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CLINICAL AND COMPARATIVE STUDY OF JATIPHALA AND JAVITRI IN HYPERPIGMENTATION

[1]*Yasmin S., [2]Dixit Renu and [3]Reddy K.V.V. Bhaskara

[1]PG Scholar, Dept. of Dravyaguna, [2]Associate Professor, Dept. of Dravyaguna, [3]Associate Professor, Dept. of Shalya.

S. V. Ayurvedic Medical College, Tirupati, A. P.

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***Corresponding Author**
Yasmin S.
PG Scholar, Dept. of Dravyaguna, S. V. Ayurvedic Medical College, Tirupati, A. P.

ABSTRACT

The clinical efficacy of seed and aril of Nutmeg (*Myristica fragrans* Houtt.) was evaluated in a randomized, single- blind, Placebo controlled study in patients with hyperpigmentation. After three months single blind run in period, 30 patients with hyperpigmentation were randomly allocated to receive either a drug treatment or matching placebo for a period of 3 months. Clinical efficacy was evaluated every forth night for three sittings or till the sign are relieved on the basis of parameters *Varna, Khara* and *Parimana.* Other parameters like Thyroid profile, complete blood count and ultrasound were carried out. Treatment with the seed and aril of Nutmeg produced a significant drop in *Varna, Khara* and *Parimana*. With in between in the group comparison was done *Varna* was statistically significant (F=6.613, p=0.0046, p>0.05). In between group comparison *Khara* was showed statistically significant (F=7.1632,P=0.0032,P>0.05) and finally in between Group comparison of *Parimana* also showed statistically significant (F= 7.019, P=0.0035,P>0.05) Side effects observed with this nutmeg did not necessity withdrawal of treatment.

KEYWORDS: Ayurveda, clinical trail, Hyperpigmentation, Seed and Aril of nutmeg.

INTRODUCTION

Clinical trial

For the purposes of registration, a clinical trial is any research study that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects on health outcomes.

There are two goals to testing medical treatments: to learn whether they work well enough, called "efficacy" or "effectiveness"; and to learn whether they are safe enough, called "safety". Neither is an absolute criterion; both safety and efficacy are evaluated relative to how the treatment is intended to be used, what other treatments are available, and the severity of the disease or condition.

Clinical research is a branch of healthcare science that determines the safety and effectiveness of medications, devices, diagnostic products and treatment regimens intended for human use. These may be used for prevention, treatment, diagnosis or for relieving symptoms of a disease.

The present study is planned to see the efficacy of seed of Jatiphal (*Myristica fragrans* Houtt.) Javitri (Aril) lepa in the patients of *Vyanga* (Hyper pigmentation). The details of work flow are presented in this chapter.

AIMS AND OBJECTIVES

AIMS

To study the efficacy of Jatiphala (*Myristica fragrans* Houtt.) seed and Javitri (aril of Jatiphala) in the *Vyanga* (Hyperpigmentation) along with its pharmacognostic and clinical study.

OBJECTIVES

- The object of proposed thesis work is to review the literature from Vedic period to till date of JATIPHALA and JAVITRI.
- To conduct preliminary pharmacognostic, physicochemical, phytochemical and clinical studies.
- The systematic clinical correlation of JATIPHALA and JAVITRI in VYANGA.

The present clinical study has been presented in two forms

1. Material and Method
2. Observation and Result

The observation again consists of two parts i.e.

1. The Demographic profile of the patients under study and

2. Assessment of the response of the trail drug on the patients through Subjective and Objective parameters.

MATERIAL AND METHODS

a. Selection of drug

The quest for the search of right drug for *Vyanga* started with the study of pathogenesis of *Vyanga.*

In present world with increased UV penetration, pollution, irrational use of cosmetic, stressful life has led many people to suffer from hyperpigmentation. This not only suffers a person on the beauty lines but also becomes big medical aliment if left untreated, as it may become carcinogenic.

All the skin diseases in Ayurveda have been described under the heading of '*Kustha'* and '*Kshudra roga'*. *'Vyanga'* which is taken up for the study can be correlated with hyperpigmentation in modern medicine is mentioned as one of the *Kshudra rogas* in Ayurveda.

