treat the disease are not very effective and cannot be used for long term management because of their local and systemic side effect as well as toxicity. Vamanakarma (emesis) is one of the processes of pañcakarma described in āyurvedic classics for the treatment of kaphaja disorder. Kiṭibha is said to be a vāta-kaphaja disorder and vamanakarma is prescribed for their treatment.

Introduction

Psoriasis (kiṭibha) is a chronic, genetically determined, inflammatory and proliferative disease characterized by dry, well-circumscribed, silvery scaling papules and plaques of various sizes with spontaneous remission, relapse and seasonal variation, lesions distributed all over the body, covering loops of dilated superficial capillaries underneath which are presented as tiny bleeding points on removal of scales (Auspitz's sign). It affects about 2% of world population. Various races and communities differ in the susceptibility to this disease. In India it affects about 1.5% of population. It appears to be common in Europeans than in Orientals. Psoriasis like other skin disorders is a challenge to the medical science. In modern medicine there is no definite treatment for this disease. The medicines, which are available to treat the disease, are not very effective and cannot be used for longterm management because of their local and systemic side effect as well as toxicity.

Materials and method

Selection of patients: - A series of 18 cases of uncomplicated psoriasis patients who visited O.P.D. and I.P.D. of Kāyacikitsa the S.S. Hospital, Banaras Hindu University, Varanasi were selected for the present study during the period of August 2005 to December 2007.

Inclusion criteria: - Patients from 12 to 70 years having clinical signs, symptoms suggestive of psoriasis (kiṭibha).

Exclusion criteria: - Patients less than 12 and more than 70 years of age, having inconclusive diagnosis, psoriatic arthropathy and psoriatic erythroderma, cardiac disease, renal disease and endocrine disorders were excluded in the study to avoid overlapping of symptoms.

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Vamanakarma

The patients were given Pañcatiktaghṛta in the dose of 30, 60, 90, 120, 150, 180, 210ml per-oral from day 1 to day 7 respectively. Once the proper snigdhalakṣaṇas, i.e. passage of ghee in the stool, the feeling of greasy (oily) skin and fatigue are attained, the oleation is stopped. Then sarvāṅgasvedana (medicated steam bath) is given along with external application of Tuvaraka taila for two days i.e. day 8 and day 9. Kaphavardhaka diet in the form of sweets, oily rich foods, milk, curd (meat in the case of non-vegetarians) is advised during the above two days. Then on the 9th day vamana process is started in the kaphajakāla i.e. at 9 am. A paste of the drugs mentioned below is given orally followed by ākaṇṭhakṣīrapāna (large quantities of milk).

Vamaka dravya:- i. Madanphala (*Catunaregum spinosa*) - 1 part (antarnakha muṣṭi pramāṇa - appx. 20gm), ii. yaṣṭimadhu (*Glycyrrhiza glabra*) ½ part, iii. vaca (*Acorus calamus*) ¼ part, iv. honey - quantity sufficient (appx. 50g), milk - 5 litre and v. saline water - 5 litre.

If the patient feels the urge to vomit, tickling of the soft palate is done with finger, and the contents are expelled out. Then saline water is given and the stomach emptied completely as above. Then Kadirādi vaṭi is given for chewing followed by dhūmrapāna* to pacify the aggravated kapha. The above process is terminated by advising the patient to follow samsarjanakarma according to features of proper emesis. The patient is advised to take liquid diet from evening and gradually increase the consistency (semisolid to solid) of diet up to normal diet.

*Dhūmravarti dravya :- Kaṇṭakāri cūrṇa (*Solanum surattense*), haridra cūrṇa (*Curcuma longa*), tila tailam (Sesame oil)

Diagnosis criteria

- Sharply defined erythemo-squamous lesions varying in size
- Presence of erythema, scaling and induration in the lesions
- Surface consists of non-coherent scales
- Positive Auspitz sign - (bleeding occurs after scratching of scales)
- Positive onion peeling sign/candle grease sign (after scratching the scales fall like peels of onion).

Scoring (PASI score)

The four main anatomical sites are assessed. The head (h), upper extremities (u), trunk (t) and lower extremities (I) roughly corresponding to 10, 20, 30 and 40% of body surface area (BSA), respectively. The PASI (Psoriasis Area Severity Index) score is calculated as follows: PASI = 0.1 $(E_h + S_h + I_h) A_h + 0.2 (E_u + S_u + I_u) A_u + 0.3 (E_t + S_t + I_t) A_t + 0.4 (E_L + S_L + I_L) A_L$; where E = Erythema, S=Scaling, I=Induration and A=Area; E, S and I are assessed according to a '4'point scale where:- 0=No symptoms, 1= Slight, 2 = Moderate, 3 = Marked and 4 = Very marked. 'A' is assigned a numerical value based on the extent of lesion in a given anatomic site: 1 (<10%), 2 (10-29%), 3 (30-49%), 4 (50-69%), 5 (70-89%) and 6 (90-100).

Scoring criteria for other symptoms:- Score 0 - No symptom; 1- Mild; 2 - Moderate; 3 - Severe.

Parameters of assessment

1. Estimation of PASI score; 2. Patients report as his own observations; 3. General assessment of the doctor (researcher); 4. Photographs taken at regular intervals and 5. Side / toxic effects of the drug, if any.

Observation and result

All statistical analysis is done by student-unpaired t-test. The 'p' value <0.001 were considered to be statistically highly significant. The 'p' value >0.05 were considered to be statistically non-significant (Table 1) (Fig. 1 a&b)

Discussion

Vamana is one of the important processes for purification of the body described in āyurveda. Researches show that it reduces the blood histamine (C.M. Tiwari, R.H. Singh 1990). Histamine is an inflammatory mediator. Thereby vamana reduces the inflammation. From the present study it has been observed that the reduction in scaling was found to be statistically highly significant in patient treated with vamana therapy (t=15.11, p<0.001). The reduction in erythema, induration, itching, burning sensation, discoloration, dryness of skin was also found to be statistically highly significant which is represented by paired t-test that is (t=19.62,

