ISSN 0970 - 4086

Āryavaidyan

लाभानां श्रेय आरोग्यम्

Of all the gifts,
the most precious is health

Vol. XX1, No. 3
February - April, 2008

A QUARTERLY JOURNAL OF
THE ARYA VAIDYA SALA - KOTTAKKAL

āryavaidyan

A Quarterly Journal of
the Arya Vaidya Sala, Kottakkal.

Vol. XXI., No. 3 | Regn. No. 55127/87 | February - April, 2008

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.

Vol. XXI., No. 3, February - April 2008

CONTENTS

Aryavaidyan Vol. XXI., No.3, Feb. - Apr. 2008, Pages 131 - 139

FROM THE PAGES OF VĀGBHAṬA - LXXVIII

Dr. A. Raghunathan*

Abstract: Here, in the last part of the chapter on vikṛti, the context of predicting death is detailed. Major portions of rogariṣṭam, instant riṣṭa features, warnings for physician and the objective of the context are highlighted.

Rogariṣṭam

अतीसारो यकृत्पिण्डमांसधावनमेचकै: ।। ८० ।।
तुल्यस्तैलघृतक्षीरदधिमज्जवसासवै: ।
मस्तुळुङ्गमषीपूयवेसवाराम्बुमाक्षिकै: ।। ८१ ।।
अतिरक्तासितस्निग्धपूत्यच्छघनवेदन: ।
कर्बुर: प्रस्रवन् धातून् निष्पुरीषोऽथवाऽतिविट् ।। ८२ ।।
तन्तुमान् मक्षिकाक्रान्तो राजीमांश्चन्द्रकैर्युत: ।
शीर्णपायुवलिं मुक्तनाळं पर्वास्थिशूलिनम् ।। ८३ ।।
स्रस्तपायुं बलक्षीणमन्नमेवोपवेशयन् ।
सतृट्श्वासज्वरच्छर्दिदाहानाहप्रवाहिका: ।। ८४ ।।

(atīsāro yakṛtpiṇḍa-
māmsadhāvanamecakai: ।। 80 ।।
Tulyastailaghṛtakṣīra-
dadhimajjavasāsavai: ।
mastuḷuṅgamaṣīpūya-
vesavārāmbumākṣikai: ।। 81 ।।
Atiraktāsitasnigdha-
pūtyacchaghanavedana: ।
karbura: prasravan dhātūn
niṣpurīṣoऽthavāऽtiviṭ ।। 82 ।।
Tantumān makṣikākrānto
rājīmāmścandrakairyuta: ।
śīrṇapāyuvalim mukta-
nāḷam parvāsthiśūlinam ।। 83 ।।
Srastapāyum balakṣīṇa-
mannamevopaveśayan ।
satṛṭśvāsajvaracchardi-
dāhānāhapravāhikā: ।। 84 ।।)

Atisāra (diarrhea), if (the fecal material being evacuated) resembles with slices of liver, water in which meat washed, gingelly oil, ghee, milk, curd, bone marrow, vasa, āsava, intracranial liquid, soot/collyrium, pus, liquids seen along with chops of flesh and honey; if it is with more sanguine, black, oily, foul smelling or with much clear and viscous and producing pain on evacuation; if it is multi-coloured, evacuates primary tissues (dhātūs); sometime with no faces or at times, with more fecal material; if there is appearance of strings-like in the evacuated material, affliction of flies, appearance of lines, many colours as if in a peacock's feather; expelling of undigested food; if it is associated with compli-cations such as over-thirst, dyspnoea, fever, vomiting, burning sensation, flatulence and strain for defecation, kills the patient by impairment of anal rings, anal orifice,

*"Amṛtālayam", Thozhupadam (PO), Chelakkara (Via), Thrissur - 680 586, Kerala

afflicted with pain in the joints and bones, prolapsed anus and diminishing strength.

अश्मरी शूनवृषणं बद्धमूत्रं रुजार्दितम् ।
मेहस्तृड्दाहपिटिकामांसकोथातिसारिणम् ।। ८५ ।।
(Aśmarī śūnavṛṣaṇam
baddhamūtram rujārditam ।
mehastṛḍdāhapiṭikā-
māmsakothātisāriṇam ।। 85 ।।)

The disease aśmari (calculus) causes death when the patient appears with swollen testes, urinary obstruction and severe pain. Severe thirst (a particular individual disease), burning sensation, carbuncles, putrefaction of flesh and diarrhea are the fatal signs of a diabetic patient.

पिटिका मर्महृत्पृष्ठस्तनांसगुदमूर्द्धगा: ।
पर्वपादकरस्था वा मन्दोत्साहं प्रमेहिणम् ।। ८६ ।।
सर्वे च मांससङ्कोथदाहतृष्णामदज्वरै: ।
विसर्पमर्मसंरोधहिध्माश्वासभ्रमक्ळमै: ।। ८७ ।।
(Piṭikā marmahṛtpṛṣṭha-
stanāmsagudamūrddhagā: ।
parvapādakarasthā vā
mandotsāham pramehiṇam ।। 86 ।।
Sarve māmsasaṅkotha-
dāhatṛṣṇāmadajvarai: ।
visarpamarmasamrodha-
hidhmāśvāsabhramakḷamai: ।। 87 ।।)

Carbuncles appear on the vital regions, mediastinum, back of the body, the breast, the shoulder, the anal region, the head and the joints or at the limbs cause to kill a diabetic patient who is careless in the treatment. Carbuncles, associated with putrefaction of flesh, burning sensation, thirst, intoxication, fever, cellulitis, and when these afflict the vital points and attack along with hiccup, dyspnoea, vertigo and fatigue, is fatal even for non-diabetic patients.

गुल्म: पृथुपरीणाहो घन: कूर्म इवोन्नत: ।
सिरानद्धो ज्वरच्छर्दिर्हिध्माध्मानरुजान्वित: ।। ८८ ।।
कासपीनसहृल्लासश्वासातीसारशोफवान् ।
(Gulma: pṛthuparīṇāho
ghana: kūrma ivonnata: ।
sirānaddho jvaracchardi-
hidhmādhmānarujānvita: ।। 88 ।।
Kāsapīnasahṛllāsa-
śvāsātīsāraśophavān ।)

Gulma, if develops widespread, hardened, protruded like a tortoise, entangled with veins and associated with fever, vomiting, hiccup, flatulence, pain, cough, coryza, chest-discomfort, dyspnoea, loose-motion and oedema, is to be reckoned fatal.

विण्मूत्रसङ्गहश्वासशोफहिध्माज्वरभ्रमै: ।। ८९ ।।
मूर्च्छाच्छर्द्यतिसारैश्च जठरं हन्ति दुर्बलम् ।
शूनाक्षं कुटिलोपस्थमुपक्लिन्नतनुत्वचम् ।। ९० ।।
विरेचनहृतानाहमानह्यन्तं पुन: पुन: ।
(viṇmūtrasaṅgrahaśvāsa-
śophahidhmājvarabhramai: ।। 89 ।।
Mūrcchācchardyatisāraiśca
jaṭharam hanti durbalam ।
śūnākṣam kuṭilopastha-
mupakḷinnatanutvacam ।। 90 ।।
Virecanahṛtānāha-
mānahyantam puna: puna: ।)

Udara disease associated with constipation, dysuria, dyspnoea, oedema, hiccup, fever, vertigo, stupor, vomiting and loose motion, kills one who is weak, with swollen eyes, curved penis, wet skin and body and having flatulence (though abated by number of purgation).

पाण्डुरोग: श्वयथुमान् पीताक्षिनखदर्शनम् ।। ९१ ।।
तन्द्रादाहारुचिच्छर्दिमुर्च्छाध्मानातिसारवान् ।

अनेकोपद्रवयुत: पादाभ्यां प्रसृतो नरम् ।। ९२ ।।
नारीं शोफो मुखाद्धन्ति कुक्षिगुह्यादुभावपि ।
राजीचित: स्रवंश्छर्दिज्वरश्वासातिसारिणम् ।। ९३ ।।

(pāṇḍuroga: śvayathumān
pītākṣinakhadarśanam ।। 91 ।।
tandrādāhārucicchardi-
murcchādhmānātisāravān ।
anekopadravayuta:
pādābhyām prasṛto naram ।। 92 ।।
Nārīm śopho mukhāddhanti
kukṣiguhyādubhāvapi ।
rājīcita: sravamśchardi-
jvaraśvāsātisāriṇam ।। 93 ।।)

Pāṇḍu, associated with edema spread all over the body, becomes the cause of death of one whose eyes and nails and the objects he sees are yellow. Śopha (edema) along with lassitude, burning sensation, anorexia, vomiting, stupour, flatulence, loose motion and other complaints, if begins from the feet and spread to upward, kills male, and if it begins in the central part of the body i.e. in the urinary bladder area or in the genital area and spreads upward and downward, kills both (male and female). Śopha that causes lines all over the body with profuse discharge kills one who is having complaints of vomiting, fever, dyspnoea and loose motion.

ज्वरातिसारौ शोफान्ते श्वयथुर्वा तयो: क्षये ।
दुर्बलस्य विशेषेण जायन्तेऽन्ताय देहिन: ।। ९४ ।।

(jvarātisārau śophānte
śvayathurvā tayo: kṣaye ।
durbalasya viśeṣeṇa
jāyanteऽntāya dehina: ।। 94 ।।)

The occurrence of fever and loose motion on the end of śopha and contrarily, the appearance of śopha at the end-stage of fever or loose motion, are to be considered life-threatening especially for a weak person.

श्वयथुर्यस्य पादस्थ: परिस्रस्ते च पिण्डिके ।
सीदत: सक्थिनी चैव तं भिषक् परिवर्जयेत् ।। ९५ ।।
आननं हस्तपादं च विशेषाद्यस्य शुष्यत: ।
शूयेते वा विना देहात्स मासाद्याति पञ्चताम् ।। ९६ ।।

(Śvayathuryasya pādastha:
parisraste ca piṇḍike ।
sīdata: sakthinī caiva
tam bhiṣak parivarjayet ।। 95 ।।
Ānanam hastapādam ca
viśeṣādyasya śuṣyata: ।
śūyete vā vinā dehāt-
sa māsādyāti pañcatām ।। 96 ।।)

A physician should avoid a patient whose both the feet are afflicted by oedema, both calf areas flaccid and both the legs are much debilitated. One may die within a month whose face and limbs are afflicted with muscle-wasting or with massive oedema, when the body is not affected with such complaints.

Today also some of the vaidyas give priority to this feature of transfer of oedema with a particular pattern specific to male and female as described above. According to their opinion this feature is much practical in most of the cases to predict a death.

विसर्प: कासवैवर्ण्यज्वरमूर्च्छाङ्गभङ्गवान् ।
भ्रमास्यशोफहृल्लासदेहसादातिसारवान् ।। ९७ ।।

(Visarpa: kāsavaivarṇya-
jvaramūrcchāṅgabhaṅgavān ।
bhramāsyaśophahṛllāsa-
dehasādātisāravān ।। 97 ।।)

Visarpa (cellulitis) is fatal if associated with cough, discoloration, fever, stupor, whole body

pain, vertigo, dryness of mouth, discomfort in the chest area, fatigue and loose motion.

कुष्ठं विशीर्यमाणाङ्गं रक्तनेत्रं हतस्वरम् ।
मन्दाग्निं जन्तुभिर्जुष्टं हन्ति तृष्णातिसारिणम् ।। ९८ ।।
(Kuṣṭham viśīryamāṇāṅgam
raktanetram hatasvaram ।
mandāgnim jantubhirjuṣṭam
hanti tṛṣṇātisāriṇam ।। 98 ।।)

Kuṣṭha will lead to death making the affected areas to fall off, with reddish eyes, feeble voice, weak digestive capacity, wounds in the affected areas with worms and with severe thirst and loose motion.

वायु: सुप्तत्वचं भुग्नं कम्पशोफरुजातुरम् ।
वातास्रं मोहमूर्च्छायमदास्वप्नज्वरान्वितम् ।। ९९ ।।
शिरोग्रहारुचिश्वाससङ्कोचस्फोटकोथवत् ।
(Vāyu: suptatvacam bhugnam
kampaśopharujāturam ।
vātāsram mohamūrcchāya-
madāsvapnajvarānvitam ।। 99 ।।
Śirograhāruciśvāsa-
saṅkocasphoṭakothavat ।)

Vātaroga in the final stage shows the characteristic features of loss of sensation in the skin, crippling of the affected parts, severe tremors, oedema and pain. The fatal complications of vātaśoṇita are coma, stupor, intoxication, insomnia, fever, stiffness in the head, anorexia, dyspnoea, muscular contractions, cracking pain and putrefaction of affected body parts.

शिरोरोगारुचिश्वासमोहविड्भेदतृड्भ्रमै: ।। १०० ।।
घ्नन्ति सर्वामया: क्षीणस्वरधातुबलानलम् ।
(śirorogāruciśvāsa-
mohaviḍbhedatṛḍbhramai: ।। 100 ।।
Ghnanti sarvāmayā: kṣīṇa-
svaradhātubalānalam ।)

Generally, all the diseases take life of those who are debilitated in voice, body tissues, strength and digestive power, by making complications like headache, anorexia, dyspnoea, coma, dysentery, thirst and giddiness.

वातव्याधिरपस्मारी कुष्ठी रक्त्युदरी क्षयी ।। १०१ ।।
गुल्मी मेही च तान् क्षीरान् विकारेऽल्पेऽपि वर्जयेत् ।
(vātavyādhirapasmārī
kuṣṭhī raktyudarī kṣayī ।। 101 ।।
Gulmī mehī tān kṣīrān
vikāreऽlpeऽpi varjayet ।)

Physician has to reject the patients suffering from nervous diseases, epilepsy, dermatosis, haemopathy, ascites, tuberculosis, gulma and diabetes seen in a weak patient though the signs and symptoms are not in intensity.

Instant riṣṭa features

बलमांसक्षयस्तीव्रो रोगवृद्धिररोचक: ।। १०२ ।।
यस्यातुरस्य लक्ष्यन्ते त्रीन् पक्षान्न स जीवति ।
(balamāmsakṣayastīvro
rogavṛddhirarocaka: ।। 102 ।।
Yasyāturasya lakṣyante
trīn pakṣānna jīvati ।)

A patient, in whom severe loss of strength and muscle tone, increase of disease and anorexia are noticed, will not complete 3 fortnights (one and half months).

वाताष्ठीलाऽतिसंवृद्धा तिष्ठन्ती दारुणा हृदि ।। १०३ ।।
तृष्णया नु परीतस्य सद्यो मुष्णाति जीवितम् ।
(vātāṣṭhīlāऽtisamvṛddhā
tiṣṭhantī dāruṇā hṛdi ।। 103 ।।
tṛṣṇayā nu parītasya
sadyo muṣṇāti jīvitam ।)

The disease vātāṣṭhīla (enlargement of prostate gland due to vitiated vāta), positioned in the

upper body areas even up to the chest in its intense form, kills one who is afflicted with severe thirst.

शैथिल्यं पिण्डिके वायुर्नीत्वा तासां च जिह्मताम् १०४
क्षीणस्यायम्य मन्ये वा सद्यो मुष्णाति जीवितम् ।

(śaithilyam piṇḍike vāyur-
nītvā tāsām ca jihmatām ।। 104 ।।
Kṣīṇasyāyamya manye vā
sadyo muṣṇāti jīvitam ।)

Increased vāta, causing the calf muscles loose, the nose bent and manya veins in the sides of the neck contracted (especially of an emaciated), takes away one's life immediately.

नाभीगुदान्तरं गत्वा वङ्क्षणौ वा समाश्रयन् ।। १०५ ।।
गृहीत्वा पायुहृदये क्षीणदेहस्य वा बली ।
मलान् वस्तिशिरो नाभिं विबद्ध्य जनयन् रुजम् ।। १०६
कुर्वन् वङ्क्षणयोः शूलं तृष्णां भिन्नपुरीषताम् ।
श्वासं वा जनयन् वायुर्गृहीत्वा गुदवङ्क्षणम् ।। १०७ ।।

(nābhīgudāntaram gatvā
vaṅkṣaṇau vā samāśrayan ।। 105 ।।
Gṛhītvā pāyuhṛdaye
kṣīṇadehasya vā balī ।
malān vastiśiro nābhim
vibaddhya janayan rujam ।। 106 ।।
kurvan vaṅkṣaṇayoḥ śūlam
tṛṣṇām bhinnapurīṣatām ।
śvāsam vā janayan vāyur-
gṛhītvā gudavaṅkṣaṇam ।। 107 ।।)

Strongly vitiated vāta, being localised in between the umbilicus and anus, produced catching pain in the rectum and mediastinum very strongly (of a feeble patient), obstructed the bowel movements and the activities of urinary bladder as well as the prostate gland, caught the anus and groins, developed severe thirst, loose motion and dyspnoea, kills one immediately.

वितत्य पर्शुकाग्राणि गृहीत्वोरश्च मारुतः ।
स्तिमितस्याततताक्षस्य सद्यो मुष्णाति जीवितम् ।। १०८

(Vitatya parśukāgrāṇi
gṛhītvoraśca māruta: ।
stimitasyātatākṣasya
sadyo muṣṇāti jīvitam ।। 108 ।।)

Severely vitiated vāta, when attacked the chest region dilating the costal bone-ends, immobolised the whole body, and protruded the eyes out, kills one immediately.

सहसा ज्वरसन्तापस्तृष्णा मूर्च्छा बलक्षयः ।
विश्लेषणं च सन्धीनां मुमूर्षोरुपजायते ।। १०९ ।।

(Sahasā jvarasantāpa-
stṛṣṇā mūrcchā balakṣaya: ।
viśleṣaṇam ca sandhīnām
mumūrṣorupajāyate ।। 109 ।।)

Sudden onset of fever, thirst, stupor, loss of strength and looseness of joints are appeared together in a person who is nearing to death.

गोसर्गे वदनाद्यस्य स्वेदः प्रच्यवते भृशम् ।
लेपज्वरोपतप्तस्य दुर्लभं तस्य जीवितम् ।। ११० ।।

(Gosarge vadanādyasya
sveda: pracyavate bhṛśam ।
lepajvaropataptasya
durlabham tasya jīvitam ।। 110 ।।)

Severe sweating from the face of a patient afflicted with kaphajvara* in the morning is an indication of sudden death.

प्रवाळगुळिकाभासा यस्य गात्रे मसूरिकाः ।
उत्पद्याशु विनश्यन्ति न चिरात्स विनश्यति ।। १११ ।।

(Pravāḷaguḷikābhāsā
yasya gātre masūrikā: ।

*lepajvara is the word used here as this disease makes the patient feel as if the whole body applied with something.

utpadyāśu vinaśyanti
na cirātsa vinaśyati ।। 111 ।।)

The appearance and sudden disappearance of masūrika (chickenpox) as if beads of pearl are also indicative of imminent death.

मसूरविदळप्रख्यास्तथा विद्रुमसन्निभा: ।
अन्तर्वक्रा: किणाभाश्च विस्फोटा देहनाशना: ।। ११२

(Masūravidaḷaprakhyā-
stathā vidrumasannibhā: ।
antarvakrā: kiṇābhāśca
visphoṭā dehanāśanā: ।। 112 ।।)

Visphoṭaka (smallpox) that appears like the kernel of masūra (lentil), or the beads of coral with their openings turned towards inside, or like wart, causes death.

कामलाऽक्ष्णोर्मुखं पूर्णं शङ्खयोर्मुक्तमांसता ।
सन्त्रासश्चोष्णताऽङ्गे च यस्य तं परिवर्जयेत् ।। ११३ ।।

(Kāmalā'kṣṇormukham pūrṇam
śaṅkhayormuktamāmsatā ।
santrāsaścoṣṇatā'ṅge ca
yasya tam parivarjayet ।। 113 ।।)

A physician should avoid one who is having deep yellowish eyes, severely swollen face with loss of muscles in the temple region, consternation and warmth in the body.

अकस्मादनुधावच्च विघृष्टं त्वक्समाश्रयम् ।

(Akasmādanudhāvacca
vighṛṣṭam tvaksamāśrayam ।)

Same is the case of a patient whose skin abrasions spread suddenly all over the body.

यो वातजो न शूलाय स्यान्न दाहाय पित्तज: ।। ११४ ।।
कफजो न च पूयाय मर्मजश्च रुजे न य: ।
अचूर्णश्चूर्णकीर्णाभो यत्राकस्माच्च दृश्यते ।। ११५ ।।
रूपं शक्तिध्वजादीनां सर्वोस्तान्वर्जयेद्व्रणान् ।

(yo vātajo na śūlāya
syānna dāhāya pittaja: ।। 114 ।।
Kaphajo na ca pūyāya
marmajaśca ruje na ya: ।
acūrṇaścūrṇakīrṇābho
yatrākasmācca dṛśyate ।। 115 ।।
Rūpam śaktidhvajādīnām
sarvostānvarjayedvrṇān ।)

If a vātaja wound does not make śūla (pain), pittaja burning sensation, kaphaja pus and the wound located at the vital point does not create severe pain, are not to be treated. So also, a vraṇa (wound) is seen as if it is smeared with powder (though it is not so), or marked with certain shapes such as the shapes of arms and flags, is also to be discarded.