Most of the Acharyas have mentioned *Vyanga* in the chapter of '*Kshudra Roga.* Maharshi Caraka and Sushruta have considered Vyanga as a '*Raktaja Roga'* (C.S.Su.28/12).

Maharshi Caraka has given common samprapti for *Tilakalaka, Piplu, Vyanga* and *Nilika in Trishothiya Adhyaya* (C.S.Su.18/25). As Maharshi Caraka has not mentioned the chapter of the '*Kshudra Roga'*, so the detail or separate description about the disease *Vyanga* is not found.

Acharya Sushruta was the first person who has given a detail and separate description of the disease *Vyanga* in the chapter of '*Kshudra Roga'.* In *Nidana sthana* chapter 13 (*Kshudra Rogadhikar),* he has mentioned Nidana, Samprapti and Lakshana of *Vyanga* as well as differential diagnosis in one shloka (S.S.Ni.13/46).

As per Ayurveda the nidanas like *krodha, shoka, atapa, srama* lead to vitiation of vata and pitta leading to *rakta dusti,* which in turn cause *Niruja* (painless*), tanu (*thin*), syava* (accumulation of melanin pigment causing bluish or dark) colouration of mukha i.e. skin of face. (B.P.61/37).

Mainly two types of the therapies are found to be advised for the disease *Vyanga* as -

A. Shodhana therapy like *Vamana, Virechana, Nasya, Raktamokshana* etc.
B. Shamana therapy either as internal medicines or as external application of drugs in the form of *Lepa,* Oils etc.

In Ayurvedic text there is mention of many drugs in the disease of *Vyanga*. In addition to these, certain other special yogas are mentioned which not only cure the Vyanga but also increase the beauty, luster and complexion of the face.

As the disease has local spread over the skin of the face, the local or external applications have immediate impact upon the characteristic features of the Vyanga, such as discolouration, dryness of the face, burning sensations, itching etc.

Alepa being mentioned under *bahyaupachaara* and for correcting *bhrajakapitta* located in the skin, absorbs the drug into the body through skin.

The Lepa which is applied on the face gives strength to the muscle of eyes, cheeks has to be thick which enhance face complexion which in turn cures *Vyanga*. Alepa normalizes *Rakta* and *Pitta.*

So, the 'lepa' which is one of the forms of external application for skin diseases is taken for this study.

After rigorous search, JATIPHALA (*Myristica fragrans* Houtt.) seed and JAVITRI aril of *Myristica fragrans* Houtt were taken up for studies as it has been mentioned in the disease *Vyanga* by various acharyas in ayurvedic text as per the following properties:

properties	Jatiphala	Javitri
Rasa	Katu, Tikta	Katu
Guna	Laghu, Tikshna	Laghu
Virya	Ushna	Ushna
Vipaka	Katu	Katu
Dosa karma	Vata Kapha hara	Kapha hara
Karma	Varnya Dipana Grahi	Varnya, Dipana, Vrisya, Pacana
Indication	Vyanga	Vyanga

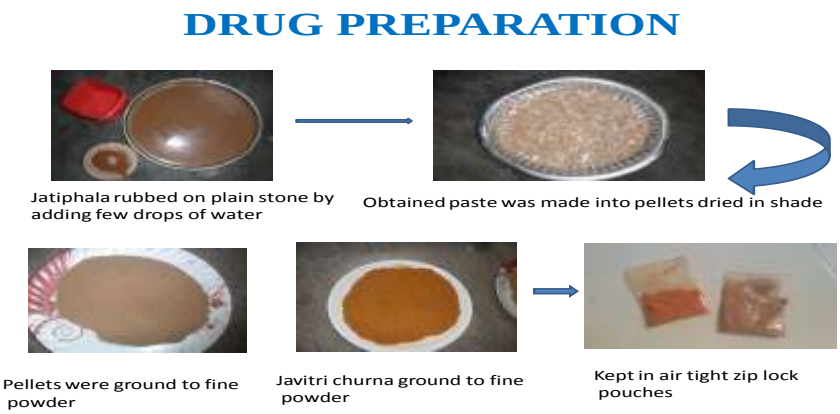
PREPARATION OF THE DRUG

1. Collection of Drugs (Jatiphala and Javitri)
2. Curna preparation

1. Collection of Drugs (Jatiphala and Javitri)

Both drugs Jatiphala and Javitri were purchased from Kerala, each 4 kgs. Later examined for genuinity of drugs by identifying them with the original drugs available in the department and discussing with experts.