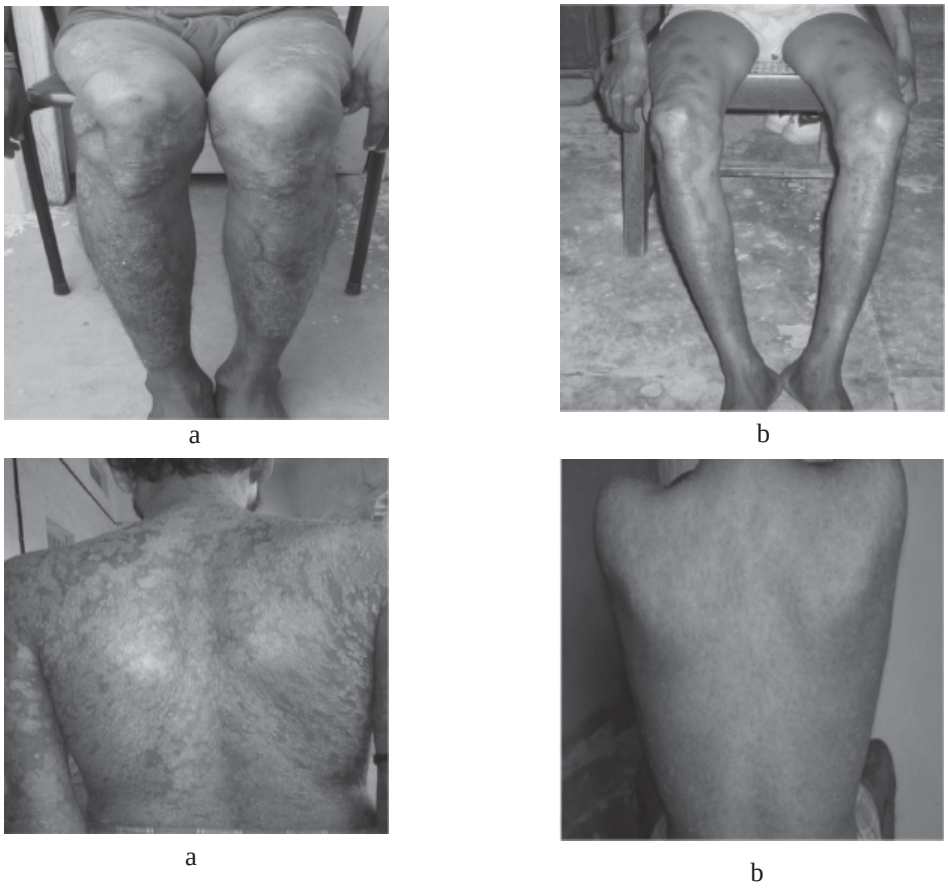

Fig 1a&b: **a**. Before treatment; **b**. After treatment

TABLE 1
Effect of vamana in (psoriasis) kitibha

Symptoms	Mean + SD		Paired t-test		
	BT	AT	BT - AT	't'	p
Erythema	3.50 ± 0.52	0.58 ± 0.51	2.92 ± 0.52	t_2=19.62	p<0.001
Scaling	3.58 ± 0.51	0.67 ± 0.49	2.92 ± 0.67	t_2=15.11	p<0.001
Induration	3.58 ± 0.51	0.75 ± 0.45	2.83 ± 0.58	t_2=17.00	p<0.001
Itching	1.75 ± 1.22	0.17 ± 0.39	1.58 ± 1.17	t_2=4.71	p<0.01
Burning sensation	1.33 ± 1.15	0.00 ± 0.00	1.33 ± 1.15	t_2=4.00	p<0.01
Discoloration	3.67 ± 0.49	0.58 ± 0.51	3.08 ± 0.52	t=20.74	p<0.001
Dryness of lesion	3.58 ± 0.51	0.52 ± 0.52	3.08 ± 0.29	t=3.7	p<0.001
PASI score	27.71 ± 9.71	19.97 ± 7.98	7.74 ± 2.28	t=11.74	p<0.001

p<0.001), (t=17.00, p<0.001), (t = 4.71, p<0.01), (t = 4.00, p<0.01), (t = 20.74, p<0.001) and (t = 37.00, p<0.001) respectively. PASI score is the main parameter of assessment in psoriasis. It has high inter-observer variability in calculation of area involved but still it has been used frequently to assess the improvement in psoriasis. The mean reduction in PASI score was also found statistically highly significant (t = 11.74, p<0.001).

Conclusion

From the above clinical study, it has been observed that the treatment samśodhana (vamana) therapy is statistically highly significant in reducing the symptoms of psoriasis.

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ENUMERATION OF ETIOPATHOGENESIS IN CLASSIFICATION OF DISEASES IN ĀYURVEDA

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Abstract: The basis of classification of diseases in āyurveda is a simple numerical differentiation which groups diseases into any single category by their common factor and separates them internally by the differentiating factor. The aetiopathogenic course is the foundation of classification of diseases in āyurveda. Samprāpti and its sāmkhya are the exclusive tools both to abstract and classify diseases and this system of classification is unique.

Introduction

The physician can categorise diseases in any plane according to his purpose[1]. This gives rise to innumerable kinds of categorization which often creates confusion. The classification becomes relative and not self explanatory, affecting the scientific communication negatively. The multiplicity of basis of classifications and variations in understanding of diseases in various systems of medicine makes it a highly complex problem. This gives rise to coining of new names for diseases in order to make parallel nomenclature in āyurveda unscientifically, such as arbuda for cancers, viṣūcika for cholera, āmavāta or vātarakta for rheumatoid arthritis etc. The original classification of 20 varieties of prameha has no practical utility as he has accepted the modern classification and adopted it with poor results.

International classification of diseases is a numbering system at an international level in which groups the diseases according to common characteristics and aims at better scientific communication. This can be useful in minimizing the variations existing in different countries in criteria and standards adopted for diagnosis of diseases and their notification.

The nature of samprāpti

The imbalance of dhāthus is momentary in character. Being defective by itself, it gives rise to another imbalance. Such sequential momentary imbalances, gives rise to a series of activities which forms the entity of disease. Thus the disease is an all comprising word where samprāpti discusses its pathogenic events. Samprāpti tracks down the evolution of illness without missing any details and by using every special tool for it. Both, causes and prodromal symptom are discussions on diseases about a stage before its completion of existence. Samprāpti is the biography of the disease. Visualizing the events in a manner that says -

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such vitiation, in such a location, accompanied by such and such factors, etc. in order to appreciate the disease as a whole is the procedure for it. Thus it explains the details of dosa vitiation and its spread in development of any disease. The samprāpti should be capable of explaining the types of causes, the degree of involvement of each property like dryness, lightness, gradation of the status of each doṣas and their mutual association. It should also clarify the track and direction of spread of doṣas and the emergence of illness. For instance, the samprāpti of jvara explains the sequence of events in such a way that the vitiated doṣas, enter the seat of āma, mixes up with heat, trails the first outcome of digestion named rasadhātu, blocks the tracks of rasa and sveda, diminishes the agni, displaces the digestive fire from its location and moves all over the body to emerge out as fever.

Those useful tools for treatment such as met ering each doṣas, rating the power and period will not be useful in the absence of samprāpti, even if the disease is already identified by the emergence of prodromal symptoms. So, Madhukośa reaffirms that all the five, such as the cause, prodromal symptom, sign, positive responses and the life history of disease should be explained. Bhattaraharischandra explains it as the emergence of disease as seen through the determination of doṣas. It should be with a series of affairs that end up in disease. It is not simply the emergence of disease, because some diseases are congenital.

The carefully traced out course of a disease is its samprāpti. The core of samprāpti is known as satta. The course of action in samprāpti will be in accordance to the sattha. Satta is that inherent cause of continuity of the status of inherent causation for those factors developing into manifestations.

Jāti is a synonym which means coming into existence. It points to the source and development of diseases. Āgati means the stretch of disease from the root cause to emergence of disease. Samprāpti is the most important one among the five modules of learning a disease. When it is known fully, understanding the disease becomes complete. Learning samprāpti well, being the most useful tool for treatment, makes naming of diseases less important practically.

The base of absolute differentiation

The difference in samprāpti (etiopathogenic course) makes each disease different from the other. Myriad of distinctiveness in each disorders are generated based on the variations in provocatory factors (hetu) and the objects which gets provocated (dūṣya). Diseases differ from each other by innumerable variations in the natural temperaments, locus or seat, causative factors, manifestations and afflictions to make umpteen kinds of diseases. Causative factors, manifestations and afflictions are discussed separately as nidāna and lakṣaṇa. The remaining are the prakṛti and adhiṣṭāna, the distinct versions of which is the samprāpti. Vikāraprākṛti is described based on the kind of provocation and the course of spread. The outbreak of the disease is based on the locus and scope of the diseases.

Indu mentions that there are occasions when these symptoms, causes, etc. fail to explain the nature of diseases[2]. We may fail to recognise a causative factor for being accustomed for long or by the fact that it is not making a disease in any other people (sādhāraṇatva). We may not give due importance to his everyday complaint

like fatigue as a symptom of that particular disease, which is expected in him being a hard worker. We may also mistake them as cause or symptoms of some other diseases (vyāmoha). Or by any other reason if we do not get the exact nature of illness, there the samprāpti becomes useful to understand diseases. Samprāpti, whether an old textual description or a newly meditated one, should be capable of completely satisfying all enquiries regarding the manifestation. In fact, all other four, causative factors, prodromal symptoms and favorable factors are important by their utility in formulating the samprāpti.

Indeed, samprāpti is completely dynamic in nature. That is why Vijayarakṣita describes it as that origin of disease which is distinguished by the purposefulness of doṣas. Cakrapāṇi also says that "emergence of disease which has that distinct dynamic activity of doṣas associated with disease development". The synonym āgati also hints on the go-ahead nature of samprāpti. It describes the course of illness from its instigating factors to the manifestation of illness along with the interactions and reciprocations during the course. This differentiates learning of samprāpti from the doṣadūṣyajñāna. Since the dynamic activity is inherently associated with the samprāpti, they cannot be separated each other. Doṣa and dūṣya, which has no imbalance, will not generate a disease. So the first dynamic event in the disease development is the doṣas loosing its normalcy. At this phase, learning samprāpti means explaining the quality of aggravating factors like rūkṣa or śīta and other properties. In the next phase of spreading and learning samprāpti, means explaining the interrelations between those aggravated and those spread. In the subsequent phases, learning samprāpti means explaining the strength and brunt of each factors involved, explanations in relation with time, explanations on the status of dūṣya, explaining the involvements of śrotas. When the samprāptijñāna is complete, the understanding of the disease is also complete.