विण्मूत्रमारुतवहं कृमिणं च भगन्दरम् ।। ११६ ।।

(viṇmūtramārutavaham
kṛmiṇam ca bhagandaram ।। 116 ।।)

In the case of fistula in ano, which is oozing with faecal matter, urine, farting gas and worms, is to be avoided.

घट्टयन् जानुना जानु पादावुद्यम्य पातयन् ।
योऽपास्यति मुहुर्वक्त्रमातुरो न स जीवति ।। ११७ ।।

(Ghaṭṭayan jānunā jānu
pādāvudyamya pātayan ।
yo'pāsyati muhurvaktra-
māturo na sa jīvati ।। 117 ।।)

A patient, who thuds knees together, lifts both the legs and raps on the floor, turns face frequently, will not live long.

दन्तैश्छिन्दन्नखाग्राणि तैश्च केशांस्तृणानि च ।
भूमिं काष्ठेन विलिखन् लोष्टं लोष्टेन ताडयन् ।। ११८ ।।
हृष्टरोमा सान्द्रमूत्र: शुष्ककासी ज्वरी च य: ।
मुहुर्हसन् मुहु: क्ष्वेडन् शय्यां पादेन हन्ति य: ।। ११९ ।।
मुहुश्छिद्राणि विमृशन्नातुरो न स जीवति ।

(Dantaiścindannakhāgrāṇi
taiśca keśāmstṛṇāni ca ।
bhūmim kāṣṭhena vilikhan
loṣṭam loṣṭena tāḍayan ॥ 118 ॥
Hṛṣṭaromā sāndramūtra:
śuṣkakāsī jvarī ca ya: ।
muhurhasan muhu: kṣveḍan
śayyām pādena hanti ya: ॥ 119 ॥
Muhuśchidrāṇi vimṛśannā-
turo na sa jīvati ।)

One having frequent horripilation, viscous urine, dry cough and fever; if bites hair or grass, scratches the ground with twigs, hits clod with clod; laughs or mourns frequently, kicks bed with the leg, often examines the internal orifices (ears, nostrils, urethra, anal orifice, etc.), will not survive.

मृत्यवे सहसाऽऽर्तस्य तिलकव्यङ्गविप्लव: ॥ १२० ॥
मुखे, दन्तनखे पुष्पं, जठरे विविधा: सिरा: ।

(mṛtyave sahasāऽऽrtasya
tilakavyaṅgavipḷava: ॥ 120 ॥
mukhe, dantanakhe puṣpam,
jaṭhare vividhā: sirā: ।)

In a patient, sudden appearance of black moles (tilaka), black patches (vyaṅga) and rashes (vipḷu) in the face, flower-shaped fungal growths on the teeth and nails, different types of veins on the abdomen, are indications of death.

ऊर्ध्वश्वासं गतोष्माणं शूलोपहतवङ्क्षणम् ॥ १२१ ॥
शर्म चानधिगच्छन्तं बुद्धिमान् परिवर्जयेत् ।

(ūrdhvaśvāsam gatoṣmāṇam
śūlopahatavaṅkṣaṇam ॥ 121 ॥
śarma cānadhigacchantam
buddhimān parivarjayet ।)

An intelligent physician should avoid a moribund patient, who is losing body temperature, feeling pain in groins and getting no relief by any measures.

विकारा यस्य वर्धन्ते प्रकृति: परिहीयते ॥ १२२ ॥
सहसा सहसा तस्य मृत्युर्हरति जीवितम् ।

(vikārā yasya vardhante
prakṛti: parihīyate ॥ 122 ॥
sahasā sahasā tasya
mṛtyurharati jīvitam ।)

Death takes the life of a patient who shows sudden development in the symptoms and becomes weak.

यमुद्दिश्यातुरं वैद्य: सम्पादयितुमौषधम् ॥ १२३ ॥
यतमानो न शक्नोति दुर्लभं तस्य जीवितम् ।

(yamuddiśyāturam vaidya:
sampādayitumauṣadham ॥ 123 ॥
yatamāno na śaknoti
durlabham tasya jīvitam ।)

A patient, for whom if the physician, despite strenuous efforts, fails to prepare the medicine will not live long.

विज्ञातं बहुश: सिद्धं विधिवच्चावचारितम् ॥ १२४ ॥
न सिध्यत्यौषधं यस्य नास्ति तस्य चिकित्सितम् ।

(vijñātam bahuśa: siddham
vidhivaccāvacāritam ॥ 124 ॥
Na sidhyatyauṣadham yasya
nāsti tasya cikitsitam ।)

There is no treatment for one in whom if a medicine, which is already proven for its efficacy for many times, found ineffective; he needs no further treatment, means he will die.

भवेद्यस्यौषधेऽन्ने वा कल्प्यमाने विपर्यय: ॥ १२५ ॥
अकस्माद्वर्णगन्धादे: स्वस्थोऽपि न स जीवति ।

(bhavedyasyauṣadheऽnne
vā kalpyamāne viparyaya: ॥ 125 ॥

akasmādvarṇagandhāde:
svasthoऽpi na sa jīvati ।)

One, though healthy, if the medicine or food being prepared for him gets changed into opposite colour, smell and taste without any reason, is also an indication of death.

निवाते सेन्धनं यस्य ज्योतिश्चाप्युपशाम्यति ।। १२६ ।।
आतुरस्य गृहे यस्य भिद्यन्ते वा पतन्ति वा ।
अतिमात्रममत्राणि दुर्लभं तस्य जीवितम् ।। १२७ ।।

(nivāte sendhanam yasya
jyotiścāpyupaśāmyati ।। 126 ।।
Āturasya gṛhe yasya
bhidyante vā patanti vā ।
atimātramamatrāṇi
durlabham tasya jīvitam ।। 127 ।।)

In the house of a patient, if the fire in the lamp or hearth (even though there is sufficient fuel i.e. oil and wood respectively) gets extinguished in the absence of wind; and utensils break or fall unusually, are indications of his short life.

यं नरं सहसा रोगो दुर्बलं परिमुञ्चति ।
संशयप्राप्तमात्रेयो जीवितं तस्य मन्यते ।। १२८ ।।

(Yam naram sahasā rogo
durbalam parimuñcati ।
samśayaprāptamātreyo
jīvitam tasya manyate ।। 128 ।।)

Ātreya considers that a debilitated person, in whom the afflicted disease disappears suddenly, will die before long.

कथयेन्न च पृष्टोऽपि दु:श्रवं मरणं भिषक् ।
गतासोर्बन्धुमित्राणां न चेच्छेत्तं चिकित्सितुम् ।। १२९ ।।

(Kathayenna ca pṛṣṭoऽpi
du:śravam maraṇam bhiṣak ।
gatāsorbandhumitrāṇām
na cecchettam cikitsitum ।। 129 ।।)

A physician, even if forced, should not disclose the harrowing news of nearing death of a patient to his relatives, but show his dislike to treat the patient.

यमदूतपिशाचाद्यैर्यत्परासुरुपास्यते ।
घ्नद्भिरौषधवीर्याणि तस्मात्तं परिवर्जयेत् ।। १३० ।।

(Yamadūtapiśācādyair-
yatparāsurupāsyate ।
ghnadbhirauṣadhavīryāṇi
tasmāttam parivarjayet ।। 130 ।।)

It is better to avoid those patients who are obsessed with evil sprits like goblins and messengers of yama (God of death) as they cause to destroy the potency of medicines.

आयुर्वेदफलं कृत्स्नं यदायुर्ज्ञे प्रतिष्ठितम् ।
रिष्टज्ञानादृतस्तस्मात्सर्वदैव भवेद्भिषक् ।। १३१ ।।

(Āyurvedaphalam kṛtsnam
yadāyurjñe pratiṣṭhitam ।
riṣṭajñānādṛtastasmāt-
sarvadaiva bhavedbhiṣak ।। 131 ।।)

Upon what ground the complete efficacy of ayurveda i.e. effectiveness of the treatment is pivoted on a physician who discerns the life with its pattern of preservation, on the same ground, he must always be careful to distinguish different riṣṭams without any mistake; in other words, he should start the treatment knowing the life-span of a patient.

मरणं प्राणिनां दृष्टमायु:पुण्योभयक्षयात् ।
तयोरप्यक्षयाद्दृष्टं विषमापरिहारिणाम् ।। १३२ ।।

(Maraṇam prāṇinām dṛṣṭa-
māyu:puṇyobhayakṣayāt ।
tayorapyakṣayāddṛṣṭam
viṣamāparihāriṇām ।। 132 ।।)

It is understood that death occurs for the living

beings on expiry of lifespan and virtue or both together. Without the expiry of these two, death also occurs to certain people who do not care the risk deeds like confront with ferocious animals, whirlpool, etc.

इति श्रीवैद्यपतिसिंहगुप्तसूनुश्रीमद्वाग्भटविरचिता-
यामष्टाङ्गहृदयसंहितायां द्वितीये शारीरस्थाने वि-
कृतिविज्ञानीयो नाम पञ्चमोऽध्याय: ।। ५ ।।

(iti śrīvaidyapatisimhaguptasūnuśrīmadvāg-bhaṭaviracitāyāmaṣṭāṅgahṛdayasamhitāyām dvitīye śārīrasthāne vikṛtivijñānīyo nāma pañcamoऽdhyāya: ।। 5 ।।)

Thus ends the 5th chapter titled Vikṛtivijñānīyam of Śarīrasthāna of Aṣṭāṅgahṛdayasamhitā, composed by Vāghbaṭa, the son of Vaidyapati Simhagupta.

STATEMENT ABOUT OWNERSHIP AND OTHER PARTICULARS ABOUT NEWSPAPERS

(Aryavaidyan - Form II vide Rule 3)

1. Place of Publication	:	Kottakkal
2. Periodicity of its Publication	:	Quarterly: 4 times a year
3. Printer's name	:	P.K. Warrier
Nationality	:	Indian
Address	:	Managing Trustee, Arya Vaidya Sala, Kottakkal-676 503, Malappuram Dist., Kerala State. (Printed at Radhakrishna Press, Kottakkal)
4. Publisher's name	:	P.K. Warrier
Nationality	:	Indian
Address	:	Managing Trustee, Arya Vaidya Sala, Kottakkal-676 503, Malappuram Dist., Kerala State.
5. Editor's name	:	Dr. M.R. Raghava Varier
Nationality	:	Indian
Address	:	Publication Division, Arya Vaidya Sala, Kottakkal-676 503, Malappuram Dist., Kerala State.
6. Name and address of individuals who own the Newspaper and Partners or Shareholders, holding more than 1% of the total Capital.	:	Arya Vaidya Sala, Kottakkal. (A Charitable Trust).

I, P.K. Warrier hereby declare that the particulars given above are true to the best of my knowledge and belief.

Sd/-
P.K.WARRIER
Publisher

Kottakkal
15 - 2 - 2008

Aryavaidyan Vol. XXI., No. 3, Feb. - Apr. 2008, Pages 141 - 147

PHARMACOGNOSTICAL EVALUATION OF *WEDELIA BIFLORA* DC.

S. Sureshkumar[1] *et al.*[*]

Abstract: *Wedelia biflora* DC., belonging to the family Asteraceae, is a perennial, climbing shrub. The plant finds use in traditional systems of medicine in the management of ulcers, sores and has purgative and diuretic properties; leaves and stems are said to be toxic to goats; the aqueous extract of the leaves and stem is toxic American cockroaches. This paper deals with the pharmacognostical studies carried out on the leaf, stem and roots of *Wedelia biflora* for identification of the plant from other related species of *Wedelia.*

Introduction

The dried and fresh leaf are used to relive headache and used as diuretic and laxatives[1]. The fresh leaf is effectively used in the treatment of malarial fever, which is taken orally along with lime and sea-water.[2] Fresh leaf juice is used to treat tropical sores, wounds, scabies and cuts. The fresh leaves were effectively used in the treatment of diarrhoea and dysentery[3].

Cooked young leaves are consumed in small quantities as a flavoring with food. The pounded leaves are used for preparing a poultice for cuts, ulcers, sores, and varicose veins. A decoction of the roots and leaves is prescribed for stomachache. The leaves are also credited with diuretic properties[4]. The flowers are violently purgative. The leaves contain a fair amount of protein, but have a high content of fiber. They also contain alkaloids[5].

Macroscopic characters

A rambling, perennial, climbing shrub, found near the eastern and western sea coasts and in the Andaman's. Stems semi-woody below; leaves ovate, serrate; heads1-3 peduncled, yellow, 1.25-1.90 cm. diam.; achens shortly cuneate, 3-4 angled.

Materials and methods

The plant *Wedelia biflora* (Asteraceae) is found abundantly in the various parts of Andaman Nicobar Island. For the present study, the entire plant was collected from Andaman Nicobar Islands in the month of August 2002 and was authenticated by Dr. P. Jayaraman, Director, Medicinal Plant Research Unit and Plant Anatomy Research Centre, Chennai, India.

Histological characters

For the study of histological characters, sodium hydroxide (5%) solution was used for clearing

*R. Sampath Kumar[1], T. Sivakumar[2], S.P.Dhanabal[3], M.J.N. Chandrasekar[3] and B. Suresh[3].

1. *JKK. Nataraja College of Pharmacy, Komarapalayam, Tamil Nadu-638 183*; 2. *Nandha College of Pharmacy, Erode, Tamil Nadu-638152*; 3. *J.S.S. College of Pharmacy, Ooty-643 001*

the lamina and epidermal peeling by partial maceration employing Jeffrey's maceration fluid was prepared. Glycerin mounted temporary preparations were made for macerated/cleared materials.

Sectioning

The paraffin embedded specimens were sectioned with the help of Rotary Microtome. The thickness of the section was 10-12 ì m. De waxing of the sections was by customary procedure. The sections were stained with Toluidine blue[6]. Since Toluidine blue is a polychromatic stain, the staining results were remarkably good, and some cytochemical reactions were also obtained. The dye rendered pink colour to the cellulose walls, blue to the lignified cells, dark green to suberin, violet to the mucilage, blue to the protein bodies, etc. Section was also stained with safranin and Fast-green and IKI (for starch) wherever necessary.

For studying the stomatal morphology, veination pattern and trichome distribution, paradermal sections (section taken parallel to the surface of leaf) as well as clearing of leaf with 5% sodium hydroxide or epidermal peeling partial maceration employing Jeffrey's maceration fluid[7] were prepared. Glycerin mounted temporary preparations were made for macerated/cleared materials[8,9].

Photomicrographs

Microscopic descriptions of tissue have supplemented with micrographs wherever necessary. Photographs of different magnification were taken with Nikon-Labphot 2 microscopic unit. Bright field was used for normal observations. Polarized light was employed for the study of crystals, starch grains and lignified cells. Since these structures have birefringent property, under polarized light they appear bright against dark background. Magnifications of the figures are indicated by the scale-bars[6,7].

Transverse section - leaf

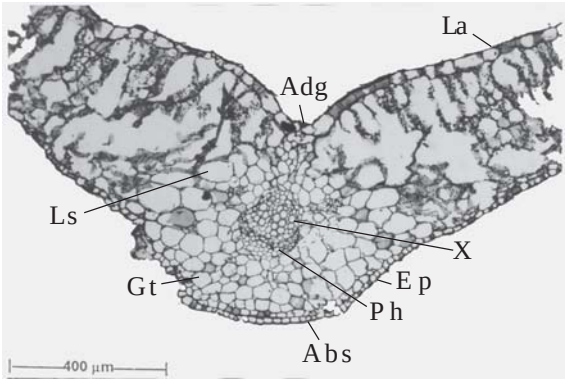
The midrib has a deep groove on the adaxial side and broadly hemispherical body on the abaxial side. The midrib is 425-500 µm in vertical plane and 400-500 µm in transverse plane. It has a top shaped vascular bundle with two small lateral strands on the adaxial part. The top shaped vascular bundle consists of short vertical files of xylem elements on the adaxial side and a thin band of phloem on the abaxial side surrounding the metaxylem. Lateral strands consist of a few vascular elements. The ground tissue can be differentiated into outer 2 to 3 layers of collenchyma cells and rest of the ground tissue is parenchymatous, compact and the cells are circular or polygonal in shape. The epidermal layer on the abaxial part is thin with distinct squarish cells. (Fig-I. a&b)

Venation pattern

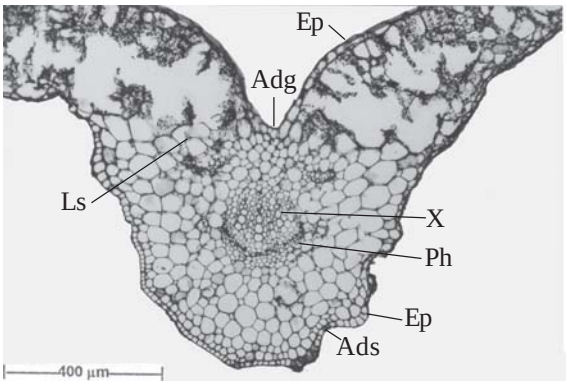
The lamina is cleared and made transparent to show their reticulation of lateral veins. The vein lets form wide rectangular or poly hedral vein islets. The vein terminations are thin, long and branched. They are unbranched or more commonly forked once or twice (Fig-II. a&b).

Epidermal tissue

On the adaxial surface of the lamina abundant epidermal trichomes are seen. The trichomes are 2 or 3 celled, unbranched, thin walled and pointed. Rosettes of epidermal cells surround the base of the trichome. Some of the trichomes have single dilated basal cell. The abaxial epidermal cells are polyhedral and thick walled. The cell walls are straight and cuticular striations not evident. Stomata are paracytic or anisocytic.



a

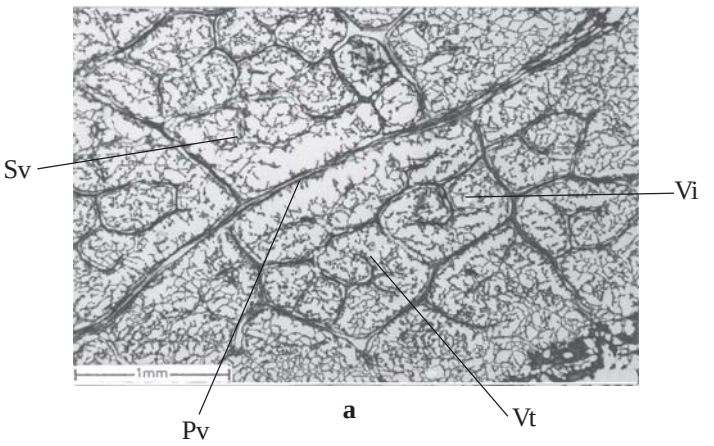


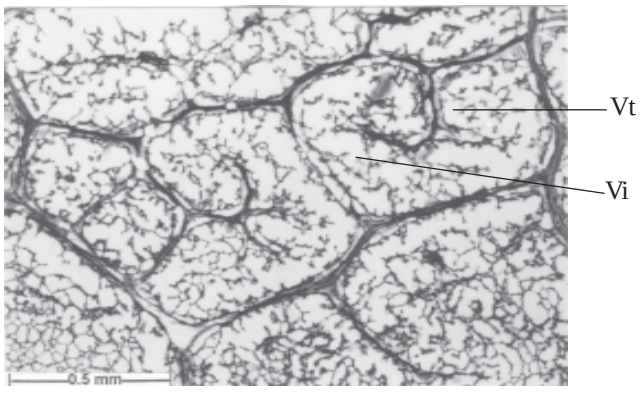
b

Fig. I a&b - *Wedelia biflora* DC. - Microscopic characters of leaf

a T.S of lateral midrib with lamina; **b** T.S of median midrib with lamina

Abs Abaxial side; **Adg** Adaxial side; **Ep** Epidermis; **Gt** Ground tissue; **Ls** Lateral strand; **Ph** Phloem; **X** Xylem





b

Fig.II a&b - *Wedelia biflora* DC. - Venation pattern

a Vein-islets and Vein termination under low magnification

b Vein-islets and Vein termination - enlarged

Pv Primary vein; **Sv** Secondary vein; **Vi** Vein-islets; **Vt** Vein-termination

The number of stomata is 24 per field area. The guard cells are elliptic with polar nodules (Fig. III a-d)

Transverse section - stem

Stems of various thicknesses were studied. The stem is circular in cross section. No periderm is formed. Epidermis is thin and unistratose; the epidermal cells are cubical and intact. The epidermis is followed by 4 or 5 layers of compact, angular collenchyma cells and rest of the cortical cells are thin walled parenchyma cells. Mucilage and secretary cavities are abundant in the cortical region. In young stem the secondary xylem occurs as a continuous cylinder. Xylem vessels and xylem fibers are well developed in the fasicular region while in the interfasicular region, vessels are scanty and xylem fibers are more. The secondary xylem consists of vessels, xylem fibers and thin radial lines of xylem rays; xylem vessels are thin walled and solitary with 30-60 µm in diameter; fibers are thick walled and lignified; primary xylem elements occurs in radial rows around the pith. Pith is parenchymatous and thin walled. The structure of old stem is similar to the young stem. The cortex has wide, irregular air chambers, secondary xylem has more number of vessels which are angular, thin walled and occurs in tangential multiples.