2. DRUG PREPARATION



Jatiphala

The preparation of Jatiphala *curna* was done for the comfort of the Patient. As the fresh preparation of Jatiphala *curna* advised to each patient may sometimes cause irregular medication as the patient avoid preparing and applying it. So and easy method was adopted to maintain the Sastreeya preparations and the comfort of the patient.

The Jatiphala seed (*Myristica fragrans* Houtt.) was taken and was rubbed on a plain stone used for extracting sandal wood paste, by adding few drops of water, the procedure was continue till the seed got exhausted. Then the obtained paste was made into small pellets dried in the shade. These pellets were ground to fine powder by using Khalvam. The powder was sieved get the fine powder and collect powder was kept in air-tight Polythene bags.

Javitri

The preparation of Javitri curna was done for the comfort of the Patient. As the fresh preparation of Javitri curna advised to each patient may sometimes cause irregular medication as the patient avoid preparing and applying it. So and easy method was adopted to maintain the Sastreeya preparations and the comfort of the patient.

The Javitri (Aril of *Myristica fragrans* Houtt.) was cut into small pieces and grinded in the Mixer to get coarse powder. During the preparation there was minor hurdle in making into

fine powder. The all contents of the Javitri stuck to the Mixer avoiding made into fine powder. The powder was sieved and powder was collected. The coarse powder left over in the sieve was again subjected to grinding and this procedure followed till the fine powder was obtained. The obtained fine powder was packed in the Air-tight zip lock small pouches.

Placebo: Rice powder was taken for comparative study of Jatiphala and Javitri.

Application Method

The Jatiphala powder was mixed in raw milk and applied over the areas affected with the Vyanga on the face for 15 minutes.

In the same way, Javitri curna was mixed in raw milk and applied affected part of the face for 15 minutes.

DOSE: - Dose of the drug was not fixed dependent on the area of the patches on the face. But the pouches of powder made of 5 gm each.

After the applied of the paste, the patient was advised to wash the face with luke warm water and wipes with towel.

Duration of treatment

Total duration of treatment was taken either as 3 months or clearing up of the hyperpigmentation patches on face, whichever is earlier. Follow up of all the patient was done at an interval of 15 days up to 3 months.

STUDY DESIGN

a. Selection of Patients

Present study was done on 44 cases of Vyanga (Hyper pigmentation) selected from the O.P.D. of P.G. Department of Dravyaguna at S. V. Ayurvedic Hospital, Tirupati. Out of these, 14 cases did not turn up for follow up, thus the present study includes only 30 patients. Most of the cases taken up for the study are known case of Hyperpigmentation along with other complaints. All the cases were registered as OPD cases.

Inclusion criteria

- Patient's age group of 20 – 60 years
- Patients suffering from hyper pigmentation

- Post inflammatory hyper pigmentation
- Melasma
- Exposed to certain chemicals
- Sun tan
- PCOS
- Scar due to hyper pigmentation was selected for the study to evaluate efficacy of present combination.

Exclusion criteria

1. Age < 20 years and >60 years.
2. Vyanga (Hyper pigmentation) caused due to any systemic disease like Addison's disease, Cushing's syndrome.
3. Vyanga (Hyper pigmentation) caused since birth like Nevus of Ota (Birth mark).
4. Vyanga (Hyper pigmentation) caused by tumor like malignant melanoma

THE STUDY PROTOCOL

In all subjects, history taking, clinical examination and laboratory investigations was done, which included screening for Hyper pigmentation as per Performa (Appendix).

Pretreatment Evaluation

All the patients were studied at the time of registration for their age, sex, marital status, socio economic status (Rural / Urban) religion, education, occupation and monthly income, appetite, digestive power, addiction, bowel habit, dietary habits and life style.

After preliminary registration, patient was subjected to record their detailed case history and physical examination as per following schedule.

- Chief Complaints with Duration
- History of present illness
- History of past illness
- Family history of relevant disease
- Menstrual history (in case of females)
- Physical examination

In general examination, general condition, pulse rate, blood pressure, respiration rate, height, weight, body temperature, pallor, cyanosis, icterus, oedema, clubbing, thyroid enlargement, lymph nodes etc. were examined.