Sāmānya-samprāti

Carakasamhita says when the aggravated doṣas enter into āmāśaya, interact with the digestive fire, follow the course of those components of rasadhātu that has just evolved from the food status to the rasa status after digestion, block the channels of rasa and sveda, diminish the digestive fire and displace it, and gets hold of the whole of the body to generate jvara[3]. This samprāpti of jvara is not sāmkhya-samprāpti, being common for all the eight variants. It is not the description of vikalpa-samprāpti since the amśāmśakalpana is to be explained individually for each case. This does not explain prādhānya and apradhānya. Bala-samprāpti is something to be explained by the physician in each case. Kāla-samprāpti is better explained in terms of manifestations, again which varies from case to case. So, this kind of explanations on samprāpti stands separate as sāmānya-samprāpti. This samprāpti is common for all variants of the disease. All the 8 types of the disease are named as jvara because of a common samprāpti they all have. That is why a set of manifestations are common to all types of jvara.

Viśiṣṭa-samprāpti

This differs in each variants of the disease. The identity of each variant is their individual samprāpti. Such individual identity may sometimes be contributed by extrinsic causes as in fever, cough consequential to trauma. It may be by the evolution of pathological events like in

presence of fluid in udara (ascitis). It may be contributed also by the difference in gradation of doṣas as udakameha is by white, clear, cold properties, ikṣumeha by sweet and cold properties, slimy and condensing property make sāndrameha likewise.

These two are two types of understanding on samprāpti. They exist in the same person in the same context simultaneously. The common samprāpti begins during the sthānasamśraya (lodgment stage). This is the one which first gets shown out well in vyakti (manifestation stage). Latter in this stage the symptoms get specific and well differentiated.

The importance of sāmkhya-samprāpti

A description of samprāpti of a disease should have all of its six components in it for completion. The foremost among them is sāmkhya-samprāpti, which describes the heterogeneous characters within a single samprāpti. Diseases are innumerable. This is due to the countless varieties in temperaments like vāta, basements like dūṣyas, symptoms, multiplicity of extrinsic causative factors like food and activities. They again turn countless by intermixing of doṣas further by their status of increase and diminution, further again by the finest permutation and combination in dūṣyas in their continuous dividing activity, further again by the symptoms of the whole of the disease. Although by the causative factors and their variants they are fathomless, only the deliberated ones are discussed in the scientific literature. When look for their incidence and prevalence, we may find that only limited varieties of a particular samprāpti are physically existing in a given area during any era, as its development is totally dependent on exposure to causative factors in that area during those times. Although symptoms inform us about the details of internal derangement, their nature and peculiarities are known only by samprāpti. When discuss nidāna, sāmkhya refers to those kinds as classified in Aṣṭodarīya. This appears as simple divisions of diseases such as eight types of jvara, five types of gulma, and seven types of kuṣṭha. We may see that the classifications of prādhānya and apradhānya are also numerically referred and differentiated.

This division is based on clear difference in causative factors and deeds of each of them. For instance, such separation is obvious in the six types of arśas i.e. vāta, pitta, kapha, śoṇita, sannipāta and sahaja. They are different each other in their causes like suppression of urges, manifestations like the dry appearance of the pile mass, its symptoms and complications like pain, etc., prognosis, and treatment. This does not make any ativyāpti (overlapping) or avyāpti (omission) of categories in arsas in spite of the possibility of an arśas developing by two doṣas (samsarga) which can make another six varieties; because a homogeneous combination (prakṛti-samavāya) of duel combination (samsarga) of doṣas or triple combination are treated in similar lines of individual doṣas. In addition to that, their treatments do not differ with those of their dominant doṣa. Hence such a differentiation is not necessary. Cakrapāṇi justifies it as the explanations in the texts are detail only about the heterogeneous manifestations which needs discrimination for treatment[4]. This argument makes sāmkhya-samprāpti a classification very useful for practical applications.

Another example of the clear separation is in kṣudrarogas where the mix-up of doṣas, dhātus, and malas does not make different types in each kṣudraroga. Nyāyacandrika focuses this feature

as the reason for explaining them as each one of their kind. Madhukośa also explains the same as an important basis of differentiation to kṣudra-rogas i.e. absence of variants is kṣudratva[5]. Diseases in this category, such as ajagallika, there will not have a variant manifestation or further differentiation as in vraṇa or jvara.

Superficial discussions and understandings on the sāmkhya-samprāpti make it appear as random selection of numbers with a mandatory disposition without any specific reason or benefit. A closer look reveals that this is the principal postulation of disease studies that offers identity to diseases.

Sāmkhya-samprāpti and vidhi-samprāpti

Differentiating them according to intentions of doṣa-vitiation is vidhi-samprāpti. All those classifications that are not under the purview of sāmkhya-samprāpti, such as differences in origin, prognosis, or any other on the basis of the nature and impacts of the disease, are grouped under vidhi-samprāpti.

Both, Vāgbhaṭa and Mādhavakara consider vidhi-samprāpti as a variant of sāmkhya-samprāpti. Gaṇanadhasen also prefers to be with the same opinion. When sāmkhya-samprāpti differentiates groups with uniform features from mixed crowd, the vidhi-samprāpti is a measure to classify them internally. There is no contradiction, repetition or overlapping of sāmkhya-samprāpti by having another classification such as vidhi-samprāpti, rather it adds clarity; because the former deals with basic differentiation of pathogenesis precisely and in the shortest way i.e. it shows only the numbers. The diseases differentiated by sāmkhya-samprāpti will have mutually dissimilar symptoms. But the latter differentiates the same numbers of pathogenesis based on different kinds of activities. They will not have dissimilar symptoms or pathogenesis. But the manner in which the pathogenic activity is proceeded and manifested becomes different from each other. Unlike sāmkhya-samprāpti, there will be no inherent variation among those classified. It is based on the conduct (prakara) of disease. Conduct is that feature of doṣa vitiation which is acquired by virtue of the nature of causative factors. Experts in nyāya say that grouping based on similarity in business is termed as vidhi. Experts in language and grammar also say that grouping based on their subsequent attitudes is termed as prakara, while in grouping under the term bheda, the subsequences are not considered.

The three types of rakthapitta are vidhi-samprāpti. The intrinsic and extrinsic diseases, differentiation based on doṣas as in vātaśoṇita, śvāsa, etc. and prognostic differentiation are some other examples. It is the freedom of the physician to classify diseases according to his basis for classification, which is selected to satisfy his specific intention. So it does not contradict any other type of classifications. Another example is a combination of both, as in a statement like "'three red, two white and five steel are the three types among the ten vessels". So sāmkhya-samprāpti is a more absolute differentiation while the other, vidhi-samprāpti is rather relative classification.

The six modules of understanding samprāpti

Sāmkhya-samprāpti is the number of natural variations in a disease. The number of types in a disease will be same as the number of kinds of doṣa vitiation based on the satta of samprāpti. The variations in the activities of a disease according to difference in causative factors are known as conduct which makes the vidhi-

samprāpti. The conduct of a disease mainly discusses the nature of doṣa vitiation in the disease. Inferring the accumulation and provocation of doṣas by the involved quantitative and qualitative aspects (vikalpa-samprāpti), shows a different aspect of samprāpti which is very important for designing treatment. Assessing the etiopathogenesis by the strength and time of dominance (balakāla-samprāpti) of doṣas is mostly useful in the application of treatments. All these together make the six different perspectives of learning the samprāpti. The part and degree of doṣa vitiation during accumulation and provocation and their possibilities are the determinants in potency, time and the involvement of each doṣa. To understand the umpteen possibilities in the context, they are moderated into modules according to number (sāmkhya), independency (prādhānya), intentions (vidhi), variability (vikalpa), strength (bala) and time (kāla).

The summary of information received from vikalpa and sāmkhya are different. Even with all the information about the disease in hand, we require to check in which category it (sāmkhya) falls in order to adopt the classical treatment principles corresponding to it. Balakāla-samprāpti explains the disease by the peak period of activity. The essence of classification of diseases is sāmkhya-samprāpti, while others adjuncts. Samprāpti, with all its details, right from the core differentiation of diseases, does the most fundamental and comprehensive understanding in study of any disease.