Transverse section - root

Roots of varying thickness were studied. The root is normal in its secondary growth. The outer part of the root has a thin, less distinct rhizodermis followed by one or two layers of sub rizodermal layers. Major portion of the cortex is arenchymatous. It comprises of wide, oblong air-chambers, divided by radially running, uniseriate, branched partitions. The inner cortex is a narrow zone of 2 or 3 layers of compact cells unsheathing the stele. Secondary xylem is in the form of dense with uneven surface, compact and cylindrical. The primary xylem occupies the centre of secondary xylem cylinder. Secondary xylem comprises of vessels, fibres and xylem rays. Xylem vessels are mostly solitary or occasionally in radical radial multiples. The vessels are wide circular and thick walled. Xylem fibres are thick walled lignified and narrow lumened. Secondary phloem surrounds the xylem cylinder. The vessel diameter ranges from 20- 60 µm.

Physico-chemical constants

Ash values

The ash values are helpful in determining the quality and purity of crude drugs in the powder form according to the standard procedure[8-11], viz. total ash (83.3%), acid in soluble ash (87.57%), water soluble ash (88.30%) and sulphated ash (74.10%).

Extractive values

The amount of extractive drug yield to a given solvent is often an approximate measure of a certain constituent or group of related constituents the drug contains. In some cases the amount of drug soluble in a given solvent is an index of its purity. The solvent used for extraction should be in a position to dissolve appreciable quantities of the presence of substances desired[10-13].

The extractive values of crude drugs are useful for their evaluation especially when the constituents of a drug cannot be readily estimated by any other means. Further, these values indicate the nature of the constituents present in a crude drug. 95% ethanolic soluble extractive values were determined and found to be 20.01% w/w and 11.06% w/w respectively.

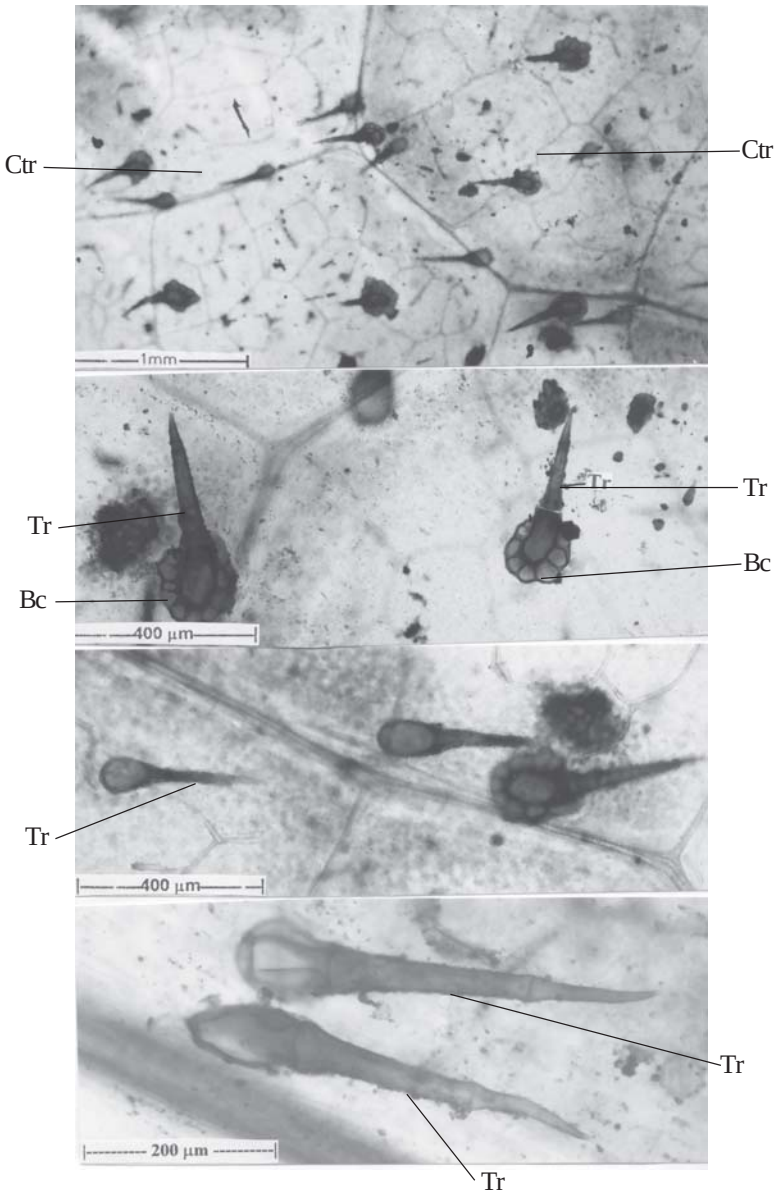


Fig.III - Trichome Morphology

Two types of trichomes. Some present rosette type of basal cells, some without rosette basal cells.

Bc Basal cells; **Ctr** Covering trichomes; **Tr** Trichome

Acknowledgement

The authors are thankful to the secretary and correspondent Smt. N. Sendamaraai, J.K.K. Rangammal Charitable Trust and Dr. P. Perumal, Principal, J.K.K. Nataraja College of Pharmacy, Komarapalayam, for the support rendered.

References

1. Dagar, H.S. and Daggar, J.C., Ethano-botanical observations among the onge tribe of little Andaman Bull Med *Ethnobot Res.*, 10 ; pp 1-10, 1987.
2. Holdsworth, D., Traditional Medicinal Plants used in the treatment of malaria and fevers in Papua New Guinea, *Papua New Guinea Med. J.*, 18, pp 142-148, 1975.
3. Holdsworth, D., Phytomedicine of the Madang Province Papua New Guinea Part I Karkar Island, *Int. J. Crude Drugs Re*, 22(3); pp 111-119, 1984.
4. Chopra, R.N., Nayar, R.N. and Chopra, I.C., *Glossary of Indian Medicinal Plants*, C.S.I.R, New Delhi, P 687, 1992.
5. Anonymous, *Wealth of India-Raw materials*, Publication and Information Directorate, Vol. X, C.S.I.R, New Delhi, pp 567-568, 1998.
6. O'Brien, T.P., Feder, N. and Mc Cull, M.E., Polychromatic Staining of Plant Cell walls by toluidine blue-o, *Protoplasma*, 59; pp 364-373, 1964.
7. Sass, J.E., *Elements of Botanical Microtechnique*, Mc Graw Hill Book Co, New York, P 222, 1940.
8. Johnson, D.A., *Plant Microtechnique*, Mc Graw Hill Book Co, New York, P 523, 1940.
9. Metcalfe, C.R. and Chalk, *Anatomy of the Dicotyledons*, Clarendon Press, Oxford, Vol. I., P 276, 1979.
10. Trease, G.E. and Evans, W.C., *Pharmacognosy*, Bailliere Tindall, London, 12th Edn., P 241, 1983.
11. Khandelwal, K.R., Pawar, A.P., Kokate, C.K. and Gokhale, S.B., *Practical Pharmacognosy*, Nirali Prakasam, Pune, pp 140-141,1995.
12. Mukherjee, P.K., Quality Control of Herbal drugs, *Business Horizons*, New Delhi, pp 187-191, 2002.
13. Anonymous, *Indian Pharmacopoeia*, Ministry of Health and Family Welfare, Govt. of India, Controller of Publications, New Delhi, Vol. II., A pp 53-54, 1996.

Aryavaidyan Vol. XXI., No. 3, Feb. - Apr. 2008, Pages 148 - 151

IMMUNOMODULATORY STUDY OF ĀRAGVADHA (*CASSIA FISTULA* LINN.) ON VICARCCIKA (ECZEMA)

Sanjita Das[1], P. K. Sarkar[2], A. Sengupta[1] and A. Chattopadhyay[1]

Abstract: Vicarccika (eczema) is a chronic skin disease with no permanent cure in modern medicine. Raised serum IgE level is the commonest immunological marker for eczema. Āragvadha (*Cassia fistula*) is a well known, commonly used plant in various skin disorders in āyurvedic system of medicine. It is considered to having kaṇḍughna and kuṣṭhaghna properties. In this study, phalamajja (fruit pulp) of āragvadha was evaluated for its immunomodulatory activity on the patients of eczema. The results of this study are suggestive of significant immunomodulatory activity of āragvadha.

Introduction

Āragvadha (*Cassia fistula*) is a moderate sized deciduous tree, indigenous to India. It is sometimes cultivated for its beautiful yellow flowers. Its medicinal properties are recognized in āyurvedic system of medicine. The herb āragvadha is first mentioned in Carakasamhita, and its action as kuṣṭhaghna and kaṇḍughna is also firstly mentioned in the same classic[1].

Several skin disorders have been mentioned in āyurvedic classics termed as kuṣṭha, with specific clinical features, etiology, pathogenesis and treatment. Vicarccika is one of the skin disorders categorized under kṣudra kuṣṭha[2]. Though, this is not life threatening, its appearance, nature of severe itching and chronicity hamper normal routine of life. Vicarccika resembles eczema of modern medical science. A genetic predisposition and raised serum IgE level is very common in eczema. The clinical condition of eczema is chronic and desensitization, which is called as latest treatment is not effective in chronic cases[3]. So, it is very essential to search for a proper medicine.

As serum IgE level is the commonest immunological marker of eczema, evaluation of immunomodulatory effect of āragvadha was assessed through serum IgE level[4]. In the present study, a comparative clinical trial of phalamajja cūrṇa (fruit pulp powder) and lepa (paste) of āragvadha was carried out for evaluating its immunomodulatory activity on the patients of eczema.

Materials and methods

Patients**: -** Patients attending O.P.D. of I.P.G.A.E. & R. at S.V.S.P. Hospital, Kolkata having classical symptomatolgy of eczema were selected and

1. *I.P.G. A. E. & R. at S.V.S.P. Hospital, 294/3/1, APC Road, Kolkata: 700009*
2. *I.P.G.T. &R.A., Gujarat University University, Jamnagar: 3610083*

registered irrespective of their age, sex and religion.

Inclusion criterion:- Patients of both discharging and non-discharging lesion along with specific symptomatolgy of eczema were selected for the present clinical trial. Raised serum IgE level (Table 1) was taken as the prime inclusion criteria. A detailed history was taken and complete physical examination was also carried out.

Exclusion criterion: - Patients of other skin disorders (like dadru, pama, etc.) and other systemic diseases were excluded. Patients of eczema having normal serum IgE level were also not included in the present clinical trial.

Assessment criterion:- Improvement in the serum IgE level after treatment was taken as assessment criteria.

Detection of serum IgE level:- Blood sample was taken from patients before commencement and after completion of treatment. Serum was separated from blood, and IgE level was estimated by ELISA method.

Posology

Drug**:** Āragvadha phalamajja in cūrṇa and lepa forms was given to the patient for internal administration and external application respectively.

Dose and duration: Āragvadha phalamajja cūrṇa was prescribed in 5g/day dose, and Āragvadha phalamajja lepa was given for local application as necessary. The treatment schedule was continued for 60 days. All the patients were reviewed after each 7 days for a period of 30 days.

Direction and diet: The drug for internal administration was prescribed to be taken at night an hour after dinner. Patients were advised to avoid pulses, egg, meat, sour and junky foods.

TABLE 1

Normal serum IgE level in different age groups

Group	Age (year)	Serum IgE level
Infant	Up to 1	>15 IU/ml
Children	1 - 5	>60 IU/ml
Children	6 - 9	>90 IU/ml
Children	10 - 15	>100 IU/ml
Adult	16 and above	>100 IU/ml

Study protocol

Total 60 patients were registered for the clinical trial and divided randomly in 3 groups, containing 20 patients in each group. Patients of group-A were treated with Āragvadha phalamajja cūrṇa in 5g/day dose. Patients of group-B were treated with Āragvadha phalamajja lepa for local application. And Patients of group-C were treated with Āragvadha phalamajja cūrṇa in 5g/day dose orally and Āragvadha phalamajja lepa for local application. Any unwanted effect of the drugs during the total period of treatment schedule was noted.

Statistical analysis

The obtained data were analyzed statistically and presented as mean ± SEM (standard error of mean). The observed difference was calculated by adopting student 't' test and Anova. $P<0.05$ was considered as statistically significant and $P<0.001$ and $P<0.01$ were considered as statistically highly significant.

Results

Among the 20 registered patients in each group, 17 patients of group-A, 15 patients of group-B and 18 patients of group-C completed the treatment schedule.

Symptomatic relief was found in all the patients

of treated group. Maximum improvement in general symptoms and signs was observed in patients of group-C i.e. Āragvadha phalamajja cūrna and lepa treated group, followed by patients of internal administration i.e. Āragvadha phalamajja cūrṇa treated group. On symptom of piṭika, the improvement was high in group-B i.e. Āragvadha phalamajja lepa treated group.

Pre and post treated serum IgE level was estimated (Tabled 2). Statistically highly significant (P<0.001) decrease in serum IgE level was observed in all the treated groups. But the decrease in serum IgE level was found to be maximum in patients of group-C i.e. Āragvadha phalamajja cūrṇa and lepa treated group. Here Dunnet's 't' test was adopted to determine the effect of test drugs of group-A and group-C against test drug of group-B (because this group showed least result). It showed test drug of group-C has more significant (P<0.001) effect than test drug of group-A (P>0.1).

TABLE 2

Effect of therapy on serum IgE level

Group	Dose (g/day)	Serum IgE level (IU/ml)		
		BT	AT	Improvement (%)
A	5	216.0 ± 17.5	186.2 ± 11.8	14.0*
B	QS	199.6 ± 13.1	178.0 ± 10.4	10.6**
C	5 + QS	270.6 ± 51.5	183.1 ± 43.3	32.3##

Mean ± SEM; AT= After treatment, BT= Before treatment; A= Treated by Āragvadha Phalamajja Cūrṇa; 17 patients in the group; B= Treated by Āragvadha Phalamajja Lepa, 15 patients in the group;
C= Treated by Āragvadha Phalamajja Cūrṇa + Lepa, 18 patients in the group; QS= Quantity sufficient; * p<0.01; **p<0.001 (paired student 't' test); ##p<0.001 (Dunnet's 't' test)

Discussion

The most consistent immunological finding of eczema is raised serum IgE level. Raised serum IgE level is found due to defect in the control of IgE production by T-lymphocytes. Abnormalities also present in T-lymphocytes in the form of decreased number of circulating T-lymphocytes, especially suppressor T-lymphocyte associated with a decrease in T cell activity[5]. In the present clinical trial, serum IgE level was considered as the prime factor for the selection and assessment of the immunomodularory activity of āragvadha.

Internal administration of cūrṇa of āragvadha causes antarparimārjana (internal purification) and external application of lepa causes bahirparimārjana (external purification). According to ancient classics of āyurveda, āragvadha is the best bahirparimārjanīya lepa for kuṣṭha and it is a specific drug of śleṣmasamśamana-varga (kapha-reducing group), virecana-dravya-vikalpa (purgative group) and adhobhāgahara (through rectal passage elimination) dravya and phalinī (fruit bearing) plant[6].

The results seen in the general signs and symptoms, revealed that due to virecana (purgative) effect of āragvadha, it directly encounters kuṣṭha especially vicarccika. Though vicarccika is a disease caused by aggravation of pitta and kapha, pitta-virecana is the choice of therapy, whereas kapha predominance is mitigated by the tiktarasa (bitter taste) of āragvadha, along with its purgative activity. By these activities of āragvadha, the features like kaṇḍu (itching), srava (discharge), etc. is relieved. Madhurarasa (sweet taste) and snigdhaguṇa (oleaginous property) of the fruit-pulp of āragvadha mitigate vitiated pitta and

vāta. Vātaja symptoms like rāji (lichenification), rūkṣata (roughness), ruja (pain), śyāvavarṇata (bluish-black discolouration) and pittaja symptoms like dāha (burning sensation) are normalised in this way.

The fruit-pulp contains oxy-methyl anthraquinone, proantthrocyanidin, 1,8-dihydroxy-3-methyl anthraquinone dihydrokaempferol, kaemplerof, (-) epiafzelechin, (+) catechin, anodyne, cooling-emoliant substances, arginine, reucine, methionine,phenylalanine, tryptophan, aspartic and glutamic acid, etc. Beside these, it also contains astringent matter, sugar, gum, gluten, colouring agent and water[7].

Astringent substances precipitate surface proteins and promote suppression of oozing. 1,8-dihydroxy-3-methyl anthranol is a keratoplastic agent, which reverse abnormal keratinization process to normalcy. Hydroquinone by its antityrosinase activity and toxic effect to melanocytes causes deipigmentation seems as effective for discolouration. Catchin, emodin and cooling agents decrease pruritus and burning sensation by cooling evaporation and antipruritic activity[8]. And all the active principles collectively may exert the significant immunomodulatory activity.

Conclusion

Analysis of the data of the immunomodulatory study reveals āragvadha has significant immunomodulatory activity. It may also be concluded that its fruit-pulp provides a healthy achievement in immunomodulatory therapy for skin disorders in general and vicarccika (eczema) in particular. It seems to possess significant anti-inflammatory, analgesic, anti-pruritic and immunomodulatory activity.

References

1. Agnivesa, *Caraka Samhita*, Sharma R.K., Dash B. English translation, Vol. I, 7th Edn., Chaukhamba Sanskrit Series Office, Varanasi, 2001.
2. Ibid - Vol. III.
3. Khanna, N., *Dermatology and Sexually Transmitted Diseases*, 1st Edn., Modern Publishers, Calcutta, 2002.
4. Bhel, P.N., *Practice of Dermatology*, CBS Publishers and Distributors, 7th Edn, New Delhi, 1990.
5. Gyton, C., *Textbook of Medical Physiology*, 8th Edn., Prism Book Pvt. Ltd., Bangalore, 1991.
6. Agnivesa, *Caraka Samhita*, Sharma R.K., Dash B. English translation, Vol. VI, 7th Edn., Chaukhamba Sanskrit Series Office, Varanasi, 2001.
7. Kirtikar, K.R. and Basu, B.K., *Indian Medicinal Plants*, 1st Edn., Yayyed Press, Delhi.
8. Rastogi, R.P., Malhotra B.N., *Compendium of Indian Medicinal Plants*, 1st Edn., Publication and Information Directorate, New Delhi, 1998.

Aryavaidyan Vol. XXI., No. 3, Feb. - Apr. 2008, Pages 152 - 159

EFFECT OF SIMHANĀDAGUGGULU AND PUNARNAVĀRIṢṬA IN TAMAKAŚVĀSA

Parameshwarappa, S. Byadgi and Akash Chandra Tripathi*

Abstract : According to āyurveda, tamakaśvāsa (bronchial asthma) is due to exposure to dust, pollens, fog or cold-weather characterised by chest-tightness, wheeze and cough. In this, mainly vāta and kapha are involved along with rasadhātu. This paper evaluates the efficacy of two āyurvedic formulations viz. Simhanādaguggulu and Punarnavāriṣṭa in the management of tamakaśvāsa.

Introduction

According to the concept diseases of nose and sinuses, can cause disease at alveolar level and alveoli can affect nose and sinus. This indicates there is close and constant association of allergic rhinitis and bronchial asthma[1.] Bronchial asthma is a disease of airways characterised by increased responsiveness of the tracheobronchial tree and a variety of stimuli resulting in widespread spasmodic narrowing of the air passage which may be relieved spontaneously or by therapy[2]. Bronchial asthma and tamakaśvāsa[3] are the two different terms used by allopathy and āyurveda respectively, which seem to be similar in terms of their etiopathology, symptomatology, prognosis and treatment. Despite of so much advancement in this area, this disease is a challenging entity to both the systems of medicine. Around 100-150 million people around global, roughly equivalent of the population of the Russian federation, suffer from asthma. Every year 180,000 death occurs in India and about 15-20 million population and 10-15% children under the age of 5-11 year are suffering from asthma[4]. Āyurveda, by its holistic approach, aims at the well being of the patient by eradicating the causative factors without damaging the vital body structures. With this background, patients were selected for the clinical trial to evaluate the efficacy of Simhanādaguggulu and Punarnavāriṣṭa in one group and Simhanāda guggulu and Punarnavāriṣṭa along with kuñjalkarma (a procedure described in Gheraṇḍa Samhita for purification of āmāśaya) and prāṇāyāma in another group. Punarnavāriṣṭa is

*Department of Vikriti Vigyan, Faculty of Ayurveda, Institute of Medical Sciences, Banarus Hindu University, Varanasi - 221 005 UP.

referred to in Bhaiṣajyaratnāvali for the management of śoṭha (oedematous disorders), kāsa (cough), śvāsa (bronchial asthma) and kaṇḍu (itching)[5]. Simhanādaguggulu is indicated in kāsa, śvāsa and viṣamajvara (intermittent fever)[6]. Kuñjalkarma is indicated as kāsaghna, śvāsaghna and kapharogaghna[7]. Prāṇāyāma is indicated in all types of disorders especially respiratory system to improve and vitalize the system concerned[8]; hence it was selected in one group along with āyurvedic medication, and kuñjalkarma and prāṇāyāma included to prove the efficacy of the same in comparison to āyurvedic drugs.