Systemic examination was conducted for detailed check of cerebrovascular, cardiovascular, nervous system and ophthalmic complications to exclude any complications.

To exclude the patients with abnormalities of liver, plural effusion, tuberculosis and other systemic disease examination of respiratory system, gastro intestinal system, and genitourinary system was also carried out.

DIAGNOSTIC CRITERIA

Routine biochemical (Hematological), TC**,** DC, Hb%, ESR Thyroid profile, Liver function test and Pathological (Urine and Stool examination) investigations to assess the general condition of the patients.

DRUG ADMINISTRATION

The patients have been divided into three groups. Each group contains 10 patients.

GROUP 1: Treated with Jatiphala mixed with raw milk in the pesita form and applied over the affected part of the face for 15 minutes.

GROUP 2: Treated with Javitri churna mixed in raw milk in form of paste and applied over the affected part of the face for 15 minutes.

GROUP 3: Treated with Placebo lepa. (Rice powder).

Duration of the treatment: 3 months.

Diet and life style - All the patients during the treatment were directed to follow the dietary restrictions like reduce intake of Katu Rasa, Lavan Rasa dravyas, Ushna virya dravyas and Non-vegetarian food which increases vata and pitta doshas like fish, chicken, mutton etc. and to protect from sunlight.

PARAMETERS OF ASSESSMENTS

Criteria to assess the effect of the trial drug

All the selected patients were advised to come for follows up at every 15 days interval up to 3 months or till the disappearance of hyperpigmented patches.

Assessment was done under the headings subjective and objective parameters.

Subjective Assessment

The patients with the clinical signs and symptoms of the disease Vyanga as per Ayurvedic as well as modern texts was considered. For the purpose of perfect diagnosis and assessment a special research Proforma was utilized (Annexure).

The assessment of the Subjective parameter were totally done on the sign and symptoms mentioned in Sastras and the grading was done.

In each follow up the patients were assessed on the basis of improvement in subjective parameter.

- Varna
- Khara
- Parimana of Vyanga

This clinical symptomatology Varna, Khara and Parimana were divided into 4 grades (0-4), 2 grades (0-1) and 4grades (0-4) respectively. Changes in gradations of sign were assessed.

i. The clinical grading is mentioned as below

a) Varna

SIGN	SCORE	Grading Criteria of Sign
Varna	0	Normal skin colour
	1	Very light brownish colour patch
	2	Reddish brown colour patch
	3	Block colour patch
	4	Dark Black colour patch thickness in the skin

b) Khara

SIGN	SCORE	Grading Criteria of Sign
Khara (Rough)	0	Roughness Absent
	1	Roughness Present

c) Parimana

(Measured in cm).

SIGN	SCORE	Grading Criteria of Sign
Parimana (Area covered)	0	No Patch
	1	Area of patch from 0 -0.5 cm
	2	Area of patch from 0.5 – 1.0 cm
	3	Area of patch from 1.0 – 1.5 cm
	4	Area of patch more than 1.5 cm

PROGRESS OF SIGNS

SIGN	Grading as mentioned above						
	On the 1st Day	1-15th day	16- 30th Day	31- 45th day	46- 60th day	61-75th Day	76-90th day
Varna							
Khara							
Parimana							

Objective Assessment This was done as follow:

- Routine biochemical (Hematological),
- Thyroid profile
- Liver function test and
- Pathological (Urine and Stool examination) investigations to assess the general condition of the patients.

PHOTOS – BEFORE & AFTER TREATMENT

Group A (Jatiphala)

Group A (Jatiphala)

Group A (Jatiphala)

Group B (Javitri)

Group B (Javitri)

OBSERVATIONS

Showing improvement in Varna, Khara and Parimana in GROUP A

Parameters	Mean		Mean Diff.	S.D.		S.E.		T	P	Significance
	B.T.	A.T.		B.T.	A.T.	B.T.	A.T.			
Varna	2.80	1.70	1.10	0.92	0.82	0.29	0.26	11.0000	< 0.0001	Extremely Significant
Khara	1.00	0.20	0.78	0.00	0.42	0.00	0.13	5.2915	0.0007	Extremely Significant
Parimana	3.10	1.90	1.20	0.88	0.74	0.28	0.23	9.0000	< 0.0001	Extremely Significant

Above table shows reduction in Varna, Khara and Parimana in A group and extremely significant in Varna and Parimana (p<0.0001). Extremely significant in Khara also (p=0.0007).