Conclusion

Samprāpti is useful not only in diagnosis but in treatment also. It is impossible to finalize a treatment strategy without the information on doṣa and dūṣya along with their fractional involvement. Only then it will be possible to visualize measures to reverse that particular kind of changes which will in turn cure the disease. An intelligent physician can predict the symptoms of a concealed disease, if he could recognize samprāpti by the analysis of doṣa vitiation. Indu further adds that similarly if samprāpti is known it gives the physician sufficient freedom to use appropriate treatment techniques even though not described in texts.

Samprāpti is the one and only basis of classification of diseases that can differentiate any disease through out its course without avyāpti, ativyāpti or asamgata. This understanding helps practitioners of āyurveda to face challenges raised by ever changing classifications and nomenclature of diseases in the modern era and to avoid the trend of searching for baseless parallels from our system. Sāmkhya-samprāpti is to be recognized as the most important understanding on samprāpti.

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ĀYURVEDIC DRUGS IN BRITISH PHARMOCOPOEIA OF 1948 - A SYSTEMATIC REVIEW

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Abstract: History has enough data to show the ancient Indian bio-diversity. Its rich flora was thoroughly scrutinized and incorporated in Materia Medica in the first century of Christian era by the Greek physician Doiscorides. British Pharmacopoeia of 1948 is full of herbal and mineral preparations out of which 48 āyurvedic single herbal preparations are comprehensively explained.

India is a country with abundant vegetation. It has made encyclopedia of plants and been the centre of excellence in the very ancient time. Ancient Indian sages had practically analyzed almost all the plants and minerals for their efficacy for thousands of years which are known as siddhānt[1]. This variety of prospective had made Indians to faith on the efficacy of medicinal plants. One of the vedic hymens extols thus: *"Oh herbs, nourishing like mother, you are thousand-named and thousand are your growths. You are possessed of thousand powers; release this yajman (soul) of mine from disease"*[2].

The medicinal virtues of Indian plants were known not only in India but to Arabian and Europeans travelers as well[3-5]. A study of Indian and Arabic medical literature reveals that works of Suśurta and Caraka were translated to Arabic[6] and more than 210 plants of Indian origin were added by Unani Physician to their Materia Medica[7]. Hippocrates, father of modern medicine, refers to several Indian plants mentioned in Sanskrit works in his Materia Medica. For e.g., tila (*Sesamum indicum*), jaṭamānsi (*Nardostachys jatamansi*), marica (*Piper nigram*), etc. There is ample evidence to show that Hippocrates borrowed his Materia Medica from āyurvedic sources. 48 āyurvedic and 28 non-āyurvedic drugs referred to in the British Pharmacopoeia of 1948 corroborates this point (Table 1 and 2). Greek physician, Dioscorides has been incorporated Indian plants in his book Materia Medica[8].

Alexander, during his invasion (326 BC), took Indian philosophers and the Brahmins, who were famous for their wisdom, to Greece. Dioscorides's Materia Medica, coming after a possible research activity in the Alexandrian School, reports the action of many drugs. The work had a deep influence subsequently[9] . The De Materia Medica of Dioscorides (1st C. AD)

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TABLE 1

Āyurvedic drugs in British Pharmocopoeia of 1948 (23)

Sl. No	Drug name/Scientific name /Page No.	Parts used	Preparations/ Dosage
01	Babbola / *Acacia senegal* - Arabica / 14, 352	Dried gummy exudation of stem and branches	Mucilage Acaciae, Pulvis Tragacanthe Compositus (Powder) Ti cture of Catechu
02	Vatsanabha / *Aconitum napellus*, A. ferox 34, 47, 308	Dried root	Linimentum Aconiti
03	Kumari / *Aloe vera* /53, 54,416	Evaporating liquid from leaves	Pilula Aloes, Powdered aloes - Ingredient of an extractum colocynthidis compositum, Pilula colocynthidis et Hyoscyami. Pilula rhei composita, mixture of crystalline principles of Aloes -15-30 mg, Pill of aloes-0.25 - 0.5 mg
04	Godhoom / Wheat / 64	Starch from rice, maize, tubers of potatoes	Glycerinum Amyli (wheat starch), Ingredient of Pasta Zinci oxidi Compositae
05	Shatapushpa / *Anethum graveolens* / 64 (Dill fruit)	Dried ripe fruits	Powder
06	Pūtīha / *Mentha piperita* / 77, 173, 381	Dissolved oil of peppermint, oil distilled from fresh flowering tops	Aquamenthae Piperitae Concentrata - 0.06-0.2 ml, oil - 0.3 - 2 ml, Dissolved oil of peppermint - 0.3-1 ml, Emulsiomenthae piperitae, Spiritusmenthae piperitae, oil seen in Cataplasma Kaolini, Pilula Rhei Composita, Tabellae Sodii Bicarbonitis Compositae
07	Soochi / *Belladona pulverata*, *Atropa*, Radix / 88, 90, 92, 182, 184, 308, 565	Powdered belladonna leaf, dried root, root stock, root	Powdered belladonna leaf - 30-200 mg, dry extract of belladonna - 15 - 60 mg, Belladonna Preparata, E xtractum belladonnae siccum, Tinctura belladonnae - 0.3 -1ml, Extractum Belladonnae Liquidum 0.3 - 1 ml, Supporitoria Belladonnae, Linimentum Belladonnae
08	Lobana / *Styrax benzoin* Dryand / 93	Balsamic resin from insciced stem	Adeps Benzoinatus, Tincture Benzoini composita
09	Silhaka / *Liquidambar orientalis* / 493	-	Tinctura Benzoini Composita
10	Kambalaka / *Jateorhiza palmate* /116, 566 (Calumba)	Root cut and dried	Infusum calumbae concentratum, Infusum calumbae, Infusum calumbae Recens Powder –Tinctura calumbae, Tincture of calumba - 2-4 ml.

Cont.....2

Sl. No	Drug name/Scientific name /Page No.	Parts used	Preparations/ Dosage
11	Lanka / *Capsicum minimum* Roxb / 120, 566, 598	Dried ripe fruits	Ointment of capsicum, Unguentum capsici, Powder - Tinctura capsici, Tincture of Capscicum- 0.3-1 ml
12	Yela / *Elettaria cardamomum* Maton / 124, 567	Dried, ripe fruit	Tinctura cardomomi composite, Cardamom seed ingredient of Extractum colocynthidis compositum, Pulvis cretae Aromaticus, Tinctura gentianae composita,Tinctura rhei composita, Compound tincture of cardamom - 2-4 ml
13	Krisha jeeraka / *Carum carvi* / 126, 371	Dried, ripe fruit	Powder Ingredient of Tinctura Cardamomi Composita, Pilula Aloes - 0.06-0.2ml
14	Lavanga / *Eugenia caryophullus* / 129, 239, 371 ?*Sygygium aromaticum*	Dried flower buds	Infusum caryophylli Concentratum, Infusum Caryophylli, Pulvis Cretae Aromaticus, Pulvis Cretae Aromaticus Cum opio, Infusion Caryophylli Pilula– 2-4 ml, Colocynthidis et Hyoscyami-0.06-0.2ml , Oil of clove
15	Khadira / *Uncaria gambier*/ 129, 567	Dried aqueous extract from leaves and young shoots	Powder-Tinctura Catechu – 2-4 ml
16	Twak / *Cinnamomum zeylanicum* / 142, 374	Dried inner bark of coppiced trees	Tinctura Catechu, Pulvis Cretae Aromaticus, Tinctura Cardamomi Composita, oil of cinnamon 0.06 - 0.2 ml
17	Suranjana / *Colchium luteum* / Autumnale149, 150, 185, 187	Corm and seeds	Colchicin 0.5-1mg ,2-8mg total dose, Tinctura Colchici, 0.3-1 ml , Dry extract of colchicum - 10-30mg
18	Indravaruni / *Citrullus colocynthis* / 150	Dried pulp of fruit	Compound extract of colocynth - 0.12 to 5gm, Pill of colocynth- 0.25-0.5g, Pilula Colocynthidis et Hyoscyami
19	Dhanyaka / *Coriandrum sativum* / 153	Dried ripe fruits	Tinctura Rhei Composita-Powder, Oil of Coriander, Elixir Cascarae Sagradae, Extractum Sennae Liquidum-0.06-0.2ml
20	Hritpatri / *Digitalis purpurea* / 166, 167, 531, 532, 569	Dried leaf, Glycoside from leaves	Digitalis preparata, Tinctura digitalis, Tabellae Digitalis Purpurea-30-100mg, Tinctura Digitalis - 30-100mg, Injectio Digoxini-Initial Dose-1-1.5mg, Maintainance - 0.25mg once or twice daily, Tabellae Digoxini - Initial dose -1-1.5mg Maintainance 0.25mg once or twice daily, IV inj 0.5-1mg, Tablet of Digoxin-1-1.5mg Maintainence dose-0.25mg, Tablet of prepared digitalis - 30-100 mg, Tincture of digitalis - 0.3-1ml, Injection of digoxin -10 – 20 ml