Materials and methods

The study was designed in two groups i.e. Group A - Simhanādaguggulu and Punarnavāriṣṭa only and Group B - Simhanāda guggulu and Punarnavāriṣṭa along with kuñjalkarma and prāṇāyāma.

The place of the study was at Sir Sunderlal Hospital, Indian Medicine Wing, I.M.S., B.H.U., Varanasi. The study was conducted on 36 patients selected from the KC OPD of the same Hospital.

Inclusion criteria

- Age group: 10-70 years
- Duration of disease: From first diagnosis to chronic disease (up to 30 yrs)
- Sex: Both sexes.
- Patients with wheezing, cough, dyspnoea and chest tightness with or without history of asthma and history of recurrent episodes of bronchial asthma.

Exclusion criteria

Patients of chronic obstructive pulmonary diseases, bronchial carcinoma, cardiac asthma, congenital chest abnormality, diabetes mellitus and status asthmaticus pediatric asthma were excluded.

Grading criteria

	Grade
A. Subjective parameters:	
1. Dyspnoea	
- On more than accustomed work	1
- On accustomed work	2
- While doing less than accustomed work	3
- On rest	4
2. Cough (on the basis of frequency of cough in 24 hrs associated with exhaustion)	
- No cough	0
- Cough 0-5 times in 24 hrs without exhaustion	1
- Frequency of cough 5-10 times in 24 hrs. with or without exhaustion	2
- Frequency more than 10 times on 24 hrs with exhaustion	3
3. Wheeze (as per patients opinion in day and night time)	
- No wheezing	0
- 1 or 2 per day in day time	1
- During day and night	2
- Throughout day and night	3
4. Asthmatic attack	
- Once in 1 to 2 years	1
- 6 month to 1 year	2
- 0-6 months	3
B. Objective parameters:	
- Absolute eosinophill count	
- Auscultatory finding	
- Respiratory rate	
- Improvement in well being	
- Spirometric finding	

Drug administration

Simhanādaguggulu (800 mg) with Punarnavāriṣṭa (20 ml) was administered orally twice daily i.e. in the morning and evening in Groups A & B. Kuñjalkarma and prāṇāyāma were also advised to perform in the morning in the Group B patients.

Observation

The study was done on 36 patients. The demographic profiles such as incidence of age and sex (Table 1), educational status, dietary habit, etc.(Table 2a&b) were recorded.

Results and discussion

The main contributory factor involved in the development of tamakaśvāsa comprises of vāta, kapha, pitta, rasadhātu in a successive order. Prāṇavahasrotas (respiratory system) is one of the chief systems involved in the genesis of disease wherein all the factors, which are responsible for the development of disease, conglomerate and produce abnormality and manifest the disease tamakaśvāsa. It is also described that pittasthāna is the root for the initiation of disease process. Kapha here comes out from prāṇavahasrotas (respiratory tract) in the form of rasadhātu-mala (abnormal sputum/ mucous). Āma (free radicals) develops due to ill-functioning of both jaṭharāgni and rasadhātvagni. Āma acts as a foreign body and initiates reaction along the prāṇavahasrotas resulting into the attack of bronchial asthma. Kapha is the main factor for the maintenance of vyādhikṣamatva (immunity power). Vāta is the controller of all kinds of activities, which is aggravated in the prāṇavahasrotas due to blockage of its own path by malarūpi kapha. This leads to exacerbation of vāta and stimulates the prāṇavahasrotas along with āmaviṣa and manifest life threatening disorder - tamakaśvāsa. Āmaviṣa is a condition, which manifest due to remnants of āma in the gastro-intestinal tract for longer duration and liberates certain toxin-like materials, which act as allergic to prāṇavahasrotas and manifest allergic reactions in the form of dysponea, wheeze, chest tightness, etc. Until today, this disease is challenging in terms of its management due to change in life style, stress, pollution, etc.

TABLE 1
Demographic profile - Inidence of age & sex

Years	Male		Female		Total		Total	
	Gr. A	Gr. B	Gr. A	Gr. B	Gr. A	Gr. B	No	%
0-10	0	0	0	0	0	0	0	0
11-20	2	2	0	0	2	2	4	11
21-30	4	6	3	3	7	9	16	44
31-40	4	2	0	0	4	2	6	16.6
41-50	1	1	0	0	1	1	2	5.5
51-60	2	2	1	1	3	3	6	16.6
61-70	1	1	0	0	1	1	2	5.5
Total	14	14	4	4	18	18	36	100

Simhanādaguggulu contains guggulu, triphalā, trikaṭu, sarṣapa and eraṇḍa, and is indicated in the management of kāsa, śvāsa, viṣamajvara and āmavāta. The ingredients are having vāta and kapha pacification nature, which is the basic line of treatment advocated for the management of tamakaśvāsa. It also contains ingredients which facilitates proper bowel movements that prevents stagnation of āma and corrects pitta functions so that udbhava-sthāna (inception point) i.e. pittasthāna of tamakaśvāsa is corrected. That is why this drug is more helpful to eradicate and expel mala i.e. rasadhātu-malarūpi-kapha from the prāṇavaha-srotas, resulting into pacification of symptoms followed by nullification of adverse effects of rasadhātu-malarūpi-kapha, because functions of rasadhātu are corrected by drugs. As a result, no formation of rasadhātu-malarūpi-kapha exists. This resulted in reduction of symptomatology.

TABLE 2a
Demographic profiles - Educational status, habitat, dietary habit, occupation and addiction

Parameters	GROUP		TOTAL	
	A	B	No	%
1. Educational status				
- Illiterates	5	6	11	30
- Below class X	2	1	3	8.3
- Above class X	2	3	5	13.85
- Graduates	9	8	17	47.05
2. Habitat				
- Rural	7	6	13	36
- Urban	11	12	23	64
3. Dietary habit				
- Vegetarian	8	10	18	50
- Non Vegetarian and mixed	10	8	18	50
4. Socio-economic status				
- Less than 50,000 P.A.	4	3	7	20
- Less than 1,50,000 P.A.	8	10	18	50
- More than 1,50,000 P.A.	6	5	11	30
5. Occupation				
- Students	4	3	7	20
- Service man	6	9	15	41
- Business man	4	2	6	27
- House wives	3	2	5	14
- Farmer	1	2	3	8
6. Addiction				
- Smokers	8	6	14	39
- Alcoholics	1	2	3	8
- Non addiction	9	10	19	53

Punarnavāriṣṭa contains punarnavā, balā, pāṭhā, vāśā, guḍūcī, citraka, guḍa and caturjāta, and is indicated in śoṭha, kāsa, śvāsa, kuṣṭha and bhagandara. The ingredients are mainly suggestive of vāta and kapha pacification along with śoṭhaghna nature. Due to the effect of āma and rasadhātu-malarūpi-kapha in prāṇavahasrotas, śoṭha and saṅga (obstruction) occur, which get corrected by the effect of ingredients in the Punarnavāriṣṭa. This also enhance the vyādhikṣamatva of the individual, which is very much essential to rectify and correct srotasas to act as a rasāyana by supplying proper nutrients to prāṇavahasrotas to prepare a zone which is capable of fighting against foreign substances. That is why patients of tamakaśvāsa got remarkable improvement in combination with Simhanādaguggulu.

Efficacy of the drugs

Clinically, patients got remarkable improvement in well being, reduction of symptomatology and enhancement of digestive functions followed

TABLE 2b

Demographic profiles - Family history, incidence of allergies, prakṛti, duration of disease, etc.

Parameters	GROUP		TOTAL	
	A	B	No	%
1. Use of anti asthmatic drugs				
- Salbutamol	10	8	18	50
- Theophylline	10	8	18	50
- Carticosteriods	12	10	22	61
- Homeopathy	6	4	10	28
2. Family History				
- Positive	4	2	6	17
- Negative	14	16	30	83
3. Incidence of allergies				
- Positive	18	18	36	100
- Negative	0	0	0	0
4. Incidence of prakṛti				
- Vāta pitta	6	4	10	25
- Vāta kapha	5	6	11	32
- Pitta kapha	7	8	15	43
5. Incidence of duration of diseases				
- 0-1 year	10	9	19	53
- 0-5 years	3	4	7	20
- 5-10 years	5	5	10	27
6. Seasonal incidence of attack				
- Rainy season	6	4	10	27
- Winter	12	12	24	67
- Summer	6	4	10	27

by correction of regular bowel habit (Table 3). In objective parameters, absolute eosinophil count was remarkably reduced, which was statistically highly significant (Table 4). It may be because of the correction of rasadhātvagni. Improvement in auscultatory finding was also observed (Table 5). It may be due to proper elimination of malarūpi-kapha from prāṇavahasrotas resulting into cleansing the airways and leading to proper movement of air inside the healthy prāṇavahasrotas. Reduction in pulse and respiratory rates observed were statistically highly significant (Table 4).

Proper assessment of efficacy of the given study, supported by an authenticated and sophisticated instrument spirometer shed light on pulmonary functions. It was observed that patients got statistically highly significant in forced expiratory volume (FEV_1) in first seconds, forced vital capacity (FVC) and peak expiratory flow rate (PEFR) (Table 6). It may be due to correction of the components of samprāpti

TABLE 5
Auscultatory finding rhonchi

Group	BT	AT_3
1. Group A	14	6
2. Grpup B	12	4

TABLE 3
Symptomatology

Symptoms and signs	BT		AT_3		Total (%)	
	Gr. A	Gr. B	Gr. A	Gr. B	BT	AT_3
• Peroxysms of dyspnoea, cough and wheeze and specific season or with specific allergies	18	18	6	4	100	28
• No respiratory symptoms during episodes	8	6	13	15	38	78
• Dyspnoea	18	18	4	3	100	19
• Cough	11	12	0	0	63	0
• Wheeze	12	14	0	0	72	0
• Chest tightness	8	6	0	0	38	0
• Breathlessness on exertion during night and early morning	18	18	5	1	100	16
• Allergy history	18	18	-	-	-	-
• Tachycardia	10	8	5	5	50	28
• Sweating	6	6	0	0	33	0
• Patient feels difficulty in expectorating the thick cough and after expectorating feels transient relief.	18	18	4	0	100	11
• Disturbance in sleep, difficulty on lying down the bed and feels better on sitting posture and after taking warm meal	18	18	3	0	100	8

TABLE 4
Absolute eosinophil count, pulse rate and resipiratory rate

Groups	Mean + S.D.					Paired 't' test
	BT	AT_1	AT_2	AT_3	BT-AT_3	
1. Absolute eosinophil count						
Group A (n=18)	636.56 ± 163.87	477.8 ± 121.44	359 ± 83.01	269.58 ± 76.86	362.72 ± 102.15	15.063 P <.001*
Group B (n=18)	666.67 ± 140.33	526.35 ± 118.35	391.5 ± 86.8	288.55 ± 66.45	377.8 ± 85.13	18.268 P <.001*
2. Pulse rate						
Group A (n=18)	92 ± 16.03	86.6 ± 14.12	83.7 ± 14.88	81.8 ± 14.42	10.167 ± 11.30	3.8178
Group B (n=18)	86.45 ± 15.32	83.94 ± 13.95	81.22 ± 14.06	80.5 ± 14.78	6.0 ± 6.615	P between .05 & .02**
3, Respiratory rate						
Group A (n=18)	20.94 ± 3.68	18.83 ± 2.895	17.78 ± 2.48	16.21 ± 2.98	2.66 ± 1.41	7.987 P <.001*
Group B (n=18)	19.88 ± 3.178	18.38 ± 2.56	16.83 ± 1.823	14.77 ± 8	5.2 ± 2.533	8.7102 P <.001

* Highly significant, ** Significant

TABLE 6
Pulmonary function tests

Groups	Mean + S.D.					Paired 't' test
	BT	AT_1	AT_2	AT_3	BT-AT_3	
1. EV_1						
Group A (n=18)	1.091 ±. 387	1.15 ± 382	1.311 ± .419	1.511 ± .433	0.375 ± .317	5.02 P <.001*
Group B (n=18)	1.09 ± .38	1.17 ± .425	1.3 ± .42	1.43 ± 725	-3972 ± .2266	7.638 P <.001*
2. FVC						
Group A (n=18)	1.144 ± .43	1.229 ± .436	1.367 ± .44	1.557 ± .437	-.4138 ± .268	6.557 P <.001*
Group B (n=18)	1.14 ± .44	1.241 ± 47.57	1.372 ± .432	1.596 ± .4348	.4444 ± .26	7.261 P <.001*
3. PEF						
Group A (n=18)	184.16 ± .51.23	199.17 ± 49.75	221.16 ± 41.57	282.7 ± 36.2	-92.5 ± 55.895	7.026 P <.001*
Group B (n=18)	185.27 ± 52.31	199.38 ± 40.82	223.16 ± 40.82	289.0 ± 34.46	-98.16 ± 48.66	8.557 P<.001*

* Highly significant

(pathogenesis) of tamakaśvāsa by selected drugs.

It is further observed that Group 'B showed slight better response in comparison to group 'A' in all the parameters of assessment criteria.

Conclusion

Tamakaśvāsa (bronchial asthma) is a disease of prāṇavahasrotas (respiratory system) manifesting due to exposure to dust, pollens, fog, etc. characterized by chest-tightness, wheeze and cough.

Study designed to understand the efficacy of Simhanādaguggulu and Punarnavāriṣṭa in one group (A) and Simhanādaguggulu and Punarnavāriṣṭa, along with kuñjalkarma and prāṇāyāma in the other group (B). Comparative analysis of both the groups revealed that group 'B' showed slight better response in comparison to group 'A'.

This study strongly recommends the above regimen for the effective management of tamakaśvāsa.

Reference

1. Institute of Respiratory distress, Kolkata, University College of Kolkata.
2. *Harrisan's Principal of Internal Medicine*, Vol-II, P 1508, 16th Edn., Mcgraw Hill Publication.
3. Kashinath Shastri, *Carakasamhita* (Vidyotini Hindi commentary), Cikitsā sthāna 17, pp 508-531, Chaukhambha Vishwabharati, Varanasi
4. Guideline Initiative for Asthma 2004 (WHO Guideline).
5. Siddhinandan Mishra, *Bhaiṣajyaratnāvali* (Siddhiprada commentary - 42/188-192, Shoth Roga Chikitsa) pp 785-786,
6. Indradev Tripathi; *Cakradatta*, (Vaidyaprabha Hindi Commentary, Amavata Chikitsa- 25/29-34), pp 168-169, Chaukhambha Sanskrit Sansthan, Varanasi
7. Havendra Sharma, *Gheranda Samhita* - Translation (1/38-39), P 11. Chaukhambha Sanskrit Sansthan, Varanasi.
8. Ibid, pp 55-65

Aryavaidyan Vol. XXI., No. 3, Feb. - Apr. 2008, Pages 160 - 163

MENOPAUSE - AN ĀYURVEDIC UNDERSTANDING

K.V. Mamatha[1], Chandan Mal Jain[2] and Hemavathi[3]

Abstract: Menopausal symptoms are 'unwanted guests' in the peaceful evenings of a women's life. Generally it occurs at 50 years of the age due to ageing (jarapakvata) of the body (śarīra). The signs and symptoms of menopause are seen in the symptoms of jarāvasta (old age). So, menopause can be tackled successfully in lines of jaracikitsa. Rasāyana drugs that mainly act on rasadhātu help to overcome the symptoms by providing better nourishment and improving tissue perfusion. Menopause can be managed successfully by ācārarasāyana (conduct and rituals), yoga and meditations without taking the HRT.

Menstruation is not a pleasant experience for some, and most women curse themselves for being a female during the stressful period. But the very thought of its cessation brings a feeling of insecurity in them. It also brings in a feeling of loss in feminity and charm. For infertile couples, it is the end of their rays of hope of ever having a child. It also frightens them because of its increased incidences associated with cancer, osteoporosis and hypertension; and it may also remind them of their old age. There may be only a few who receive the cessation of menstruation as a part of aging; but in the present scenario, with the controversies of HRT, unpleasant symptoms of menopausal syndrome and the increasing complications it is becoming an unwanted guest peeping into the pleasant life of a female.

In olden days, menopausal syndrome or HRT was not a matter for discussion and didn't require any treatment. The lifestyle of those days were naturally reduced the intensity of symptoms. The present day scenario is contributed by stressful lifestyle, food habits, minimal physical activity and loss of emotional family bonding.

The lifestyle with strict observation of ṛtucarya (seasonal regimens), dinacarya (daily regimens) naturally keeps the body fit. Abhyaṅga performed every day takes care of the skin and bone. It prevents the roughness and wrinkling of skin, untimely graying of hair, hair-loss, balding, osteoarthritis and maintains the vigor and vitality of the tissues. Appropriate care, adequate rest and good diet during garbha (pregnant) and sūtika kālas (puerperium) also

1. *Department of Prasuti Tantra and Stree Roga, SDM College of Ayurveda, Kuthpady, Uduppi 574 118*
2. *Associate Prof & HOD, Dept. of Prasuti Tantra & Stree Roga, National Institute of Ayurveda, Jaipur*
3. *Hemavathi, Amritha Ayurvedic Medical College, Vallikkav, Kollam, Kerala*

help in the maintenance of good health and fitness of body tissues. It helps to regulate the hormonal imbalances, maintain the strength of genital organs and their supports preventing the senile disorders like early prolapse, stress incontinence and related complaints.

There are very few references to menopause in āyurvedic classics. Regarding the age of menopause, it is said that it sweeps in at the pañcaśatavarṣa (50 years) due to ageing[1,2]. Kaśyapa describes ārttavotpatti (menarche), but the age given there, is only prāyika (probable) and not the exact. Depending upon the āhāra and vihāra (life and dietary regimen) and ārogya (health) of the female, age of menarche and menopause may differ by a few years which are practically seen around 45-55 years. Bheḷa and Ḍalhaṇa clarify that the reason for non-appearance of raja (menses) before menarche is aparipūrṇa dhātu avasta (immaturity of body system), whereas the reason for its debilitation (kṣaya) at the age 50 is because of kṣaya of śarīradhātu (reduction of body tissues) due to ageing.

The word ārtava or raja is referred to in the āyurvedic classics in different contexts with different meanings. It is used to denote menstrual blood, ovarian hormones, and at certain places it is told to be responsible for garbhotpādanakarma (conception) that is ovum; and some authors consider ārtava as the eighth dhātu present only in females. Ārtava is produced by rasadhātu in a period of one month. According to Śārṅgadhara, the process of this pariṇāma involves pittadoṣa[3a].

Pitta is nothing but part (amśa) of agni (digestive fire) situated in different dhātus as dhātvagni. In vṛdhāvasta (old age), vāta increases, kapha decreases, and accordingly pitta too declines[3.] All these changes lead to agnimāndhyata (low digestive fire), dhātuśoṣaṇa and dhātukṣayata (poor nourishment of body tissues and their emaciation). Rasadhātu being ādyadhātu (prime) and āśraya (seat) for kapha, naturally gets affected more leading to emaciation of its upadhātu, ārtava as well. This in turn leads to cessation of menstruation. According to Vāgbhaṭa, ārttavahāni (menopause) begins at 50 years of age as a consequence of aging process. On analyzing the symptoms of menopause, one can see the symptoms of increased (vṛdha) vāta, reduced (hīna) kapha and all dhātus in their declined stage (kṣīṇāvasta)[6, 7].

Though menopause is a physiological entity, in some it may become a bitter experience because of symptoms like hot flushes, sensation of heat all over the body especially on face followed by profuse sweating and feeling of cold disturbing the sleep at night, dyspareunia due to dryness of vagina, a result of hypo estrogenic state. Also, other symptoms like atrophic vaginitis, senile endometritis, urinary urgency, dysuria, stress incontinence can be seen. All these are because of thinning of the mucosa due to the hypo estrogenic condition and lack of muscle tone in the pelvis. These may even lead to the prolapse of uterus. The skin losses its elasticity, breast becomes pendulous and in some, due to altered ratio of estrogen and androgen may even cause increased hair growth on face and male type of features. Also, the genital organs get atrophied with the body to cervix ratio 1:1 (2:1 being the normal) as seen before puberty. The ovaries get shrunken, wrinkled and white; tubal muscle coat thins out; cilia becomes flattened and the pH once again turns to be alkaline as before puberty; vulva and pubic fat disappears; hair becomes scanty and skin thinner. Other symptoms are headache, insomnia, irritability, anxiety,

dementia, mood swings and inability to concentrate.