Cont.....3

Sl. No	Drug name/Scientific name /Page No.	Parts used	Preparations/ Dosage
21	Swarnapatri / *Cassia augustifolia* / 201, 242, 243, 253, 349, 465, 515	Dried leaflets	Syrupus Sennae- 0.6-2ml, Mistura Sennae Compositae - 15-60ml, Infusum Sennae-2-8ml, Compound mixture of senna - 30-60 ml,Powder Pulvis Glycyrrhizae Compositus - 0.6-2gm,Syrup of Sennae - 2-8ml
22	Tailaparna / *Eucalyptus globulus* / 375	Oil from fresh leaves	Oil of eucalyptus -0.06-0.2ml
23	Yashṭimadhu / *Glycyrrhiza glabra* / 190, 217	Peeled / unpeeled roots and stolon, Unpeeled liquorice in Coarse powder	Extractum Glycyrrhizae, Extractum Glycyrrhizae liquidum, Elixir cascarae Sagradae, Pulvis Glycyrrhizae Compositus - 0.6 - 2gm - Mistura Sennae Compositae - 2-4ml
24	Parasika yavani / *Hyocyamus niger* / 193, 195, 235, 570	Dried leaves and flowering tops	Extractum Hyoscyami liquidum, Tinctura Hyoscyami - 2-4 ml ,.Extractum Hyoscyami siccum,Pilula Colocynthidis et Hyoscyami, Tinctura Hyoscyami- 0.2-0.4ml, Pilula Colycynthidis et Hyoscyami- 16-60mg
25	Kupeelu / *Strychnos nuxvomica* / 199, 362, 492, 572	Dried ripe seeds	Tinctura nuchis Vomicae- 0.06-0.2ml, Dry extract of nuxvomica- 15-60mg, Powder, Extractun Nucis Vomicae Liquidum, Tinctura Nucis Vomicae-0.06-0.2ml, Extractum Nucis Vomicae Siccum, Nux vomica Preparata, Tincture of Nuxvomica-0.6-2ml , Injection Strychninae Hydro-chloridi, Liquor Strychninae Hydrochloridi- 2-8mg,Inj Subcutteneous -2-4mg
26	Mishreya / *Foeniculum vulgare* / 210 (Fennel)	Ripe fruits	Pulvis Glycyrrhizae Compositus
27	Trayamana / *Gentiana lutea* / *kuroo* / 212, 240	Dried fermented rhizome and dried root	Infusum Gentianae Compositum, .Infusum Gentianae Compositum concentratum,.Tinctura Gentianae Composita, Infusion Gentinae Compositum- 2-4 ml
28	Tuvaraka / *Hydnocarpus laurifolia* / 270, 377	Oil from fresh ripe seeds	Injection of hydnocarpus oil - 2ml gradually increased to 5ml, Injectio Olei Hydnocarpi, Oleum Hydnocarpi, Aethylicum, Injectio Olei Hydnocarpi, Aethylici-0.3 -1ml Injectio olei Hydnocarpi Aethylici - 0.3-1ml gradually increase to 4ml, increase to 4 ml

Cont.....4

Sl. No	Drug name/Scientific name /Page No.	Parts used	Preparations/ Dosage
29	Aakhukarni / *Ipomoea orizatensis* / *Reiniformis* / 300	Dried root, mixtures of resins from Ipomoea	Powder-Ipomea Resina, Extractum Colocynthidis Compositum, Pilula Colocynthidis et Hyoscyami - 30-200mg
30	Jambeera / *Citrus limon* / 30, 379, 514, 571	Fresh pericarp of ripe or nearly ripe fruit	Oil of lemon ,Syrupus Limonis-2-8 ml,Tinctura Limonis-, 2-4 ml, infu sum Gentianae, Copositum Concentratum, Spiritus Ammoniae, Aromaticus, Tinctura Valerianae Ammoniata, Syrup of Lemon2-8ml
31	Ahiphen / *Papaver somnifer* / 35, 387, 381, 388,439, 440,537,573,574	Alkaloid of opium, latex from inscision of unripe capsules, moderatly fine powder	Injectio Morphinae et Atropinae, Injectio Morphinae Sulphatis-8-20mgLozenges of morphine, Pulvis create Aromaticus, Pulvis IpecacuanhaeTabellae Acidi Acetyl salcylici, Tabellae Ipecacuanhae, Opium Pulpavaratum, Pulvis create Aromaticus, Pulvis Ipecacuanhae, Tabellae Acidi Acetyl salcylici, Tabellae Ipecacuanhae, Tinctura OpiiTinctura opii Camphorata, Aromatic powder of chalk with opium- 0.6-4gm , Tabellae acidi acetylsalicylic cum Ipecacuanha et Opio, Tabellae Ipecacuanhae et Opii - 0.3-0.6gm,Camphorated Tincture of Opium-
32	Jaatiphala / *Myristica fragrans* / 353, 382	Dried kernel of seeds, powder	Pulvis Cretae Aromaticus, Pulvis CretaeAromaticus Cum Opio, Spiritus Ammoniae Aromaticus, Tinctura Valarianae Ammoniata
33	Guggulu / *Commiphora mukul* / 354,571(Myrrh)	Oleo-gum-resin	Tinctura Myrrhae2-4ml, PilulaRhei Composita-2-4ml
34	Hapusha / *Juniperus oxyedrus* / 369	Wood	Oily Liquid of woody portion
35	Dhanyaka / *Coriandrum sativum* / 153, 374	Seeds	Oil of coriander, Elixir Cascarae Sagradae, Extractum Sennae Liquidum-0.06-0.2ml
36	Karpasa / *Gossypium herbaccum* / 375	Seeds	Fixed oil from seeds
37	Ustukhoodrusa/*Lavandula officinalis* / 379	Oil distilled from fresh flowering tops	Linimentum Camphorae, Ammoniatum

Cont.....5

Sl. No	Drug name/Scientific name /Page No.	Parts used	Preparations/ Dosage
38	Atasi / *Linum usitatissimum* / 380	Fixed oil of ripe seeds	Liquor Cresolis Saponatus
39	Eranda/ *Ricinus communi* / 383	Oil from seeds	Collodium flexile- 4-16 ml
40	Tila taila / *Sesamum indicum* / 384	Seeds	Oil from seeds
41	Dadima/ *Punica granatum* /400	Bark and stem	Mixture of Alkaloids ofBark of root & stem - 0.12-0.5gm
42	Amlaparni / *Rheum palmatum* Emodi / 418, 441, 453	Rhizome	Powder, Pilula Rhei Composita, Pulvis Rhei Compositus,Tinctura Rhei Composita - 0.2-1gm, Compound powder of rhubarb -0.6-4 gm, Compound pill Rhubarb - 0.25-0.5gm, Compoun Tincture of Rhubarb-2-4 ml
43	Kunayana / *Cinchona officinalis* / 445, 446,447,449, 545, 546	Alkaloid of bark	Quinidine Bisulphate cinchona - 60-300mg, Tabellae Quininae Bisulphatis - 0.3-0.6mg,Injectio Quininae-0.3-0.6gm, IV-0.3-0.6gm, Quinine dihydrochloride - 0.3-0.6g, Tablet of quinine bisulphate -0.3-0.6 gm, Tablet of quinine hydrochloride - 0.3-0.6 gm,Injectio Quinanae et Urethani-0.3-0.69gms
44	Vanapalandu / *Urginea maritima* / 462, 486	Bulb	Powder, Acetum Scillae, Syrupus scillae, Oxymel Scillae, Tictura Scillae - 60-200mg, Tincture of squill - 0.3-2 ml
45	Datura / *Datura amonium* / 490	Dried leaves and flowering tops	Powder, Extractum Stramonit Liquidum, Extractum stramonii siccum,Tinctura Stramonii, Tincture of stramonium - 0.3-2ml
46	Ikshu / *Saccharum officinalis* / 496		Sugar Sucrose beet
47	Ardraka/ *Zingiber officinalis* / 516, 578, 579, 624,		Weak tincture of ginger - 2-4 ml, Syrupus Zingiberis 2-8 ml, Tinctura Zingiberis Mitis, Infusum Sennae, Concentratum - 0.3 - 0.6ml
48	Tagara / *Valeriana officinalis* / 616	Dried rhizome and roots	Ammoniated Tincture of Valerianae,Tinctura Valerianae ammoniata-2-4 ml