With the decrease of estrogen, cholesterol increases and the heart protective-HDL level decreases. This alters the ratio of LDL:HDL level, and further decrease in estrogen causes cardiac pathologies. In bones estrogen deficiencies reduces the Ca+ absorption and increases the osteoclastic activities leading to osteoporotic changes making a female more prone for fractures.

In āyurvedic terms, when we see the symptoms of reducing kapha (kaphakṣayalakṣaṇas), burning sensation within the body (antardāha) is said as one of the symptoms. Reduced (hīna) kapha and increased (vṛddha) vāta along with pitta, produces burning (dāha) in the body. It is not continuous in nature, which itself, being the typical feature of vāta, is episodic or in bouts, very fast in onset and subsides, followed by coldness (śītaḷata) and roughness (rūkṣata). Dryness of the body, skin becoming inelastic, wrinkled and loosing its luster (kānti) and complexion (prabhā) are seen with menopause, which are the symptoms of kaphakṣaya, rasakṣaya, raktakṣaya and vātavṛddhi. Dryness (snehābhāva) in the skin makes it more wrinkled and dull. The vaginal area is also affected by these changes leading to senile vaginitis and dysparunia. In āyurvedic classics, bāla (very young) and vṛdhastrī (very old lady) are considered to be same for all the physiological, pathological and treatment aspects. The changes which are seen during menopause can be taken as similar to the condition as before puberty like size of uterus, ratio of cervix to body, pH of vagina, etc. which, in case of puberty, is due to the incomplete formation and proliferation; and here, it is due to vṛdhāvastha (ageing) and degenerative reasons.

Drying up of all the seats of kapha (śḷeṣmāśayas) except stomach (āmaśaya) and looseness of joints (sandhiśaithilya) are the symptoms of kaphakṣaya. Even in the vṛdhavātāvasta, sandhivedana, snehābhāva, sandhispuṭana (producing sound during movements) are seen. Asthiśaithilya (osteoarthritic changes), asthitoda (arthralgia), asthiśūnyata (degenerative changes) are found in cases of kṣaya of rasadhātu, māmsadhātu, medhodhātu, asthi and majjadhātus. Due to mutual dependency (āśraya-āśrayī bhāva) of vāta and asthi, when there is increase in vāta, there will be kṣaya in asthidhātu.

These descriptions show the degeneration taking place in the asthidhātu, leading to osteoporosis during menopause. Decrease of kapha in the heart (śḷeṣmakṣaya in hṛdaya) leads to palpitations (hṛddrava), arrhythmias and other ischemic cardiac complications. Insomnia (nidrānaśa), debilitation (dhaurbalya) and prajāgaraṇa are the symptoms of vṛdhavāta; when it is further associated with rasakṣaya, causes irritability (śabdasahiṣṇuta), distress (dīnata), dullness (mḷānata), and in persons of low threshold, delirium, loss of strength, inefficiency of organs and sensory and motor reflexes will also get diminished or loose their sharpness[7]. This can be interpreted as inability to concentrate, dementia, forgetfulness, moods wings, etc. Though some put on weight, kārśya can be seen in the individual organs in the form of atrophic changes like in breast, uterus and ovaries. Hence, we can say menopause is a condition which can be included under the state of dhātukṣayāvasta associated with jarāvasta (old age). But in āyurvedic classics, we do not find the references to menopause as something problematic or its treatment.

If we consider the management aspect, aging (jara) is taken as a natural disease (svābhāvika-vyādhi) in the classics, which is associated with agnimāndya (reduced digestive fire) and dhātukṣaya (debilitation of body tissues) which occurs in the vicious cycle. Hence the use of rasāyanas is advised to overcome this situation. Rasāyanas (rejuvenate therapy) are acting on agni, rasadhātu and srotas (body channels) and improves the nourishment of dhātus. This improvement brings about improved quality of tissues leading to longevity, preventing early atrophic changes, improving immunity and mental competence and reducing senile changes. Along with this, ācārarasāyana (conduct and rituals) or medhākāmyarasāyana, yoga, and meditation can also be advised to give psychological spirit. This gives good mental support and prevents the psychological symptoms of menopause.

References

1. रसादेव स्त्रीयां रक्तं रज: संज्ञा प्रवर्तते ।
   तत् वर्षात् द्वादशादूर्ध्वं याति पञ्चशता क्षयम् ।।
   (सु.सू. १४/६)
2. द्वादशादूर्ध्वं वर्धमान शरीर धातूनां पञ्चशत ऊर्ध्व जरापचीयमान मान शरीर धातूनां क्षयं याति,
   (सु. सू. १४/६, ड. टीका)
3. बाल्ये विवर्धते श्ळेष्मा पित्तं स्यान्मध्यमेऽधिकम् ।
   वार्धके वर्द्धते वायुर्विचायैर्तत् उपक्रमम् ।।
   (शा. पू. ६/४८)

3a. पाचित पित्त तापेन रसाद्य धातव: क्रमात् ।
   शुक्रत्वं यान्ति मासेन तथा स्त्रीणां रजो भवेत् ।।
   (शा. सं.)

4. तस्यैवाग्नि कदाचित् मन्दो भवति वर्षासु वार्धक्ये ।।
   (चक्र. टिका. च. सू. ५/३)
5. यत्र यत्र वृद्धि: तत्र तत्र श्ळेष्मा यत्र यत्र क्षय तत्र वायु वृद्धि स्तर्पणात् बृंहणात् भवति ।।
   (शा. पू. ६/६२)
6. यत्र वात वृद्धौ वाक्पारुष्यं कार्श्यकार्ष्य्य गात्र स्पुटनमुष्णकामित निद्रानाशोऽल्पबलत्वं गाढवर्चस्त्वम् ।। – (सु. सू. १५)
7. श्ळेष्मा क्षये रुक्षत्वं अन्तर्दाह आमाशयेतर– श्ळेष्माशयानां सन्धि शैथिल्यं तृष्णा दौर्बल्यं प्रजागरं च ।। – (सु. सू. १५/७)

Aryavaidyan Vol. XXI., No. 3, Feb. - Apr. 2008, Pages 164 - 166

CONCEPT OF PAIN IN ĀYURVEDA

Shashi Sharma[1], S.S. Bedar[2], K.K. Pandey[1] and Manjari Dwivedi[1]

Abstract: Pain is a very common symptom and all of us experience pain sometimes or the other. Pain is an unpleasant sensation but, on the whole, it is usually beneficial to the man (or animal). Pain makes us conscious of the presence of an injurious agents and calls for the removal of the injurious agent by appropriate measures. Different types of pain (śūla) are described in āyurveda.

Introduction

Pain is a subjective experience that is interpreted as symptomatic evidence of acute tissue damage or of emotional responses. The seat of pain is mind and the body equipped with sense organs except different hairs on the body, tips of nails, ingested food, stool, fluid and sense objects[1]. All types of pain and sensations cease to exist in the state of yoga and mokṣa[2]. In āyurveda the terms śūla, vedana, rujā, pīḍā and dukha are used to denote pain.

Hāritasamhita mentions the mythological origin of śūla[3]. According to this, God Viṣṇu diverted the triśūla of Lord Śiva towards the earth to protect Kāmadeva. From this triśūla on earth arose śūla in human beings. As it originated from triśūla, it was called śūla. This mythological origin of pain reveals that pain occurs due to tissue injury.

Suśruta describes śūla as śaṅku sphoṭanavat tīvra vedanā[4]. According to him, śūla is not only complication of gulma, it is an independent disease as well due to voluntary retention of flatus, stool, urine or due to overeating, indigestion, over-exertion and use of dry food articles which derange and aggravate vāyu. Vāyu is responsible for violent, cutting and spasmodic pain in the main cavity of trunk (koṣṭha)[5]. Aggravated and vitiated vāyu is the main factor that causes śūla.

Mechanism of pain

The mechanism of śūla has been described by Kaviraj Gananath Sen. According to him, the pain is felt by a person when sensory nerves are affected by any local irritable substance. The cause of nerve stimulation by local irritable substance is attributed to srotovarodha (obstruction of channels), udāvarta (reverse movement of vāyu), vraṇa śotha (inflammation), kṣata (wound), āghāta (injury), kriyāvaiṣamya (impaired function) and daurbalya (weakness)[6].

In an inflammatory process that leads to

1. Department of Prasuti Tantra, I.M.S., B.H.U., Varansi; 2. Department of Basic Principles, Babe-Ke Ayurvedic College, Daudhar, Moga (Pb.)

formation of an abscess, there can be no pain without the agency of vāta, no pāka without pitta and no pūya without kapha[7]. Commenting on it, Ḍalhaṇa observes that the vitiated pitta that acts on vāta and kapha brings these factors within the ambit of its influence, causes deficiency in them and changes their properties thereby leading on to the causation of pain and the formation of pūya respectively.

Types of pain

Suśruta classifies different types of pain as under:-

1. Vātajaśūla:- Patient experiences violent colic when on empty stomach and feels difficulty in breathing. The limbs seem to go numb or stiff and the flatus, stool and urine are evacuated with great difficulty.
2. Pittajaśūla:- Thirst and burning sensation in the body along with excruciating pain, giddiness, loss of consciousness, desire for cold things and amelioration on application of cooling measures are the general features.
3. Kaphajaśūla:- Agonizing pain with nausea, excessive fullness of stomach and feeling of heaviness in the limbs are the symptoms.
4. Dvidoṣajaśūla:- It is because of vitiation of two doṣas, and the symptoms are associated with that doṣas.
5. Sannipātajaśūla:- It is characterised by the symptoms of three simultaneously deranged doṣas of the body and it is considered hard to cure.

Seat of pain

The term vyādhi is defined as the state in which both the body and mind are subjected to pain and misery (dukha). Suśruta defines it as that which proves to be a source of torment or pain to the puruṣa[8].

Aruṇadatta describes śūla as a term which implies the infliction of pain either on the mind or body or on both. Patañjali's Yogadarśana refers to it as pratikūla vedana or a painful sensation (dukha); anukūla vedana would mean a pleasurable sensation (śubha)[9].

Pain described as dukha:- The word dukha (misery or unhappiness) and vyādhi (disease) are synonyms. Similarly, sukha (happiness) and ārogya (health) are synonyms[10]. In āyurveda, the state of discomfort or pain is included under the term vyādhi. Even the sensation of tṛṭ (thirst), kṣut (hunger), emotions of rāga and dveṣa (attraction and repulsion) are included under natural vyādhi and require necessary attention to insure a healthy and useful life[11].

According to Suśruta, dukha (pain) has been classified into three types depending on the nature of abhighāta (stress), responsible for their causation[12]. They are ādhyātmika dukha (psychosomatic pain), ādhibhautika dukha (pain caused by environmental stress) and ādhidaivika dukha (pain caused by providential causes i.e. acts of God).

Human system is also classified on the basis of pain endurance, which is based on sattvaparīkṣa (mental faculties). These are pravara sattva (superior type), madhya sattva (mediocre type) and āvara sattva (inferior type)[13].

Conclusion

In āyurveda the term vedana has very comprehensive meaning. It includes both pleasant and unpleasant sensations (anukūla and pratikūla vedana). All types of pleasant and painful sensation will vanish only in a state of salvation and in yoga. But in practice the term vedana, śūla, rujā or pīḍā

denote only painful sensations, which occur due to tissue injury or emotional reactions. Pain is universally understood as a signal of an abnormal condition of the body and it is the most common symptom that brings a patient to a physician's attention.

References

1. Carakasamhita, Śārīasthānam, 1/136
2. Ibid - 1/137
3. Hāritasamhita
4. Suśrutasamhita, Uttarasthānam, 42/81
5. Ibid - 42/67-69
6. Sidhāntanidānam
7. Suśrutasamhita, Sūtrasthānam, 17/12
8. Ibid - 1/34
9. Patañjali's Yogadarśana
10. Carakasamhita, Sūtrasthānam, 9/4
11. Carakasamhita, Śārīasthānam, 1/134-135
12. Suśrutasamhita, Sūtrasthānam, 24/4
13. Carakasamhita, Vimānasthānam, 8/119

Aryavaidyan Vol. XXI., No.3, Feb. - Apr. 2008, Pages 167 - 170

EVALUATION OF SELF-PREPARED HIṄGUTAILA

C.S. Shreedhara[1] *et al.**

Abstract: Hiṅgu (*Ferula asafoetida*), is reported to possess anti-inflammatory, carminative, spasmolytic and expectorant activity. It is indicated in the treatment of colic, chronic bronchitis and hysteria and is used for the treatment of many other disorders as indicated in Indian Materia Medica. Keeping this in view, an attempt has been made to prepare taila as per the classical procedure for nasya (errhine) in the treatment of kapha predominant nāsāroga and it has been found to be very effective in patients suffering from chronic sinusitis.

Introduction

Asafoetida, commonly known as hiṅgu in Sanskrit, botanically termed as *Ferula asafoetida* or *Ferula foetida* (Apiaceae), is a herb distributed through wild in Punjab, Kashmir, Persia and Afghanisthan[1]. Roots of this plant contain aromatic gum-resin, obtained by incision. Various constituents are organic sulphur compound, volatile oil, resin (ferulic acid esters of asaresino-tannol, free ferulic acid) and gum[1]. It is used in the treatment of whooping cough, pneumonia, chronic bronchitis and asthma in adults. In view of this, the taila[2,3] was prepared for nasya in the treatment of kapha pradhāna nāsārogas (kapha predominant nasal diseases) and use on patients suffering from sinusitis. The preparation was found to possess significant therapeutic use and hence has been taken up for standardisation of the preparation.

Materials and methods

Preparation

Unique formulations indicated for various therapies and medicaments prepared basically used by oil, ghee or other fatty substances are included under snehakalpana, and which is defined as the formulation, where 1 part of medicated herbs (in paste form), 4 parts of oil or ghee and 16 parts liquids (water/liquids) are used and boiled on low flame to remove the moisture content. The advantages of Snehakalpas are, to extract fat soluble active principles of plants, to enhance the effect of herbs by processing them in oil, to preserve drugs for a longer duration and hasten the absorption of drugs[5-9].

The clinical efficacy of Hiṅgvādi taila was encouraged the authors to prepare Hiṅgutaila with 25 grams of purified asafoetida, 100 ml of

*Aswatha Ram H.N[1], Basavaraj S Hadapad[2] and Anupama V Nayak[2]
1. *Dept. of Pharmacognosy, Manipal College of Pharmaceutical Sciences, Manipal University, Manipal - 576 104, Karnataka*; 2. *Dept of Ayu., Kasturba Medical College, Manipal University, Manipal-576 104.*

mustard oil and 400 ml of Gomūtrārka. These were boiled on low flame and prepared the oil. Then, after confirmative tests of properly prepared oil, it was cooled and stored in jars with tight lids for chemical evaluation. While frying asafoetida the paste-like structure with strong smell changed to a crisp form. While warming the oil, smell of mustard oil was strong enough, golden yellow in colour and thick in density. When asafoetida and gomūtrārka were added, the odour of both was very penetrating and oil started becoming more brownish yellow and thick. This Hiṅgutaila is used for nasya in chronic cases of sinusitis with significant effect.

Evaluation

Organoleptic

- Colour - Pale yellow turbid viscous liquid
- Odour - Charactersitic and alliaceous
- Taste - Bland and slightly acrid

Physico-chemical

Wt/ml was determined using specific gravity bottle as per the method described in Indian Pharmacopoeia[10]. The viscosity was measured in Brookfield viscometer[11]. Refractive index was found as per the method described in Indian Pharmacopoeia[13]. (Table 1)

TLC profile

The taila was subjected to TLC studies[12] after extracting a known quantity of the oil with 10 ml portions of methanol successively. Methanol extracts were pooled, concentrated and the concentrated methanolic extract of the oil was spotted on silica gel G plate along with standard ferulic acid. Chromatogram was carried out by using solvent system (benzene:acetic acid:water – 6:7:3). Spots were located by observing the plate in UV light (greenish blue fluorescent spots) and Rf value of standard ferulic acid and ferulic acid in the oil was calculated (Table 1). Silica gel was scrapped in the place where ferulic acid was located and suspended in methanol. Suspension was filtered and filtrate containing dissolved ferulic acid was subjected to UV absorbance lmax (322 nm) studies. The UV absorption spectrum is shown in Figure 1.

TABLE 1

Values of physico-chemical evaluation

Particulars	Found values	IP values
Weight/ml (g)	0.9140-0.9206	0.8828
Viscosity	-	4200 cp
Refractive index	1.4643-1.4669	1.5257-1.5304
Rf value (Ferulic acid)	-	0.8683

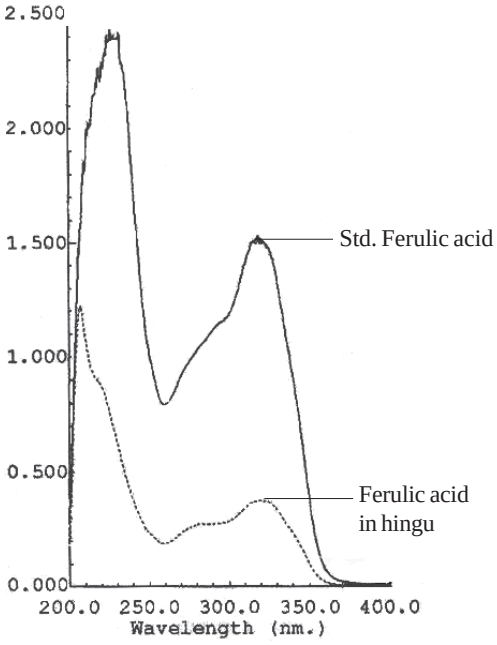


Fig. I. UV absorption spectrum of Ferulic acid and Hiṅgutaila showing ë max at 322 nm.

Chemical evaluation

Acid value

Acid value was determined by the method described in Indian Pharmacopoeia[14]. Determination of acid value indicates freshness of the oil and also rancidity. Higher the acid value means that the oil is not fresh and must have undergone rancid. 10 g of the oil was accurately weighed into a conical flask, dissolved in a mixture of equal volumes (25 ml) of previously neutralized alcohol and solvent ether. The mixture was titrated with standard 0.1N potassium hydroxide using phenolphthalein as indicator to pale pink end point. Acid value was calculated using the formula: $\frac{a \times 5.61 \times n}{w \times 0.1}$ where a = sample titer volume in ml, w = weight of the oil sample in gram and n = normality of KOH (Table 2).

Saponification value

Saponification value is the number of milligrams of KOH required to neutralize the free acids and to saponify the esters present in one gram of the oil or fat[15]. It indicates the number of mg of KOH required for neutralizing the fatty acids resulting from the complete hydrolysis of one gram of the oil or fat.

2 g of the oil sample was weighed accurately and transferred to reflux condenser, refluxed with 25 ml of standard 0.5 N alcoholic potassium hydroxide on a water bath for 1 hour. The contents were cooled and titrated against standard 0.5 N HCl, using phenolphathalein solution indictor to yellow colour end point. A blank titration was carried out in the similar manner omitting the sample. Saponification value was determined using the following formula: $\frac{(b-a) \times 28.05 \times n}{w \times 0.5}$ where 'a' = sample titer volume in ml, 'b' = blank titer volume in ml, 'w' = weight of the oil sample in gram and 'n' = normality of HCl +

TABLE 2

Values of chemical evaluation

Particulars	IP values	Found values
Acid value	Not more than 4	3.00-3.63-7.78
Saponification value	170-176	165.60-172.83-179.4
Iodine value	98-106	96-99.62-104.23

Iodine value

Iodine monochloride method as described in Indian Pharmacopoeia was followed to determine the iodine of the sample[16]. Iodine value is the number in grams of iodine absorbed by 100 g of the oil or fat. This value helps to know the degree of unsaturation and oils will have higher value as they are composed of unsaturated fatty acid.

G of oil sample was weighed accurately, placed in iodine flask containing measured excess of (25ml) of iodine monochloride solution. The flask was kept in dark for 15 min with occasional shaking and 15 ml of potassium iodide solution, 100 ml of water, and 0.2 ml of starch solution were added, shaken and titrated with standard 0.1N sodium thiosulphate to colourless end point (a ml). A blank titration was also carried out in the similar manner omitting the sample (b ml). Iodine value of the sample was calculated using the following formula:

$$\frac{(b-a) \times 1.269 \times n}{w \times 0.5}$$

where, 'a' = sample titer volume in ml, 'b' = blank titer volume in ml, w = weight of the oil sample in gram and 'n' = normality of $Na_2S_2O_3$ (Table 2).

Results and discussion

Evaluation of the preparation has revealed that there is marginal increase in refractive index, acid value and saponification value (Table-2) and may be attributed to the presence of ferulic acid. Decrease in weight/ml (Table-1) and marginal decrease in Iodine value (Table-2) was observed and may be attributed to the various components dissolved in the oil apart from ferulic acid.