TABLE 2
Non āyurvedic drugs in British Pharmocopoeia of 1948 (23)

Sl. No	Drug name/Scientific name /Page No.	Parts used	Preparations/ Dosage
01	Agar /*Gelidium amansii* / 47,53	Gelatinous substance, powder	Gelatinous substance. Powder - 4 to 16 gms
02	Orange / *Citrus aurantium* / 82, 83, 236, 237, 283, 512, 564	Outer part of fresh pericarp of ripe or nearly ripe fruit	Tinctura Aurantii, Syrupus Aurantii- 2-8 ml, Infusum Aurantii concentratum, Dried bitter peel is Ingredient of a) Infusum Gentianae compositum concentratum. b) Tinctura Gentianae composita, Infusion of orange peel-15-30ml-to be used by 12 hrs of preparation, Infusum aurantii is concentrated Infusion of Orange Peel -2-4ml, Syrup of Orange
03	Balsam of peru / *Myroxylon Pereirae* klotzscha, Balsamum / 83	Solid or semisolid balsam from incision of trunk	Syrupus Toluntanus,Tinctura tolutana, Balsam of Tolu Ingredient of Tinctura Benzoini Composita
04	Caffeina/ *Camellia sinensis* /104	Dried leaves	Caffeina et sodii Benzoas- 0.3to 0.6gms
05	Cascara sargada/ *Rhamnus purshianus*		Elixir Cascarae Sagrade, Elixir Cascarae Sagrade Liquidum, Elixir Cascarae Sagrade Siccum
06	Cocaina / *Erythroxylum cocaham* /142	L-eaves	Alkaloid from leaves
07	Colchium corm/ *Colchicum autumnale* / 147	Corm	Extractum colchici siccum,Tincture of Colchium-0.3-1ml, Liquid extract of Colchium-Tinctura Colchici-0.5-1g, 2-8mg Total Dose, Dry extract of Colchium-10-30mg
08	Colocynth/ *Citrullus colocynthis* / 150 - Indravaruni	Dried pulp of fruits	Pilula colocynthidiset Hyoscyami, Compound Extract of Colocynth - 0.12-.5gm, Pill of Colocynth & Hyoscyamus - 0.25-0.5gm
09	Clophony /152	Residue from oleoresin	Collodium Flexile
10	*Dryopteris filix*/208 (Male Fern)	Rhizome from bases of apical bud,divested roots	Extractum Filicis

Cont.....2

Sl. No	Drug name/Scientific name /Page No.	Parts used	Preparations/ Dosage
11	Senega / *Polygala senega* / 241, 464, 575	Dried root	Powder, Extractum Senagae Liquidum, Infusum senagae Concentratum- 2-4 ml Tinctura Senegae, Infusum senegae, Tincture of senega- 2-4 ml
12	Ipecacuanha / *Cephaelis ipecacuanha* / 195, 298,440,537,571	Dried root and rhizome	Powder Extractum Ipecacuanha Liquidum, Tinctura IpecacuanhaIpecacuanha Preparata, Pulvis Ipecacuanha et Opii, Trochisci Morphina et Ipecacuanha, Pulvis Ipecacuanha et Opii, Tabellae Acidi Acetylsalicyliccum Ipecacuanha et Opii-0.3gms-0.6gmsi,Tabellae Ipecacuanha et Opii, Trochisci Morphinae et Ipecacuanha(30-120mg) and Emetic Dose-1-2gms,Liquid extract of Ipecacunha - Tinctura Ipecacuanha Metric Dose 0.03-0.12ml & Emetic Dose 0.6-2ml, Tablet of Ipecacuanha & Opium-0.3-0.6g, Tincture of Ipecacuanha -0.6-2ml, Tincture of Ipecacuanha Emetic Dose-15-30ml
13	Krameria/ *Krameria triandra* / 303, 590,591	Dried root	Powder, Extractum Krameria Siccum, Trochisci KrameriaeTrochisci Krameriae et Cocaine-0.6-2gm, Lozenges of Krameria, Morphine, & Ipecacuanha, Lozenges of Krameria, Lozenges of Krameria and Cocaine
14	Almond oil / *Prunus amygdalus* Batsch / 367, 368	Seeds	Fixed oil of 15-30 ml, Emulsio olei Morrhuae is purified volatile oil of bitter Almond
15	Oil of aniseed / *Pimpinella anisum* / 369	Dried fruits	Elixir Cascarae Sagrada, Tinctura Opii Comphorata - 0.06- 0.2ml
16	Oil of cajuput / *Malaleuca leucadendron* / 371,485	Fresh leaves and twigs	Oil distilled from fresh leaves & twigs, Spiritus Cajuputi - Oil distilled from fresh flowering & fruiting plant 0.06 - 0.2ml Spirit of Kajuput - 0.8-2ml Hydrargyri Nitratis forte—15-30 ml

Cont.....3

Sl. No	Drug name/Scientific name /Page No.	Parts used	Preparations/ Dosage
17	Oil of chinopodium / *Chinopodium ambrosides* / 373	Flower and fruits	Oil distilled from fresh flowering & fruiting plant excluding roots- 0.2 - 1 ml
18	Olive oil/ *Olea europaea* /	Fixed oil of ripe fruits	Unguentum Hydrargyri Compositum, Unguent
19	Oil of rosemary/ *Rosemarinus officinalis* /384	Oil from flowering plants	Linimentum Saponis
20	Oil from theobroma / *Theobroma cacao*/ 385	Seeds	Solid fat from roasted seeds
21	Ouabain/ *Strophanthus gratus* / 485	Crystalline glycoside from seeds	Injectio ouabaini-IV – 0.1-0.25ml
22	Podophyllum/ *Podophyllum peltatum* / *hexandrum* / 421, 423,	Dried rhizome roots, resin	Powder, Podophylli Resina - 0.12gm-0.6gm, Resin 15-60 mg
23	Wild cherry bark /*Prunus serotina* / 437,515	Dried bark	Powder, Syrupus Pruni Serotinae,Syrup of wild Cherry- 2-8ml
24	Tragacanth/ *Astragalus* / Gummifer / 587	Dried gummy exudates from incision	Powder, Mucilago Tragacanthae, Pulvis Tragacanthae Compositus
25	Quassia/ *Picraena excelsa* / 442,574	Dried stem wood	Powder, Infusum Quassiae Concentratum, Infusum Quassiae, Infusum QuassiaeRecens, Tinctura Quassiae - 2-4 ml
26	Strophanthus / *Strophanthus kombe* / 491	Dried ripe seeds	Powder, tinctura Srophanthi-0.12-0.3ml
27	Totaquine/ *Cinchona officinalis* / *succirubra* / 580	Bark	Alkaloid from bark - 0.3-0.6 gm
28	Extract of malt / *Hordeum distichon* / 197	Malted grain of barley or wheat	Extractum malti cum Oleo Morrhuae- 4-30ml in divided dose

reports about 200 plants used for the treatment of pathologies of the urogenital tract[10,11]. In a classic, *India in Greece*, Pococke, the Greek historian, describes how Aryans migrated from India to Greece via Sumeria and many other countries[12]. Professor B.M. Hegde, in his work *Wisdom of the Human Body*, narrates how vaccination against small pox was in practice in India. One of the Fellows of the Royal college of Physician of London, T.Z. Holwell along with twenty other fellows studied the wisdom of India including vaccination against small pox in eighteenth century and awarded a noble prize to Edward Jenner[13].