Various parameters determined for the preparation is compared with the values indicated in the Pharmacopoeia for the base oil. Increase or decrease in these values may be attributed to the various components of hiṅgu dissolved in the oil. In this study, asafoetida is considered as the main drug and TLC profile for ferulic acid in asafoetida serves as one of the major evaluation parameter along with viscosity. Hiṅgutaila was showing the peak for ferulic acid at λmax 322 nm, which corresponds to the peak of standard ferulic acid (Fig.1). All the above parameters could help in the process of evaluation upon preparation of oil and can serve as standard parameter for evaluation.

Conclusion

It is evident that the above parameters can be used to evaluate the presence of asafoetida as methods envisaged are simple, easy to perform, inexpensive, reproducible and accurate. This suggests a suitable method of evaluation of those āyurvedic preparations containing hiṅgu as one of the ingredients.

References

1. Nadkarni A.K., *Indian Materia Medica*, Vo.-I, Popular Prakashan, pp 537-540.
2. *Yogaratnakara*, 7th edn., Chaukhambha Publications, New Delhi, P 329, 1999.
3. Karnick, C.R., *Pharmacopoeial Standards of Herbal Plants*, Vol-I, Sri Sadguru Publications, Delhi, P 15. 1994
4. Charaka Chaturanana Chakrapani, *Cakradatta*, (Cikitsāsaṅgraha), commented by Shivadasasena, edited by Pandit Kulapathy V.A. Upadhidhari; 1st Edn. 1993, Chaukhambha Orientalia.
5. Vaidya Sri Laxmipathy Sastry, *Yogaratnākara* with Vidyotini Hindi Commentary, edited by Bhishagratna Sri Brahma Shankara Shastry: 7th Edn., Chaukhambha Publications, pp 123-125, 1999.
6. Śārṅgadhara, *Śārṅgadharasamhita* with Commentary Adhamallas Dipika and Kasirams Gudhartha Dipika, edited by Parasurama Sastri, Vidyasagar, Chaukhambha Orientalia, 5th Edn.,pp 212-215, 2002.
7. Sri Bhava Misra, *Bhāvaprakāśa* including Nighaṅṭu portion with Vidyotini Hindi Commentary by Brahmasankara Misra and Rupalalaji Vaisya, 1st part, 11th Edn., Chaukhambha, pp 818-821, 2004.
8. Sri Vaidya Shodala, *Gadanigraha*, with Vidyotini Hindi Commentary by Sri Indradeva Tripathi, edited by Sri Ganga Sahaya Pandeya. Part II, Chaukhambha Sanskrit Series, 1st Edn., P 139, 1969.
9. Sri Govindadasa, *Bhaiṣajyaratnāvali*, with Vidyotini Hindi Commentary by Sri Kaviraja Ambikadatta Sastry edited by Ayurvedashastracharya Rajeshwaradatta Sastry, 17th Edn., Chaukhambha Publications. 2004.
10. *Indian Pharmacopoeia*, Government of India, 2nd edn., P 917, 1966.
11. Ibid, P 919.
12. Harborne J.B., *Phytochemical methods; A Guide to Modern Techniques of Plant Analysis*, 3rd Edn., Chapman & Hall, London, P 52. 1998.
13. *Indian Pharmacopoeia*, Government of India, 2nd edn., P 915, 1966.
14. Ibid, P 934.
15. Ibid, P 936.
16. Ibid, P 935, 1955.

Aryavaidyan Vol. XXI., No.3, Feb. - Apr. 2008, Pages 171 - 174

ANTIMICROBIAL ACTIVITY OF *TAGETES ERECTA* LINN. AND *ARGEMONE MEXICANA* LINN.

B. Uma Reddy *et al.**

Abstract: This work evaluates the antimicrobial activity of two medicinal plants viz. *Tagetes erecta* Linn. and *Argemone mexicana* Linn. against nine medically important pathogenic microorganisms. The antimicrobial activity was determined by agar well diffusion technique. It was observed that *Tagetes erecta* Linn. is having best antimicrobial activity.

Introduction

Due to the active principle identification and standardisation of the medicinal herbs, they are viewed as a synthetic laboratory, as they produce and contain a number of chemical compounds. These compounds, responsible for medicinal activity of the herb, are secondary metabolites, for e.g. alkaloids, flavonoids, terpenoids, tannins, saponins, resins, oleoresins, sterols, lectins and polyphenols. Most of these compounds function in defense mechanism against predators and pathogens as allelopathic agents or attractants. Therefore, random screening of plants for bioactive chemicals is as important as the screening of ethno-botanically targeted species.

Tagetes erecta Linn. belongs to the family Asteraceae and is commonly called as Marigold. It grows erect to about 1m height with pinnatifid leaves and orange-yellow coloured flowers. *Argemone mexicana* Linn. belongs to the family Papaveraceae and commonly called as Mexican poppy. It is a robust herb with spreading branches, sessile leaves and bright yellow coloured flowers.

Biotechnology in medicinal plants:- In recent years, recombinant DNA techniques combined with plant transformation and tissue culture methods paved the way for the genetic improvement of medicinal plants and its conservation. By targeted gene transfer to medicinal plants it is now possible to elevate the levels of specific secondary metabolites. In addition to the medical application, engineering of plant secondary metabolism may support the development of crop plants with improved nutritional traits and health promoting effects[1].

*T. Sandeep, Deepak Kumar, Gnana Prakash, M.O. Farooque and H.B. Nayaka.
Department of Biotechnology, Nacional Collage, Gandhi Nagar, Bellary - 583 103, Karnataka

Materials and methods

Chemicals used in the experiment were a) Nutrient agar medium, b) Nutrient broth medium and c) SDA medium. The plant materials collected from the gardens and outskirts of Bellary in Feb-06 were identified and confirmed with the help of authenticated books[3,4].

Micro-organisms

The bacteria (*Klebsiella pneumoniae, Staphylococcus aureus, Salmonella typhii, Proteus vulgaris, Pseudomonas aeruginosa* and *Escherichia coli*) and fungus (*Aspergillus fumigatus, Fusarium* sps and *Aspergillus niger*) were collected from the stock cultures of Microbiology Laboratory, Department of Microbiology, VIMS, Bellary. The bacterial and fungal pure cultures were maintained on nutrient agar and SDA agar medium respectively, and were stored at 4°C, for determining antimicrobial activity.

Preparation of extracts

The plant part (leaves) was dried and chopped into small pieces with a blender. For alcoholic extracts, 10g of dried leaf powder was weighed and extracted with 200 ml of solvent (ethanol) through Soxhlet extractor until the extraction solvent becomes colorless[4]. The alcoholic macerates were evaporated in a dessicator for 24 hrs. Then the evaporated macerates were used for antimicrobial activity determination.

Antimicrobial activity

The antimicrobial activity of different plant species was evaluated by agar well diffusion method. Agar cultures of the test micro-organisms were prepared as described by Navarro *et al*, (1966). For screening, the plant extracts with different concentrations i.e. 40mg/2ml, 60mg/2ml and 80mg/2ml were prepared; but only 0.2ml of the drug from each concentration was loaded into each 6mm diameter well (i.e. 4mg/0.2ml, 6mg/0.2ml and 8mg/0.2ml) of the inoculated agar medium. The plates were incubated for 18 hrs at 37°C for bacterial species and 48 hrs at 37°C for fungal species. Clear zones of inhibition around the wells indicated antimicrobial activity. Streptomycin (20mg/5ml)

TABLE 1

Antimicrobial activity of ethanolic extracts of *Tagetes erecta* Linn.

Micro-organisms	Control[1]	Alcoholic extracts (mm)			Streptomycin (800µg/0.2ml)
		4 mg/0.2ml	6 mg/0.2ml	8 mg/0.2ml	
Klebsiella pneumoniae	-	7.0 ± 1.00*	7.5 ± 0.00*	9.0 ± 1.00*	9.31 ± 1.97
Staphylococcus aureus	-	6.5 ± 0.50	7.25 ± 0.25	8.5 ± 1.11*	11.80 ± 2.39
Salmonella typhii	-	7.25 ± 1.03*	7.50 ± 1.50*	8.0 ± 2.00*	8.10 ± 0.62
Proteus vulgaris	-	7.0 ± .050	7.50 ± 0.80	9.0 ± 0.50*	9.25 ± 0.67
Pseudomonas aeruginosa	-	8.25 ± 0.87	8.75 ± 0.42	9.0 ± 0.95*	10.0 ± 0.0
Escherichia coli	-	7.25 ± 1.08	7.75 ± 0.66*	8.25 ± 0.75*	11.25 ± 2.10
Aspergillus fumigatus	-	7.25 ± 0.30*	8.75 ± 0.25*	9.25 ± 0.25*	10.60 ± 2.75
Fusarium	-	6.0 ± 0.50	7.0 ± 1.0	7.50 ± 0.50	12.18 ± 0.55
Aspergillus niger	-	8.0 ± 1.0	8.5 ± 1.17	8.75 ± 0.25	11.25 ± 0.86

1. Control - 0.2 ml of distilled water; * Significant values at P <0.05 (t-test)

was used as the standard control for micro-organisms. Each experiment was repeated thrice and the obtained results were analysed statistically with the help of mean, standard deviation, and also the student-t-test (performed at 5% level of significance)[5].

Results and discussion

Both the plant extracts were found effective against the different pathogenic micro-organisms. The different concentrations i.e. 4mg, 6mg and 8mg/0.2 ml of the extract of *Tagetes erecta* Linn. showed potent antimicrobial activity, and significantly inhibited the growth rate of various micro-organisms (Table 1).

The two concentrations i.e. 6mg and 8mg/0.2 ml and one concentration i.e. 8mg/0.2 ml of the extract of *Argemone mexicana* Linn. showed potent antimicrobial activity and considerably inhibited the growth rate of *Klebsiella pneumoniae*, *Proteus vulgaris* and *Pseudomonas aeruginosa* respectively. The three concentrations i.e. 4mg, 6mg, 8mg/0.2 ml of the extract did not show any potent antimicrobial activity and also failed to inhibit the growth rate of various micro-organisms like *Staphylococcus aureus, Fusarium* sps and *Aspergillus niger.* But *Salmonella typhii, Escherichia coli* and *Aspergillus fumigatus* showed resistance in all the three concentrations of *Argemone mexicana* Linn. (Table-2)

Conclusion

The extract of *Tagetes erecta* Linn. proved to be very effective against the pathogenic microorganisms when compared to *Argemone mexicana* Linn. Therefore investigation on *Tagetes erecta* Linn for the isolation of bioactive compounds responsible for antimicrobial activity and evaluation at its molecular level is necessary. It can be used as a chief ingredient in the preparations of clinical products to treat microbial diseases.

Acknowledgement

The authors are very much grateful to Mr. Prathap Reddy. N. and Mr. Jangama Reddy. K.,

TABLE 2

Antimicrobial activity of ethanolic extracts of *Argemone mexicana* Linn.

Micro-organisms	Control[1]	Alcoholic extracts (mm)			Streptomycin (800µg/0.2ml)
		4 mg/0.2ml	6 mg/0.2ml	8 mg/0.2ml	
Klebsiella pneumoniae	-	5.0 ± 0.5	6.50 ± 0.50*	7.50 ± 0.0*	9.31 ± 1.97
Staphylococcus aureus	-	5.0 ± 0.43	6.0 ± 0.50	6.5 ± 0.28	11.80 ± 2.39
Salmonella typhii	-	-	-	-	8.10 ± 0.62
Proteus vulgaris	-	5.0 ± 0.54	6.5 ± 0.12	8.25 ± 0.43*	9.25 ± 0.67
Pseudomonas aeruginosa	-	5.0 ± 0.14	7.0 ± 1.17	9.0 ± 1.00*	10.0 ± 0.0
Escherichia coli	-	-	-	-	11.25 ± 2.10
Aspergillus fumigatus	-	-	-	-	10.60 ± 2.75
Fusarium	-	7.0 ± 1.00	8.0 ± 0.30	9.0 ± 0.50	12.18 ± 0.55
Aspergillus niger	-	5.5 ± 0.14	7.0 ± 0.28	9.5 ± 0.25	11.25 ± 0.86

1. Control - 0.2 ml of distilled water; * Significant values at P <0.05 (t-test)

the Trust members of National College, Gandhi Nagar, Bellary, for providing proper facilities to carry out the research work.

References

1. Karin Springob and Kazuki Saito., Metabolic Engineering of plants secondary metabolism., *Science and Culture*., 68: pp 76-77, 2002.
2. Kurian, J.C., *Plants That Heal*, 2nd Edn., Oriental Watchman Publishing House, P 37, 55, 264, 300, 2001.
3. Cecil J. Saldanha and Dan H. Nicolson, *Flora of Hassan District, Karnataka, India*, Amerind Publishing Company Private Limited, New Delhi, 1978.
4. Hiremath, S.P., Swamy H.K.S., Shrishailappa Badami and Meena, S., Antibacterial and Antifungal activities of *Striga densiflora* and *Striga orobanchioides.*, *Indian J of Pharmaceutical sciences*., pp174 - 176, 1996.
5. Ramakrishnan, P., *Text Book of Biostatistics*, 1st Edn., SARAS Publications., 88, 124, P 253., 2003.

Aryavaidyan Vol. XXI., No. 3, Feb. - Apr. 2008, Pages 175 - 178

STANDARDISATION OF PAÑCAGAVYAM

Saraswathy Pasupathy, G.Venkateshwarlu, and K.Gopakumar*.

Abstract: Pañcagavya, viz. gokṣīra, goghṛta, godadhi, gomūtra, and gomayam, individually or collectively, have important therapeutic properties. It has been referred to in almost all āyurvedic classics. This paper briefly deals with the standardisation of pañcagavyam.

Introduction

There are detailed references to pañcagavyam (cow's five essential by-products) in āyurveda; each has its own distinct qualities and uses in health, agriculture and other fields like mantra, tantra and pūjāvidhis (sacrificial offerings). The pañcagavya substances are extensively used in the treatment of several disorders such as kāmalā (jaundice), jvara (fever), apasmāra (epilepsy) and unmāda (psychosis)[1]. They are also indicated in cāturthakajvara (tertian fever), grahadoṣa (obsession of evil spirits), unmāda (psychosis) and apasmāra (epilepsy)[2]. It is prescribed in the management of śvitra (leucoderma), medoroga (hyperlipidemia), vātarakta (arthritis), mūtrāśayagatarogas (renal disorders) and amḷapitta (acidity)[3].

A good number of formulations described in āyurveda contain the blend of cow's by-products. The compound formulations Pañcagavya ghṛta and Mahāpañcagavya ghṛta being made out of the cow's five by-products added with herbs like *Emblica officinalis*, *Glycyrrhiza glabra*, etc. have the neuro pharmacological and sedative actions (Ray Sebastian *et.al*) in addition to the hepatoprotective activity against the carbon tetrachloride induced hepatotoxicity in rats (Achilya, G.S *et al*.). Pañcagavya is referred to in the Rasaśāstra texts (metallurgy in āyurveda) also as being used extensively in detoxification and to enhance the therapeutical action of the metallo-mineral formulations.

Patent has been granted to Indian Scientists on the use of cow's urine distillate as bio-enhancer. The 'monocaprin' contained in milk and milk-products is reported to possess excellent microbicidal properties and useful against transmitted diseases in humans.

Materials and methods

Cow's milk, urine and dung were procured fresh from a nearby cow shed and the chemical analysis was carried out immediately after the collection. Curd and ghee were prepared from cow's milk in the laboratory of R.R.I. Chemical

**Regional Research Institute (Ayurveda), Jayanagar, Bangalore - 560011*

analysis for all the five samples were carried out according to Morris B. Jacobs[4] and Indian Pharmacopoeia[1]. The organoleptic characters of pañcagavya are detailed in Table 1.

Milk

Milk is one of the most important foods considered as samīkṛtāhāra (completely balanced and nutritive) in the human diet. It has many components which are highly essential for the health. It is recommended as a complete food for both infants and adults. Milk contains protective substances which tend to inhibit the deposition of cholesterol in arterial wall and contribute to the resistance of the arterial wall against the degenerative diseases. It contains large proportion of calcium phosphate, an important salt required for the formation of bones, and also for the proper coagulibility of the blood. Intake of milk removes tiredness, giddiness and cough. The inorganic constituents of milk are gases as carbon dioxide, nitrogen and oxygen, and mineral salts as compounds of calcium, potassium, sodium, carbon dioxide, phosphorus and iron.

Literature review shows that milk contains casein 2.86%, protein 3.77%, lacto albumin 0.70% and vitamin C 0.028 mg/ml[4]. The results of the chemical analysis of the fresh cow's milk are detailed under:

- Water 86.2%
- Total solids 12.5%
- Ash content 0.74%
- Acidity 0.15%
- Sugar 4.5%
- Fat 4.45%
- Solids non fat 8.77%
- pH 6.5
- Specific gravity at room temp. 1.029

Ghee

Cow's ghee has a higher digestibility than other animal and vegetable fats and the rate of adsorption is superior to that of hydrogenated fats. It is stomachic, nutrient, tonic and improves memory. It is cooling and increases the fat tissues and mental power and improves the voice, beauty and complexion. Ghee is rejuvenating and has pleasant smell and taste.

The sample of pure cow ghee was prepared in the laboratory and the standard parameters evaluated as follows:

- Loss on drying 0.15%
- Ash content 0,10%
- Acid insoluble ash 0.0009%
- Fat content 99.83%
- Saponification value 222.91
- Iodine value 34.6
- Specific gravity at room temp. 0.935
- Acid value 2.52
- Refractive index 1.456
- Un-saponifiable matter 0.31

TABLE 1
Organoleptic characters of pancagavyam

Parameter	Milk	Ghee	Curd	Urine	Dung
Colour	Yellowish white	Yellow	White	Straw yellow	Brown
Odour	Pleasant	Pleasant	Pleasant	Bad	Bad
Touch	Viscous than water	Oily	Faint oily	Watery	Sticky
Taste	Sweet and faint alkaline	Slightly sweet	Sour and astringent	Bitter	

Curd

Flavour, body consistency and non formation of whey are the important properties of good curd. Cow's curd is sweet and sour, sacred and good for health with nourishing, kindles digestive fires and best among all kinds of curds of other animals. It relieves vāta, produces marrow and blood. It is given with pomegranate bark in diarrhoea and dysentery in children. Curd is also good for meat eaters in whom proteolytic coli predominates.

Curd was prepared in the laboratory from cow's milk and the analysis was conducted on the same day and the following parameters observed:

- Loss on drying 87.78%
- Ash content 0.75%
- Acid in soluble ash negligible
- Total solids 12.22%
- Fat content 4.0%
- Carbohydrates 3.0%
- Minerals 0.8%
- pH 4
- Specific gravity at room temp. 1.03

Urine

It is lightly yellowish and alleviates doṣas. It is pungent, alkaline and bitter in taste and easily digestible and contains ammonia in a concentrated form and used both internally and externally. Cow's urine is bactericidal and cures jaundice, leprosy, abdominal pain, tumour and opthalmic diseases. Since it is laxative and diuretic, it is used in the preparation of various medicines. Cakradatta recommends it as a vehicle for purgative drugs. It is also used extensively in the purification and roasting of various metals, minerals and plants and in the preparation of compound formulations. Fresh cow's urine was collected, analysed and the results are shown below:

- Loss on drying 98.88%
- Ash content 0.37%
- Acid insoluble ash negligible
- Total solids 1.12%
- Organic matter 78.84%
- Nitrogen 10.6%
- Potash 7.2%
- pH 8.2
- Specific gravity at room temp. 1.0482
- Qualitative analysis of the ash *

Dung

It is rich in organic matter and nitrogen. When it is fermented in an anaerobic condition produces a combustible gas containing about 60% methane, 10% hydrogen, and 30% carbon dioxide and it is called 'gober gas'. Juice of the fresh dung is used for bleeding diseases. Chemical analysis was carried out on the fresh sample and the following parameters observed:

- Loss on drying 83.19%
- Ash content 2.37%
- Acid insoluble ash 1.3%
- Total solids 16.81%
- Organic matter 80.0%
- Nitrogen 1.23%
- Potash 0.75%
- Qualitative analysis of the ash *

Fresh cow dung was squeezed through cotton cloth and the juice was also standardised and the following values observed:

- Loss on drying 94.02%
- Ash content 1.52%
- Acid insoluble ash 0.44%
- Total solids 5.98%
- pH 8.1
- Specific gravity at room temp. 1.094

*Presence of sulphate, chloride, phosphate, potassium, traces of iron and calcium

Results and discussion

Besides its therapeutic properties, pañcagavya products have excellent agricultural applications. They are excellent pesticide, insect repellent and bio-dynamic composites. It is economic and has miraculous effect on crops in increasing the size, taste and yield. Hence, the pañcagavya products were standardised by procuring the authentic samples, and the results are provided to enhance the Āyurvedic Pharmacopoeia.

Acknowledgement

The authors are thankful to the Director, CCRAS, New Delhi for financial support and to Dr.Shantha in helping to procure the authentic samples, and to Shri.Shekara for technical assistance.

Bibliography

1. Anonymous, *Pharmacopoeia of India*, 2nd edition, Govt of India, New Delhi,1996.
2. Cakrapani Dutta, *Chakradatta*, Choukamba Sanskrit Sansthan Varanasi, 3rd Edition, 1997
3. Govinda Das, *Bhaisajyaratnavali*, Choukamba Sanskrit Sansthan,14th Edn., 2001
4. Morris B. Jacob, The chemical analysis of food and food products, 3rd edition, CSB products, Daryaganj New Delhi, 1999
5. Sadananda Sharma, *Rasatarangini*, 11th Edn., Motilal Banarasidas Varanasi, 1979
6. Sastry J.L.N., *Dravyaguna Vijnana*, Vol. 1. 1st Edn., Chaukhamba Oriantalia , Varanasi, 2002.
7. Sharma, R.K. and Bhagavan Das, *Carakasamhitha*, 7th Edn., Vol. 1, Chaukhamba press, Varanasi, 2002
8. Dr. Anna Moreshwar Kunte, *Ashtangahridayam*, 8th Edn., Chaukhamba Orientalia Varanasi, 1998.
9. Vd.Yadavji &Trikamji, *Susrutasamhitha* with Nibandha Sangraha commentary, 6th Edn., Chaukhamba Orientalia, Varanasi, 1997.
10. Nadkami, K.M., *Indian Materia Medica*, 3rd Edn., Vol. 2, Popular Prakahan Private Ltd, Bombay, P 232, 1976.
11. Srikanthamurthy, K.R., Bhavaprakasa, Vol. 1, Chaukamba Krishnadas Acadamy Varanasi, pp 462-470, 2004.

References

1. Astangahrdayam, Uttrasthanam, 7/18
2. Chakradattam, 21/16
3. Carakasamhita, Susrutasamhitha and Bhaisajyaratnavali
4. Morris B. Jacobs, 3rd edition, 1999

Aryavaidyan Vol. XXI., No.3, Feb. - Apr. 2008, Pages 179 - 183

NEPHRO-PROTECTIVE EFFECT OF *WITHANIA COAGULANS* AND *HIBISCUS SABDARIFFA* IN TYPE 2 DM WITH SPECIAL REFERENCE TO MICROALBUMINURIA

M.H. Hakim, M.Y. Siddiqui and Aftab Alam*

Abstract: Microalbuminuria is defined by a rise in urinary albumin loss to between 30 and 300 mg/day. This is the earliest sign of diabetic nephropathy and is the beginning of morbidity and end stage renal failure. Considering the high prevalence of type 2 diabetes mellitus, it's debilitating end organ damage and the side effects of chemical drugs used for it's treatment, this clinical study was conducted to evaluate the effect of herbal drugs i.e. *Withania coagulans* and *Hibiscus sabdariffa* on type 2 DM with microalbuminuria. 15 patients of type 2 DM who had microalbuminuria were included in the study. The duration of study was 6 months. The results were somewhat encouraging.

Introduction

Diabetic nephropathy is the leading cause of end stage renal disease (ESRD) and a leading cause of diabetes-mellitus-related morbidity and mortality. There is an alarming increase in the incidence of type 2 DM in India recently and it has been estimated that India, with more than 32 million diabetes patients, would have in 2030, a whopping 80 million diabetics[1]. ESRD would be a great problem.

Proteinuria in individuals with DM is associated with markedly reduced survival rate with increased risk of cardiovascular disease. Individuals with diabetic nephropathy almost always have diabetic retinopathy also "the leading cause of preventable blindness". Mechanisms by which chronic hyperglycemia leads to ESRD, though incompletely defined, involve the following: interaction of soluble factors (growth factors, angiotensin II, endothelin, AGEs), hemodynamic alterations in the renal microcirculation (glomerular hyperfiltration, increased glomerular capillary pressure), and structural changes in the glomerulus (increased extracellular matrix, basement membrane thickening, mesangial expansion, fibrosis). Some of these effects may be mediated through angiotensin receptors. Smoking accelerates the decline in renal function. The natural history of diabetic nephropathy has a fair predictable pattern although this sequence of events is defined by individuals with type 1 DM, a similar pattern is likely in type 2 DM. Glomerular hyperfusion and

**Department of Moalijat, Ajmal Khan Tibbiya College, Aligarh Muslim University, Aligarh, 202002*

renal hypertrophy occur in the first year after the onset of DM and are reflected by an increased glomerular filtration rate (GFR). During the first 5 years of DM, thickening of the glomerular basement membrane, glomerular hypertrophy and mesangial volume expansion occur as the GFR returns to normal. After 5 to 10 years of type 2 DM, 40% of individuals begin to excrete small amounts of albumin in the urine (microalbuminuria). Microalbuminuria is defined as 30 to 300 mg/d in a 24-h collection or 30 to 300 Ilg/mg creatinine in a spot collection. The appearance of microalbuminuria is a very important predictor of progression to overt proteinuria (300 mg/d). After that, there is a steady decline in GFR and 50% of individuals reach ESRD in 7 to 10 years. The early pathogenic changes and albumin excretion abnormalities are reversible with normalisation of plasma glucose. However, in type 2 DM microalbuminuria will be less predictive of progression to overt nephropathy. It should be noted that albuminuria and type 2 DM may be secondary to factors unrelated to DM, such as hypertension, congestive heart failure, prostate disease or infection[2].

As the microalbuminuria usually proceeds to macroalbuminuria by an intervals of 5 to 10 years, it's early detection and proper management in type 2 DM is likely to stop or delay deterioration in renal function and ESRD. Large clinical trials have demonstrated that achieving tight glycemic control (i.e. glycosylated haemoglobin <7%) retards the progression of renal disease. There is accumulating evidence to suggest that the use of antihypertensive agents which targets the rennin angiotensin system (RAS) can slow the progression of renal disease and microalbuminuria[3].

In the light of above etiopathogenesis, we decided to carry out the clinical trial of herbal antidiabetic drug along with herbal antihypertensive drug having ACE inhibitor-like activity in type 2 DM patients having microalbuminuria. For this purpose the drugs *Withania coagulans* and *Hibiscus sabdariffa* were chosen for antidiabetic and ACE inhibitor-like activity respectively.

Materials and method

This study was carried out in patients attending the medical OPDs of Ajmal Khan Tibbiya College hospital, Aligarh Muslim University, Aligarh during the period from 2004-2006. Only those patients of type 2 DM was included in the study who had microalbuminuria. The patients suffering from hypertension, congestive heart failure, prostate disease and infection were excluded from the study. Patients who had neither taken any antidiabetic treatment of any system of medicine or left or defaulted, and those who had stopped taking allopathic drugs for at least 5 years were included in this study. Before starting the trial, approval from ethics committee and informed written consent was taken from all the patients. The diagnosis of type 2 DM was made by according to the criteria laid down by WHO (Table 1&2)

The diagnosis of microalbuminuria was made by dipstick test using Micral dipstick as per the guidelines of Nephrology section of department

TABLE 1

Distribution of patients according to sex and age

No. of subjects studied		15	100%
Male: Female		8:7	53.3%:46.7%
Age in years	- 40 - 50	6	40%
	- 50 - 60	9	60%

of Medicine, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh. In all the patients' clinical history, physical examination, routine investigations, ECG and X-ray was carried out. The drugs *Withania coagulans* and *Hibiscus sabdariffa* were given for 6 months duration of the study. The experimental procedure consisted of the administration of the decant 150 ml water of 10 seeds of *Withania coagulans* and 6 gram of dry calyx from *Hibiscus sabdariffa* twice a day in 15 patients of type 2 DM, in which microalbuminuria was also present. Random blood sugar, blood urea, serum creatinine, complete urine examination and test for microalbuminuria were carried out at monthly interval for 6 months. Glycosylated haemoglobin was estimated before and at the end of trial.

TABLE 2

Criteria for the diagnosis of Diabetes Mellitus

- Symptoms of diabetes plus random blood glucose concentration > 11.1mmol/l (200 mg/dl)[1] or
- Fasting plasma glucose > 7.0 mmol/l (126 mg/dl)[2] or
- Two-hour plasma glucose > 11.1 mmol/l (200 mg/dl) during an oral glucosetolerance test[3]

In the absence of unequivocal hyperglycaemia and acute metabolic decompensation, these criteria should be confirmed by repeat testing on a different day.

1 Random is defined as without regard to time since the last meal.
2 Fasting is defined as no caloric intake for at least eight hours.
3 The test should be performed using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water; not recommended for routine clinical use.

Observations and results

Results showed that the experimental treatment decreased the blood pressure (BP) from 146.48/97.77 to 129.89/85.96 mmHg reaching an absolute reduction of 17.14/11.97 mmHg[5].

The mean random blood sugar which was 254 mg% before the experimental treatment is reduced at the end of 6 months treatment to 176 mg% with a fall of 30.7% while glycosylated haemogliobin decreased by 9.5% from 8.5% to 7.7%. All the 15 patients had microalbuminuria which disappeared in 5 patients after the 6 months showing a fall of 33.33% (Tables 3&4). These effects may be explained as follows.

The hypoglycaemic effect of *Withania coagulans* observed in our study is supported by the earlier studies carried out by Kalam A[6] and Hemalatha *et al*[7]. It may be one of the reasons by which the microalbuminuria disappeared in 5 patients out of 15 patients, because optimal or near normal glycaemic control inhibits the tendency of micro albuminuria itself. Probably because of this effect the level of glcosylated haemoglobin also decreased from 8.5% to 7.7%, which was however still above normal. The other reason due to which microalbuminuria disappeared may be ACE inhibition activity of *Hibiscus sabdariffa* which exerted antihy-pertensive effect[8-10]. The flavonoides delphini-din and cyanidin present in *Hibiscus sabdariffa* shows inhibitory activity on the enzymes ACE, elastase, trypsin and chymotrypsin *in-vitro* and blood vessels protection activity of delphinidin and cyanidin called anthocyans *in-vivo*. Both the fractions of anthocyans inhibit elastase as well as trypsin and chymotrypsin to a lesser degree[11]. (Fig. I)

In brief, it was the near normal glycaemic control,

TABLE 3

Effect on random blood sugar (mg%) and glycosylated haemoglobin (%)

Parameter	0 day	1 month	2 months	3 months	4 months	5 months	6 months
RBS (Mean + SD)	254.8 + 26.8	240.2 + 23.4	234.5 + 31.8	213.1 + 24.8	198.2 + 29.1	195.3 + 23.5	176.5 + 24.3
Percentage of fall	-	5.7%	7.9%	16.4%	22.3%	23.4%	30.7%
HbAlc (Mean+SD)	8.5 + 0.62	-	-	-	-	-	7.7 + 0.79
Percentage of fall	-	-	-	-	-	-	9.5%

decreased HbAlc and ACE inhibitor-like activity of *Hibiscus sabdariffa* that resulted in disappearance of microalbuminuria in some patients. If detected and managed early either by antidiabetic agents and/or in combination with ACE inhibitor, significantly reduces the future renal complication and ESRD. For the same reason ACE inhibitors in modem medicine play a key role in ameliorating or controlling microalbuminuria with suitable antidiabetic drugs.

Discussion

Withania coagulans has been used as antidiabetic agent in India as a folk medicine; however, as a standard drug it was probably used by Hakim Kabiruddin in mid 20th century[4]. Apart from other Unani, drugs, it has achieved a prime status in the management of mild to moderate type 2 DM and has a significant hypoglycaemic effect. Much attention has been paid to the microalbuminuria in the recent times in either type of diabetes. It is so because if albumin present in urine even in smaller quantity however within the range of microalbuminuria, it has a significant prognostic as well as diagnostic importance.

Hibiscus sabdariffa has been used in different countries as an antihypertensive agent. Pharmacological works have been demonstrated that this effect is produced by diuretic activity and inhibition of angiotensin converting enzyme.

TABLE 4

Effect on Microalbuminuria

	MONTHS						
	0	1	2	3	4	5	6
N.P.	15	15	15	15	12	10	10
N.P.I.	0	0	0	0	3	5	5
P.I.	-	-	-	-	20	33.3	33.3

N.P. = No. of Patients; N.P.I. = No. of patients improved; P.I. Percentage of improvement

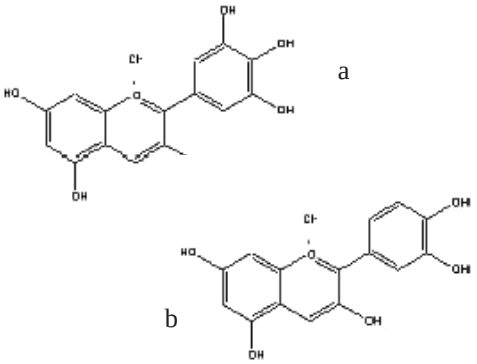


Fig. I. a. Delphinidin; b. Cyanidin

References:

1. Rao B.N.P., Kumar, D.R.A., Kulkarni, K.R., Bhatavadekar, P.D. and Nagabhushan, K.H., Audio Vestibular Functions in Diabetic Patients, *Indian Medical Gazette*, CX XXIX (10), P 418, 2005.
2. Powers, A.C., Diabetes Mellitus, *Harrison's Principles of Internal Medicine*, Vol. 2, 15th edition, edited by Braunwald E, Fauci A.S., Kasper, D.L., Hauser, S.L., Longo, D.L. and Jameson, J.L., (The Mc Graw-hill Companies, Inc., US), pp 2121-22.
3. Jermus, G. and Maclsaac, R.J., Treatments of microalbuminuria in patients with type 2 diabetes mellitus, *Treatments in Endocrinology*, 1 (3) pp 163-173, 2002.
4. Kabiruddin, M., *Makhzan-ul-Mufradat*, (Year of Publication and Name of Publisher not known), pp 181-182.
5. Herrera-Arellano, A., Miranda-Sanchez, J., Avila-Castro, P., Herrera-Alvarez, S., Jimenez Ferrer, J.E., Zamilpa, A., Roman-Ramos, R., Ponce-Monter, H. and Tortoriello, J., Clinical effects produced by a standard herbal medical product of *Hibiscus sabdariffa* on patients with hypertension, A randomized, Double blind, lisinopril-controlled clinical trial, *Planta Med*, 73 (1), pp 6-12, 2007.
6. Kalam, A., *Ziyabitus Shakari per Tukhm-e-Hayat key Asarat ka Tahquiquee Mutala* (MD Moalijat), Thesis, Department of Moalijat, Faculty of Unani Medicine, Aligarh Muslim University, Aligarh, 1996.
7. Hemalatha, S., Wahi, A. K., Singh, P.N. and Chansouria, J.P.N., Hypoglycemic Activity of *Withania coagulans* Dunal in Streptozotocin Induced Diabetic Rats, *Journal of Ethnopharmacology*, 93 (2-3), P 261, 2004.
8. Herrera-Arellano, A., Flores-Romero, S., Chavez-Soto, M.A. and Tortoriello, J., Effectiveness and tolerability of a standard extract from *Hibiscus sabdariffa* in patients with mild to moderate hypertension: A controlled and randomized clinical trial, *Phytomedicine*, 11(5), pp 375-382, 2004.
9. Ahmad, S., Mannan, A. and Sherani, F.S., Herbal management of Hypertension - An integral approach, *Unimed.*, 1(2), P 36, 2006.
10. Haji Faraji, M. and Haji Tar Khani, A., The effect of sour tea (*Hibiscus sabdariffa*) on essential hypertension, *J. Ethnopharmacol*, 65(3), pp 231-236, 1999.
11. Jonadet, M., Activities inhibitrices enzymatiques in vitro et angioprotective in vivo d'extraits de karkade (*Hibiscus sabdariffa*) *J. Pharm Belg*. 45(2), pp120-124, 1990.

Aryavaidyan Vol. XXI., No.3, Feb. - Apr. 2008, Pages 184 - 186

STANDARDISATION METHODS OF ADULTERATED DRUGS

Shraddha Umesh Nayak*

Abstract: Most of the medicines in āyurveda are plant-based. The crude drugs used to prepare the medicines are usually collected from the local markets. These drugs are generally adulterated or substituted. This may affect the clinical efficacy. The present article throws light on adulteration and examples of few scientific tests to detect adulteration.

Introduction

Plant-based medicine is still the mainstay of about 75-85% of the world population. The last few years have seen a major increase in their use in the developed world. There is a great demand for herbal drugs in the global market. But there they are posed with the problem of standardisation. Also it is evident that the market of medicinal herbs is flooded with spurious substitutes and adulterants. So standardisation in this regard is utmost necessary.

In Pharmacognostical language 'standardisation' signifies the body of information and control that are necessary to guarantee consistency of composition, hence the standardised quality of a phyto-pharmaceutical drug[1]. Our ācāryas were very cautious about the standard of drugs. Caraka and Vāgbhaṭa describe[a] four qualities of a drug which stress the importance of standardisation of drugs[2,3]. These descriptions have importance in the context of G.M.P. and quality control. Like quality control, references can be seen in our classics which reflect 'adulteration' for the purpose of commerce that was in practice since ancient times. For example, sphaṭikamaṇi was processed to look like padmarāga; bilvakāṣṭha for candana and kaṅkolatvak for lavaṅga[b].

The quality control was restricted from the very earlier time, and severe punishment was enforced on traders who violated the restriction. In vyavahārādhyāya of Yāgñavalkya, it has been stated that merchants would be charged 16 paṇa if they sold inferior quality of bheṣaja, sneha, etc.[c]

Adulteration is defined as a practice of substituting original crude drug partially or wholly with other similar looking substance but the latter is either free from or inferior in chemical and therapeutic properties.

Causes

The important four causes of adulteration are: i. feeble description of drugs in the classics, ii. interference of agents or dependence on a third person for supply of drugs, iii. Added contro-

Lecturer, Department of Dravyaguna, Dr. D. Y. Patil college of Ayurveda and Research, Mumbai

Adulterants and distinguishing tests

TABLE 1

Drug	Part used	Adulterant	Distinguishing tests
Hiṅgu (Asafoetida)	Gum	Colophony, Gum, Foreign resins	1. Pure hiṅgu when dissolved in water produce milky solution 2. Burns with yellow bright flame
Marica (Black pepper)	Fruit	Dried seeds of papaya	Papaya seeds when put in a glass of water float on top
Hṛtpatrī (Digitalis)	Leaf	Erbascum thapsus	Microscopically by the presence of large wooly branched trichomes
Lavaṅga (Clove)	Flower	Clovestalk	Presence of Calcium oxalate prisms and large thick walled cells
Jātīphala (Nutmeg)	Seeds	Imitation of nutmeg made by moulding the exhausted powder and flavouring	Put in water imitation breakes down quickly
Tvak (Cinnamon)	Bark	Jungle cinnamon	Dark colour, less aromatic and slightly bigger
Śuṇṭhi (Ginger)	Underground drugs	Exhausted ginger	Determination of water-soluble ash, alcohol & water-soluble extractives
Bees wax	Lipids and volatile oils	Paraffin, Stearic acid	Solubility, melting points, saponification cloud test with alkali is not effective

TABLE 2

Descriptions/Drugs	Adulterant	Distinguishing tests
1. Exomorphology:		
Clove	Clove fruit	Distinctively longer ovate and tapers below
Aśvagandhā (root)	Wild variety	Roots are thicker, curved or vary in shape, have reddish brown easily separable bark which is upto 3 mm thick, fracture fibrous in bark region
2. Microscopic evaluation:		
Clove	Clove stalk	Presence of calcium oxalate prisms and large thick walled stone cells
Sandal	Saptaparṇa is debarked, smeared with oil dipped in colour water	On Cross section latex globule is seen while in sandal oil globule is seen
3. Chemical test:		
Clove	Fruit	Presence of starch
Hiṅgu	Other gums/foreign resins	Combined Umbelliferron test- A blue florescence produced
Dattūra	Datura inoxia	Vitali Morin Reaction - violet colour is observed

versies by Nighaṇṭus and iv. ignorance of botanical knowledge

Types

The types of adulterants include:

- Substitution with -
  - substandard commercial varieties
  - superficially similar inferior drugs
  - artificially manufactured drugs
  - exhausted drugs
  - synthetic chemicals
- Presence of vegetative matter from the same plant
- Harmful adulterants
- Adulteration of powders

Solution

There are some solutions to curb the problem of adulteration which include:

- Identification of drug as per ICBN
- Maintaining a central medicinal plant herbarium
- Cultivation of plants
- Proper collection, preservation and storage of samples
- Other scientific methods of standardisation i.e. organoleptic, phytochemical analysis are to be done to bring about consistency.

Interestingly, we find references of testing genuine drugs persisting even in the classics. Rājanighaṇṭukāra has mentioned certain organoleptic and physical tests to identify genuine kastūri[d]. Genuine kastūri is bitter and pungent in taste, piṅgaḷa varṇa, smells like ketakī, light in weight, doesn't spread when introduced in water and doesn't burn in fire[4]. Modern science has developed many tests to identify the genuine drugs (Tables 1&2).

Discussion

Adulteration is a major problem which needs immediate attention. According to Ācārya P.V. Sharma, if a drug is adulterated and randomly used the results are unpredictable[5]. So, we have to choose genuine drugs for better clinical efficacy.