The growth and popularity of ancient Indian system of medicine was suppressed by British during their rule by bringing their physicians and encouraging Indians to use readymade preparations imported from Europe. Though western medicine has reached standard, ancient Indian medicinal plants have found place in British Materia Medica[8]. Even in present era, 75-80% of global population depends on crude extract and preparation of medicinal plants for their health problems[14-20].

In the beginning days of modern medicine, isolated active compound played vital role to give immediate effect in relieving pain. In the British Pharmacopoeia of 1932 more than 70% of organic monographs are on plant-derived products[14]. Introduction of synthetic medicines significantly declined the plant derived medicinal agents to approximately 20% in the British Pharmacopoeia of 1980.

Famous historian Neuberger M, in his classic *History of Medicine*, has concluded that "Greek medicine adopted Indian medicaments and methods which are evident from the literature."[21]

Conclusion

Though Max Muller estimated the period of Vedas to be around 2500-3000 years, there are large numbers of data to show that they are at least 10000-15000 years aged. In other words, they have no beginning. Contemporary science has been harvesting the Indian wisdom after having realized its powerful efficacy. In the earlier days there was more stress on herbal drugs which has declined drastically, but the present trend is showing more inclination towards herbal medications suggesting that a day is not far off to see revival of the earlier days all over the world.

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EXCERPTS FROM CIKITSĀMAÑJARI - LIX

P. Unnikrishnan*

Abstract: The causative factors of different types of netraroga (eye diseases) and their various treatments are discussed in this issue.

TREATMENT OF NETRAROGA

Consumption of food that are unwholesome and difficult to digest, rich in water content, highly acidic or alkaline, excessively cold, stale or overcooked, excessively pungent and hot; all these are causative factors for the diseases of the eye. Smelling of pungent substances, excessive laughter, speaking for long time, excessive anger, sorrow and continuous watching for long time can also precipitate eye diseases. Excessive indulgence in alcoholic beverages, lechery, injury of the head, remaining submerged in water for long period, resting the head on a high pillow with head hanging backwards, resting the head with nose directed downwards, exposure to dust, smoke, suppression of tears, vomiting and other non suppressible urges, inordinate vomiting during the process of emesis, observing minute objects for long time, trying to observe objects that are beyond visual range, excessive sweating, etc. predispose eye diseases. Submerging in cold water immediately after prolonged exposure to heat, keeping awake at night and sleeping during the day - all are causative factors. Habitual consumption of śukta, āranāḷa, sour items, horse gram and black gram will also damage the eye.

Causes for the vitiation of doṣas are discussed in detail in the chapter Sarvaroganidāna (Aṣṭāṅgahṛdayam, Nidānasthānam, Chapter 1). Due to the factors that are damaging the eye, doṣas in general, travel along the path of pitta and spread upwards through the blood vessels and reach the eyes. They later give rise to specific diseases affecting the eyelids (pakṣma) and conjunctiva (vartma), canthus (sandhi), sclera (śukḷa), cornea (krisṇa), lens (dṛṣṭi) or the whole eye.

For all diseases affecting the eye, the first treatment is irrigation by instilling medicated water in drops (aścyotana). This process relieves pain, itching, bristling (harṣa), lachrymation, burning and redness. From the third day onwards, lachrymation can be treated by aścyotana.

Tarpana

Satiation of the eye (tarpana) is a process where the eyes remain submerged in medicated liquid

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such as ghee for varying period of 100 to 1000 seconds (mātra) depending upon the doṣa and site affected. The patient's face is subjected to sudation by water vapor. A water-tight wall is created surrounding each eye with a paste prepared from black gram in such a way that there is no hindrance to open or close the eyelids. Ghee is molten in a vessel to make it free from sediments and the supernatant clear portion, sufficiently warm is poured into the walls while the eyelids are closed. The level of ghee should be above the level of cilia. The patient is then directed to open and close the eyelids gently up to the prescribed time. Afterwards, the ghee is drained through a hole of the wall near the lateral canthus. A bolus prepared from yava paste, suitably warmed is then used to sudate the eye for the relief of clumsiness caused by the ghee. Medicated fumes are inhaled for the same purpose to get rid of accumulated residual kapha. This process is nutrient to the eye and elevates sunken eyes to normal. It also creates clarity and stability of vision.

The names of diseases that affecting the eyes are: kṛchronmīla, nimeṣa, vātahata, kumbhīka, pittolkḷiṣṭa, pakṣmaśātam, pothaki, kapholkḷiṣṭam, lagaṇa, utsaṅga, kḷiṣṭa, arśovartma, añjanā-pidaka, visavartmam, utkḷṣṭavartmam, śyāmava-rtmam, śḷṣṭavartmam, sikatāvartmam, kardama, bahaḷa, kukūṇaka, pakṣmoparodha, ālaji and arbuda.

Kṛchronmīla can be cured by medicines, whereas nimeṣa, vātahata and arśovartma are incurable. Pakṣmoparodha can be managed. All other diseases are curable by medicines or surgical measures.

Kṛchronmīla

Old ghee medicated with the kaṣāya of drākṣa (*Vitis vinifera*) as liquid component and a paste of drākṣa as solid component, on consumption added with sugar, cures kṛchronmīla. Nasya (nasal medication), dhūma (inhalation of medicinal fumes) and añjana (collyrium) that are oily (snigdha) can also be used. Nasya with Trimadhura ghṛtam (explained elsewhere) in the evening or with breast milk, and consumption of Jīvantyādi ghṛta after supper, are also indicated.

Kumbhikāvartma

Fraying the interior of the upper eye-lid and permitting the free flow of secretions that contain tissue debris (pratisāraṇa), and irrigation with the kaṣāya prepared from yaṣṭī (*Glycyrrhiza glabra*), dhātri (*Emblica officinalis*) and paṭola (*Trichosanthes lobata*) are the treatments for this disease. Properly frayed region will be smooth and glistened like nail, and the signs such as edema and itching will be absent. Follicular appearance of the region is lost and it becomes smooth. In cases of insufficient fraying these symptoms are absent and, re-fraying is required. In excessive fraying, pain, falling of cilia and drooping of eyelids are seen. Here, treatments to pacify vāta such as oleation (snehana) and sudation (svedana) are indicated.

Make a combination of fine powder of śvetalodhra (*Symplocos racemosa*) mixed with butter and fine paste of eraṇḍamūla (*Ricinus communis*), and subject to puṭapāka. The expressed juice taken from it after puṭapāka, mixed with breast milk or goat's milk, is to be used for irrigation of the eye. Eye that is elevated and hard in consistency (pidakā) should be incised with vrīhipatra (an instrument used for incision) and the accumulated pus and tissue debris are to be cleaned by pressing.

Consumption of ghee medicated with the drugs

specified in Madhura gaṇa relieves pittolkḷiṣṭa and raktolkḷiṣṭa. When the patient becomes sufficiently snigdha, venesection (siramokṣa) and purgation with trivṛta (*Operculina turpethum*) and triphala (*Terminalia chebula, Emblica officinalis* and *Terminalia bellirica*) are advised. After fraying and blood letting, washing of the eyes with the kaṣāya prepared from yaṣṭi and irrigation by milk medicated with candana (*Santalum album*) are recommended.

Falling of cilia (pakṣmaśata) is treated by irritating the hair-follicles with a needle, or by applying leech. Induction of emesis after drinking milk or sugar cane juice, and nasya with ghee medicated with sweet (madhura) and cold potency (śītavīrya) drugs are also indicated.

After fraying, potaki is subjected to pratisāraṇa with the powders of śuṇṭhi (*Zingiber officinale*) and saindhava (rock salt). Washing with warm water and irrigation of the eye with kaṣāya prepared from khadira (*Acacia catechu*), āḍhaki (*Cajanus cajan*) and śigru (*Moringa oleifera*). Kapholkḷiṣṭa is subjected to fraying and pratisāraṇa with the fine powders of the following mixed with honey.

Saindhava	Rock salt
Kāsīsa	Onsulphate
Manohva	Realgar
Kaṇa	*Piper longum*
Tarkṣya	Emerald

All treatments indicated for clearing of kapha such as vomiting (vamana), collyrium (añjana), nasya, etc. are to be done. All treatments of kapholkḷiṣṭa are to be done in lagana also. If those treatments do not bring the desired result, cauterisation of the affected portion is to be done.

In kukūṇaka, the mother or dhātri (surrogate mother who gives breast milk to the infant) should be subjected to the process of emesis (vamana) after drinking ghee medicated with kṛṣṇa (*Piper longum*), yaṣṭī (*Glycyrrhiza glabra*), sarṣapa (*Brassica juncea*) and saindhava (rock salt). Dhātri should be subjected to purgation by consuming a kaṣāya prepared from abhaya (*Terminalia chebula*), pippali (*Piper longum*) and drākṣa (*Vitis vinifera*). Fine paste prepared from the following is to be applied on the nipple, before giving breast milk.

Musta	*Cyperus rotundus*
Dvirajani	*Curcuma longa*
	Berberis aristata
Kṛṣṇa	*Piper longum*

Generally, the diet of a child is rich with milk and ghee that causes to increase kapha; hence, in most of children's diseases, vomiting is the first line of treatment, especially in kukūṇaka. Ghee mediated with saptalārasa (expressed juice of *Bacopa monnieri*), on consumption causes vomiting and purging. Fine powders of the following made to a paste, rolled like a wick and dried, on application as collyrium relieves kukūṇaka.

Dviniśa	*Curcuma longa*
	Berberis aristata
Lodhra	*Symplocos laurina*
Yaṣṭyāhva	*Glycyrrhiza glabra*
Rohiṇī	*Picrorhiza kurroo*
Nimbapallava	*Azadirachta indica* (leaves)
Tāmra raja	Copper powder

18 types of diseases grouped as pilla viz. Pittolkḷiṣṭam, Kapholkḷiṣṭam, Rakttolkḷiṣṭam, Sannipātolkḷiṣṭam, Kukūṇaka, Pakṣmoparodha, Śuṣkākṣipāka, Pūyālasa, Visavartma, Pothaki, Amḷoṣitam, Alpaśopha, Kaphābhiṣyandam,

Pittabhiṣyandam, Raktabhiṣyandam, Kaphādhimandham, Pittādhimandham and Raktādhimandhamare are always associated with impaired vāta and are chronic.

Ash obtained by burning kārpasamūla (*Gossypium herbaceum*) is to be rubbed with a copper probe (śalāka) in a bronze (kāmsya) vessel and made to a paste with breast milk. Application of this as collyrium relieves pilla diseases. Mix the ash of kārpasamūla with expressed juice of jāti (*Jasminum grandiflorum*) and expose to sun (bhāvana) in a brass vessel till the water content evaporates. Add butter prepared from buffalo milk and ground to a paste in the same vessel using a copper probe. Application of this medicine as collyrium also relives pilla.

Dhātri rasa (juice of *Emblica officinalis*) and amḷapatrarasa (juice of *Tamarindus indica*) are to be boiled and reduced to become dense. Fine powders of saindhava, tūtha (*Copper sulphate*) and mādhvī (honey) are to be added to this kaṣāya to form a paste. Application of this medicine on the eyelids relives diseases of the lids. Pyogenic or suppurative lesions of the eye and itching of eyelids are relieved by application of the above medicine.

Add the kaṣāya detailed for Eḷanīrkuzhampu with kaṣāya of dhātrirasa (juice of *Emblica officinalis*) and amḷapatra (*Tamarindus indica* - leaves) (both prepared separately and mixed together) and reduce to dense consistency; and fine powders of the following are to be added and mixed well. Application of this medicine on the eyelids also relieves pilla. Application of Eḷanīrkuzhampu (see verse 72) is also good.

Tūtha	Copper sulphate
Induppu	Rock salt
Karpūram	*Dryobalanops aromatica*
Pītarohiṇi	*Cpotis teeta*

Deranged vāta spreads along the blood vessels and initiates secretion of watery tears from the junction of eyelids and sclera (palpebro - scleral junction) at the medial canthus due to vitiation of the lachrymal apparatus, and eyes become edematous, red and painful. This disease is termed as jalasrāva. The junction of eyelids and sclera (vartmaśukḷasandhi) are the site of 9 diseases viz. jalasrāva, kaphasrāva, upanāha, raktasrāva, parvaṇī, pūyāsrāva, pūyālāsa, alajī and kṛmigrandhi.

Application of collyrium prepared from a mixture of rasāñjana (Copper vitriol) one part, fine powder of yaṣṭīmadhuka (*Glycyrrhiza glabra*) four parts and antimony relieves lachrymation. Application of Eḷanīrkuzhampu or Dārvīvalkalādi as collyrium is also good.

Upanāha, kṛmigrandhi, pūyālāsa and parvaṇi are to be treated surgically. Alajī, jalasrāva, kaphasrāva, raktasrāva and pūyāsrāva are incurable.

Śuktika is a disease affecting sclera (śukḷa). Impaired pitta causes black, grey or yellow spots or sclera may appear muddy without burning sensation or pain. Fever, thirst, diarrhea, etc. will also be present. The following 13 diseases affect the sclera:

Śuktika, śukḷārma, valāsagrathita, piṣṭhaka, sirolpāta, sirāharṣa, sirājāla, śoṇitārma, arjuna, prastāryarma, snāvarma, adhimāmsārma and sirāpiṭakā.

Of the above, śuktika, sirāharṣa, sirolpāta, piṣṭhaka, valāsagrathita and arjuna are treated by medicines, and the remaining by surgery. Eḷanīrkuzhampu or Karpūrādi kuzhampu can be used as collyrium. Darvīvalkalādi raskriya, earlier mentioned in this chapter, is detailed below.

A paste prepared from the following mixed with honey, on application as collyrium, relieves all pilla diseases (detailed earlier). Redness, lachri-

mation, night blindness, white scars in the cornea, cataract and other eye diseases are also cured.

Dārvīvalkala	*Berberis aristata* - bark
Saindhava	Rock salt
Añjana	black antimony
Kaṇa	Piper longum
Tūtha	Copper sulphate
Abdhiphena	Sponge
Oṣaṇa	*Piper nigrum*
Yaṣṭi	*Glycyrrhiza glabra*
Tāmra	Copper powder

Karpūrādi kuzhampu detailed below is effective for sarvākṣirogas (diseases affecting whole eye) and diseases of eyelids. Fine powders of the following mixed with old ghee and honey is to be used as collyrium.

Karpūram	*Dryobalanops aromatica*
Saindhava	Rock salt
Upakulya	*Piper longum*
Dhātriphalam	*Emblica officinalis*
Oṣaṇakam	*Piper nigrum*
Pītakarohiṇī	*Cpotis teeta*

Fine powders of the following mixed thoroughly and applied as such relieves white scars in the cornea (śukḷa), pterygium (arma), etc. by virtue of its fraying (lekhana) property.

Candanam	*Santalum album*	1 part
Saindhvam	Rock salt	2 parts
Pathya	*Terminalia chebula*	3 parts
Palāśataru	*Butea monosperma*	4 parts
Śoṇita	*Crocus sativus*	5 parts

Sub-conjunctival hemorrhage (arjuna) is a disease characterised by blood-red coloured spot on sclera (like the blood of the rabbit) without pain. Irrigation of the eye with whey added with sugar and honey relieves arjuna. Madhukāñjana prepared from sphaṭika (fine powder of crystal), kuṅkuma (*Crocus sativus*), śaṅkha (conch), madhuka (*Glycyrrhiza glabra*) and madhukāñjana (*Moringa concanensis*) used as collyrium relieves arjuna. Fine powders of śaṅkha, phena (sponge) and sugar, mixed with honey to a paste can also be applied as collyrium.

Flowers of nantyārvaṭṭam (*Tabernaemontana divaricata*) ground in milk can be used for irrigation. One time irrigation with candanādi powder (śloka 42) mixed with water can also be done. Expressed juice from mildly cooked stem of karimpana (*Borassus flabellifer*) mixed with honey can also be used for irrigation. This preparation is also good for redness (pūvu).