Acknowledgement

I thank Prof. K. S. Jayshree, HOD of Department of Dravyaguna and Prof. Ashalata, Department of Dravyaguna, GAMC Bangalore, for guiding me through the article.

References

a. Carakasamhita, Sūtram 9
   Aṣṭāṅgahṛdayam, Sūtram 1/28
b. Mitakṣāra
c. Yāgñavalkya 20/245
d. R.N. Candanādi varga 53-54

Bibliography

1. Kokate C. K., Purohit A. P., Gokhale S. B., *Pharmacognosy*, Nirali Prakashan, Pune.
2. *Caraka samhita*, of Agnivesa, elaborated by Caraka and Dṛḍhabala, edited with Charaka Chandrika Hindi Commentary along with special deliberation by Dr. Brahmanad Tripathi, Chaukambha Surbharati Prakashan, Varanasi, 3 rd Edition 1994.
3. Vāgbhaṭa, *Aṣṭāṅgahṛdaya*, Edited with the Vidyotini Hindu Commentary, by Kaviraja Atiridev Gupta, Chaukambha Sanskrit Sansthan, Varansi, 13th Edition, 2000.
4. Narahari Pandit, *Rajanighantu*, Edited by Indradev Tripathi, Krihnadas Academy, Varanasi, 1st Edition 1983.
5. Sharma P. V., *Dravyaguna Vijyan*, 5th Volume, Chaukambha Bharat Academy, Varanasi.

Aryavaidyan Vol. XXI., No. 3, Feb. - Apr. 2008, Pages 187 - 192

EXCERPTS FROM CIKITSĀMAÑJARI - LVII

P. Unnikrishnan*

Abstract: Care of the newborn, diseases of the infants and their treatments are explained in this issue.

TREATMENT OF BĀLA

Immediately after birth, the child's body should be smeared with a mixture of ghee and rock salt to clear the remnants of amniotic fluid, and thereafter irrigate with Balātaila to relieve pains caused as a result of birth. Breast milk of the mother is sufficient for the development of the body, but in the absence of mother's milk, goat's milk or cow's milk can be given. Placing of a small quantity of butter on the head can relieve fever; it also wards off evil spirits. Fresh butter mixed with a fine paste of the following shall be placed on the head, hands and neck for the relief of fever caused by deranged pitta.

Bṛhati	*Solanum indicum*
Vacā	*Acorus calamus*
Rohaṇī	*Picrorhiza scrophulariiflora*

Application of a paste made out of kaṭurohiṇi (*Picrorhiza scrophulariiflora*) on the nipple of the mother at the time of breast feeding is advised. Butter prepared from medicated milk (with kaṣāya of kaṭurohiṇi) shall be fed for the relief of all fevers. Flatulence and constipation are relieved by consumption of butter mixed with the fine paste of āvaṇakkinver (root of *Ricinus communis*) in small dose.

Kaṭukka (*Terminalia chebula*) ground to a paste, on consumption in butter, relieves excretion of feces in pill-form or in green colour; this causes purging. On the next day, paste of cuṇdaver (*Solanum indicum*) shall be given with ghee. Koṭuttūva (*Tragia involucrata*) is also good for relieving diarrhea. Flatulence due to retention of urine is relieved by application of the central pith of ripe veḷḷari (*Cucumis sativus*) on the abdomen, including umbilical region. The seeds and pith of veḷḷari, ground to a paste in its juice can also be applied likewise. This is diuretic. Any medicine, which is given to children, should be mixed with butter. Reddish painful lesions on the skin (of agnivīsarpa) are relieved by local application of Śatadhauta ghṛta. Application of expressed juice of karuka (*Cynodon dactylon*) and muttiḷ (*Centella asiatica*) without roots is also effective. This combination mixed with ghee may be given orally. Application of juice of karuka with butter or butter alone on the head is advised. Plain water should not be used. Kaṣāya prepared with nellikka (*Emblica officinalis*), when cool, can be used for bathing. In agnivīsarpa, tender shoots of karuka and eḷḷu (*Sesamum indicum*)

*"Sivam" Vaidyaratnam Road, Nayadippara, Kottakkal-676 503

made to a paste in fresh milk can be applied locally. The following, ground to a paste in milk, on local application relieves visarpa in children.

Eḷḷu	*Sesamum indicum*
Karuka	*Cynodon dactylon*
Kāñjiraṭaḷir	*Strychnos nux-vomica*
Muttiḷ	*Centella asiatica*
Tūttal	Copper sulphate

The supernatant creamy layer of milk mixed with kāvimaṇṇu (red ochre) and butter, on local application relieves abscess. Dūrvāgra (*Cynodon dactylon*) and eḷḷu (*Sesamum indicum*) ground well may be applied with milk and butter on the pustules. Local application of a paste prepared from the following with butter and creamy layer of milk is also very effective.

Dūrvāgra	*Cynodon dactylon*
Eḷḷu	*Sesamum indicum*
Citṭamṛtu	*Tinospora cordifolia*
Śrītāḷivēr	*Ipomoea sepiaria*
Tumpappū	*Leucas aspera*

Application of eḷḷu (*Sesamum indicum*), karukanākku (*Cynodon dactylon*), tirutāḷi (*Ipomoea sepiaria*) and tumpappū (*Leucas aspera*) ground with fresh milk and butter is also effective.

Consumption of a paste of jīrakam (*Cuminum cyminum*) and ghee relieves abscess and also increases digestive power. To relieve constipation of infants, external application of a mixture of milk, ghee and sesame oil on the abdomen is prescribed. Castor oil mixed with breast milk is also effective. Application of kampippāla (*Mallotus philippensis*), ground to a paste in warm water, on the abdomen of the infant is advised.

Kunnikkuru (*Abrus precatorius*) ground to a paste in kāṭi (first washing of rice) applied on the abdomen relieves constipation. A paste prepared from the root of kūvaḷam (*Aegle marmelos*), applied on the nipple before feeding, clears vomiting and diarrhea. Application of the paste of jīraka on the nipple and feeding the child relieves vomiting and diarrhea.

Medicines prescribed for the diseases shall be applied on the nipple, retained for 48 minutes and then washed off; the infant is then fed with breast milk for the cure of diseases. Consumption of milk medicated with kaṣāya of vilva (*Aegle marmelos*) added with no-cake and honey relieves vomiting and diarrhea.

Prepare ardhakaṣāya (kaṣāya prepared with half its strength of solid and liquid components) with the root of vilva added with no-cake. Consumption of this medication relieves vomiting and diarrhea. Medicated ghee from the following relieves diarrhea. The dosage of this medicine has to be adjusted appropriately.

Muttaṅga	*Cyperus rotundus*
Cerukaṭalāṭi	*Cyathula prostrata*
Koṭuttūva vēr	*Tragia involucrata*
Jīrakam	*Cuminum cyminum*
Muttiḷ	*Centella asiatica*
Cuṇṭavēr	*Solanum indicum*

Milk or ghee medicated with the following relieves diarrhea.

Cūtaśalāka	*Mangifera indica* (shoot)
Mahauṣadha	*Zingiber officinale*
Mustā	*Cyperus rotundus*
Kūvaḷavēr	*Aegle marmelos*
Lāja	Parched rice (no-cake)
Yavāṣam	*Tragia involucrata*
Jīrakam	*Cuminum cyminum*

Expressed juice or kaṣāya prepared from the following, consumed with honey quickly relieves fever, vomiting, diarrhea, thirst and fainting in children.

Uśīra	*Vetiveria zizanioides*
Jambu	*Syzygium cumini*
Āmrapallava	*Mangifera indica* (tender leaf)
Vaṭapraroha	*Ficus benghalensis* (bud)

Pippali (*Piper longum*), powdered and mixed with honey, consumed in suitable doses relives cough associated with weight loss in children. Intake of fine paste of kūvaḷa (*Aegle marmelos*) mixed with honey or butter relieves cough and dyspnoea. Root of ceruvazhutina (*Solanum indicum*) can also be used as above. Prepare a kaṣāya from kūvaḷaver added with milk. The butter prepared from this on consumption relieves cough and breathing difficulties. It also increases appetite, relieves vomiting and hiccough. In the above preparation, kaṣāya prepared from ceṛupañcamūla (roots of *Desmodium gangeticum, Pseudarthria viscida, Solanum indicum, Solanum surattense* and *Tribulus terrestris*) can also be used.

Application of Śatadhauta ghṛta or Gopādmajādi ghee is effective for the relief of abscess. Medicated ghee prepared from the expressed juice of karuka (*Cynodon dactylon*) and parpaṭaka (*Hedyotis corymbosa*) as liquid component, and fine paste of yaṣṭīmadhu (*Glycyrrhiza glabra*) as solid component can also be applied locally. This is very effective for wounds and skin diseases. Local application of a paste prepared from iraṭṭimadhuram (*Glycyrrhiza glabra*) mixed with butter is effective. Application of fine paste of attittoli (*Ficus racemosa* - bark) and candanam (*Santalum album)* is also effective. To increase weight, application of butter mixed with expressed juice of kaṛuka is prescribed. Addition of uzhunnu (*Vigna mungo*) and kōlarakku (*Laccifer lacca*) to the above preparation also promotes weight gain.

Milk medicated with tender leaves of aśvatha (*Ficus religiosa*) relieves fever. Milk medicated with arayālkurunnu (*Ficus religiosa* - tender leaves) and a rice porridge prepared in it, on consumption (in the day time) relieves night fever. Kaṣāya prepared with arayālkkurunnu on consumption also relieves this type of fever.

Kaṣāya prepared from the following relieves fever in children.

Kṣudra	*Solanum surattense*
Śuṇṭhī	*Zingiber officinale*
Guḍūcī	*Tinospora cordifolia*
Pippala-pallavam	*Ficus religiosa* - tender leaves
Mustā	*Cyperus rotundus*
Parpaṭam	*Hedyotis corymbosa*

The above kaṣāya is good for all fevers in children. Ghee medicated with the expressed juice of the following shall be applied on the body below the level of neck.

Arayāl-kurunnu	*Ficus religiosa* (tender leaves)
Pālayila	*Alstonia scholaris*
Ceṛupanacci	*Diospyros malabarica*
Ciṫṫamṛtu	*Tinospora cordifolia*

Butter may be applied on the vertex. Medicated ghee prepared from the expressed juice of arayālkurunnu (*Ficus religiosa*) and ciṫṫamṛtu (*Tinospora cordifolia*) and kaṣāya of kōlarakku (*Laccifer lacca*) as liquid component, and fine powders of rāmaccam (*Vetiveria zizanioides*), kaṭukurohiṇi (*Picrorhiza scrophulariiflora*) and cuṇṭavēr (*Solanum indicum*) as solid component, on application on the body below neck relieves fever. Lākṣādi tailam is also effective. Rice porridge prepared with the kaṣāya of tumpappū (*Leucas aspera*) and milk relieves fever with tremor.

Vomiting and retention of urine is relieved by consumption of fine powders of ela (*Elettaria*

cardamomum) and śvadamṣṭrā (*Tribulus terrestris*) mixed with honey. Milk medicated with gokṣura (*Tribulus terrestris*) on consumption relieves retention of urine and vomiting.

Expressed juice of śatāvari (*Asparagus racemosus*) added with sugar is to be reduced in fire; when it is in the lickable form, add fine powders of ēlattari (*Elettaria cardamomum*) rock salt, tippali and ñeriñ̃il (*Tribulus terrestris*) and mixed well. Consumption of this medicine relieves dysuria.

Milk and ghee being the main food of infants, they suffer from diseases caused by increased kapha. Gain in weight, coated tongue and mild fluid stools, aversion to breast milk are seen in a disease called parappan. Expressed juice from the tender spongy portion of small tender coconut (mocciṅṅa) on consumption relieves ulcers of the mouth and salivation. Expressed juice from kañ̃ikūrkkila (*Plectranthus amboinius*) consumed with buttermilk relieves ulcers in the mouth.

Sesame oil medicated with the expressed juice of kañ̃ikūrkkila, nīli (*Indigofera tinctorea*), and karivēppu (*Murraya koenigii*) as liquid component and fine powders of jīraka, perumjīraka (*Foeniculum vulgare*), niśā (*Curcuma longa*) and yaṣṭī (*Glycyrrhiza glabra*) as solid component on consumption relieves dyspnoea and slimy salivation. All symptoms of parappan are also relieved by this.

Sesame oil prepared with the expressed juice of paccila (*Stachystarpheta indica*), indra (*Cardiospermum halicacabum*) and niśā as liquid component and fine powder of ēkanāyaka (*Salacia reticulata*) as solid component, on consumption in small quantity or extenal application, relieves parappan. Sesame oil medicated with the expressed juice of nīli, on external application relieves parappan. External application of oil known as purāṇadīpatilajam* relieves parappan. Application of a mixture of sesame oil and ghee on the body is also good for the above condition.

Ugrā (white, red or black coloured circular lesion on the skin, with or without itching) of white variety is relieved by consumption of veḷutta teccivēr (*Ixora coccinia*), cīracembanvēr (root of a variety of paddy) and kuruṇāśiphā (*Mucuna pruriens*) in raw buttermilk. Ugrā of the white variety is cured by consumption of ñāṛaltōl (*Syzygium cumini* - bark) in raw buttermilk. Ugrā of the red variety is cured by consumption of nellittōl (*Emblica officinalis* - bark) in raw buttermilk. For the black variety, the above two are useful. Ghee medicated with paccamañ̃ñaḷ, puḷiyāral, tṛttuvā, etc. (cross ref. Jvaracikitsa, 201) is also effective.

Buttermilk medicated with nellikka, teccivērintōl (*Ixora coccinia* - root bark), dusparśā (*Tragia involucrata*), ayamōdakam (*Trachyspermum roxburghianum*) and jīrakam relieves ulcers of the stomach. Consumption of ghee medicated with the bark of vēppu (*Azadirachta indica*) is also effective.

Consumption of the fine paste of the following in raw buttermilk promotes digestion. Ulcers of the stomach, cough, stomachache and fever are also relieved by consumption of this preparation.

Muttiḷ	*Centella asiatica*
Puḷiyāral	*Oxalis corniculata*
Teccippū	*Ixora coccinia* - flower
Bālappanacci	*Diospyros malabarica*
Tuḷasiyila	*Ocimum sanctum* - leaf
Jīraka	*Cuminum cyminum*

* The black-greasy substance being produced in and around the wick in a constantly burning lamp. Ancient saints recommend this as an effective cure for all skin ailments in children.

Niśā	*Curcuma longa*
Maramañña̱l	*Coscinium fenestratum*

Irrigation of the head and body with buttermilk added with paste of nellikka and teṅṅinpūkkula (*Cocos nucifera* - inflorescence) relieves stomach ulcers. External application or consumption of sesame oil medicated with paccilapperumāḷ (*Stachystarpheta indica*), ānayaṭiyan (*Elephantopus scaber*), ceṛupanacci (*Diospyros malabarica*), cakiriccār (juice of coconut husk fibre) and karikkinveḷḷam (tender coconut water) in small doses relieves ulcers of the stomach. Water medicated with cerupanaci is also good.

Ghee medicated with the expressed juice of teṅṅinpūkkula as liquid component, and fine powders of yaṣṭī and jīrakam as solid component relieves stomach ulcer. Appropriate intake of ghee is also effective in stomach ulcers. Medicated ghee prepared from the expressed juice of ceṛukaṭalāṭi (*Cyathula prostrata*), kūva (*Maranta arundinacea*), niśā, pāṭhā (*Cyclea peltata*), teccimuraṭu (root of *Ixora coccinia*) as liquid component, and fine paste from veṭṭilañeṭṭi (*Piper betel* - leaf stem) relieves stomach ulcer and bleeding from rectum.

Candanam and sahasravedhi (*Ferula asafoetida*) mixed with buttermilk on consumption relieves dysentery in infants. This drug may also be applied on the nipple. Kāvimaṇṇu (red ochre) mixed with butter on consumption relieves ulcers in the mouth. Fine powders of gairika (red ochre) and añjana (black antimony) shall be rubbed on the head for growth of hair and relief of heat. Belching of breast milk in children is relieved by consumption of fine powder of jīrakam with honey and ghee. Consumption of fine paste prepared from the root of kūvaḷam is also effective. Root of ceṛuvazhutina (*Solanum indicum*) and pippali (*Piper longum*) can also be given in the same way. Vetuttacōriṭṭityādi (Cross ref. Atisāra cikitsa, 60) is also good. Intake of buttermilk medicated with jīrakam increase appetite. Mukkuṭi* prepared with jīrakam and muttiḷ also promotes digestion.

Flatulence caused by worms (intestinal parasites) is relieved by consumption of a rice porridge cooked in buttermilk medicated with finely crushed tulasiver (root of *Ocimum sanctum*), vizhālvērmēlttoli (*Embelia ribes* - root bark), kāṭṭutippalivēr (*Piper longum* - root) and muriṅṅātoli (*Moringa oleifera* - bark). Coconut milk also may be added to it for seven days. On the eighth day, intake of a kaṣāya prepared from vizhālari (*Embelia ribes*), kaṭukka (*Terminalia chebula*) and trikōlppakkonna (*Operculina turpethum*) is prescribed for purgation.

Gruel prepared from buttermilk medicated with ceṛukaitavēr (*Pandanus odoratissimus*), can be consumed added with small quantity of coconut milk. The dose of components in medicines is to be adjusted according to age. Irrigation of abdomen with warm kāṭi relieves edema. Water boiled with puḷiyila (*Tamarindus indica* - leaves) sufficiently warm can also be used for irrigation. Dose shall be adjusted based on the treatment of krimi (Krimicikitsa). Discharge of dense or white liquid through the urinary tract is to be treated as that of spermatorrboea. Intake of rice porridge medicated with ceṛupūḷa (*Aerva lanata*) is effective. A combination of ñeriñña̱il (*Tribulus terrestris*) and ceṛupūḷa prepared in the same way is also effectual. Intake of nilappanakkizhaṅṅu (*Curculigo orchioides* - tuberous root) fried in ghee is prescribed. Rice

*A liquid preparation in which drug/drugs are cooked in butter milk, churned well and boiled

porridge prepared in milk is also good. Kuruvikkizhaṅṅu (*Corallocarpus epigaeus*) and nilappanakkizhaṅṅu fried in ghee is also effective. Fever and loss of weight are treated with the application of no-cake paste or Lākṣādi tailam on the body.

Fine powders of the following, licked with ghee in the morning, makes the Goddess of Speech remain in the mouth of the child i.e. gives clarity of speech.

Viśva	*Zingiber officinale*
Ajamoja	*Trachyspermum roxburghianum*
Rajanīdvaya	*Curcuma longa* *Coscinium fenestratum*
Saindhava	Rock salt
Ugrā	*Acorus calamus*
Yaṣṭyāhva	*Glycyrrhiza glabra*
Kuṣṭha	*Saussurea lappa*
Magadhotbhava	*Piper longum*
Jīraka	*Cuminum cyminum*

Consumption of medicated ghee prepared from the expressed juice of brahmi (*Bacopa monnieri*) as liquid component, and the fine powders of the following as solid component promotes the intellect of the child.

Vyoṣa	*Zingiber officinale* *Piper nigrum* *Piper longum*
Varā	*Terminalia chebula* *Emblica officinalis* *Terminalia bellirica*
Paṭu	Rock salt
Rajanī	*Curcuma longa*
Trivṛtā	*Operculina turpethum*
Vacā	*Acorus calamus*
Śarkkara	Sugar
Viḷaṅga	*Embelia ribes*

Fine powders of the following, licked with ghee makes the child a poet in 41 days.

Cukku	*Zingiber officinale*
Tippali	*Piper longum*
Vacā	*Acorus calamus*
Niśādvayam	*Curcuma longa* *Coscinium fenestratum*
Koṭṭam	*Saussurea lappa*

This powder can also be consumed with Brāhmīghṛta.

Four prastha* of the expressed juice of brāhmī is to be added to one prastha of ghee. Fine powders of the following in the specified quantities are to be added as solid component. This medicated ghee; prepared by Sarasvati (Goddess of Speech) called Brāhmīghṛta on consumption provides clarity of speech.

Haridrā	*Curcuma longa*
Āmalakam	*Emblica officinas*
Trivṛtā	*Operculina turpethum*
Harītakī	*Terminalia chebula* each 1 pala*
Pippali	*Piper longum*
Hastipippali	*Scindapsus officinalis*
Viḷaṅga	*Embelia ribes*
Saindhava	Rock salt
Śarkkara	Sugar
Vacā	*Acorus calamus* each 1 karṣa*

Child who passes urine at every night during sleep shall drink the water that is obtained by washing the feet of the idol of Lord Krishna in child form. Child who licks fine powder of vacā and honey rubbed with a gold rod becomes more efficient in speech and intellect than Lord Vācaspati, King of Words.

*1 prastha = 768 ml; 1 pala = 48 g; 1 karṣa = 12 g