Showing improvement in Varna, Khara and Parimana in three groups: Group-B

Parameters	Mean		Mean Diff.	S.D.		S.E.		T	P	Significance
	B.T.	A.T.		B.T.	A.T.	B.T.	A.T.			
Varna	3.00	1.60	1.40	1.05	0.70	0.33	0.22	8.5732	< 0.0001	Extremely Significant
Khara	1.00	0.40	0.60	0.00	0.52	0.00	0.16	3.6742	0.0051	Very Significant
Parimana	2.80	1.70	1.10	0.92	0.67	0.29	0.21	6.1279	0.0002	Extremely Significant

Above table shows reduction in Varna, Khara and Parimana in B group and extremely significant in Varna (P =<0.0001) and Parimana (p =0.0002). Very significant in Khara (p=0.0051).

Showing improvement in Varna, Khara and Parimana in three groups: Group-C

Parameters	Mean		Mean Diff.	S.D.		S.E.		T	P	Significance
	B.T.	A.T.		B.T.	A.T.	B.T.	A.T.			
Varna	2.90	2.80	0.10	0.88	0.92	0.28	0.29	1.0000	0.3434	Not Significant
Khara	1.00	0.90	0.10	0.00	0.32	0.00	0.10	1.0000	0.3434	Not significant
Parimana	3.00	2.90	0.10	0.94	0.88	0.30	0.28	1.0000	0.3434	Not significant

Above table shows reduction in Varna, Khara and Parimana in B group and Not significant in Varna, Khara and Parimana (P = 0.3434) Parimana.

RESULTS OF THERAPEUTIC TEST

Showing distribution of patients having Varna before and after treatment in all groups:

VARNA	BT Mean ± S.D.	AT Mean ± S.D.	Within the group Paired' t' test value BT- AT	Mean difference	Between the group comparison oneway Annova F value
Group A	2.80 ± 0.92	1.70 ±0.82	t =11.0000 p < 0.0001 Extremely significant	1.10	F = 6.613 P = 0.0046 P > 0.05
Group B	3.00 ± 1.05	1.60 ± 0.70	t = 8.5732 p < 0.0001 Extremely significant	1.40	
Group C	2.90 ± 0.88	2.80 ± 0.92	t =1.0000 p = 0.3434 Not significant	0.10	

Above table shows reduction in Varna in A & B groups which is extremely significant in groups A, B ($p<0.0001$). Initial mean and SD reduced from 2.80 ± 0.92 to 1.70 ± 0.82 after three months treatment regimen in group A. Decrease in initial mean and SD was from 3.00 ± 1.05 to 1.60 ± 0.70 in group B. In group C initial mean and SD declined 2.90 ± 0.88 to 2.80 ± 0.92 after taking 3 month therapy. It is not significant.

Above data states that intergroup comparison was observed statistically Very significant.

Showing distribution of patients having Khara before and after treatment in all groups:

KHARA	BT Mean ± S.D.	AT Mean ± S.D.	Within the group Paired' t' test value BT- AT	Mean difference	Between the group comparison oneway Annova F value
Group A	1.00 ± 0.00	0.20 ± 0.42	t = 5.2915 p =0.0007 Extremely significant	0.78	F = 7.1632 P = 0.0032 P > 0.05
Group B	1.00 ± 0.00	0.40 ± 0.52	t =3.6742 p =0.0051 Very significant	0.60	
Group C	1.00 ± 0.00	0.90 ± 0.32	t =1.0000 p =0.3434 Not significant	0.10	

Above table shows reduction in Khara in A & B groups. A group is extremely significant in groups A (p<0.0007), B group (p=0.0051) is Very significant. Initial mean and SD reduced from 1.00 ± 0.00 to 0.20 ± 0.42 after three months treatment regimen in group A. Decrease in initial mean and SD was from 1.0 ± 0.00 to 0.40 ± 0.52 in group B. In group C initial mean and SD declined 1.00 ± 0.00 to 0.90 ± 0.32 after taking 3 month therapy. It is not significant. Above data states that intergroup comparison was observed statistically Very significant.

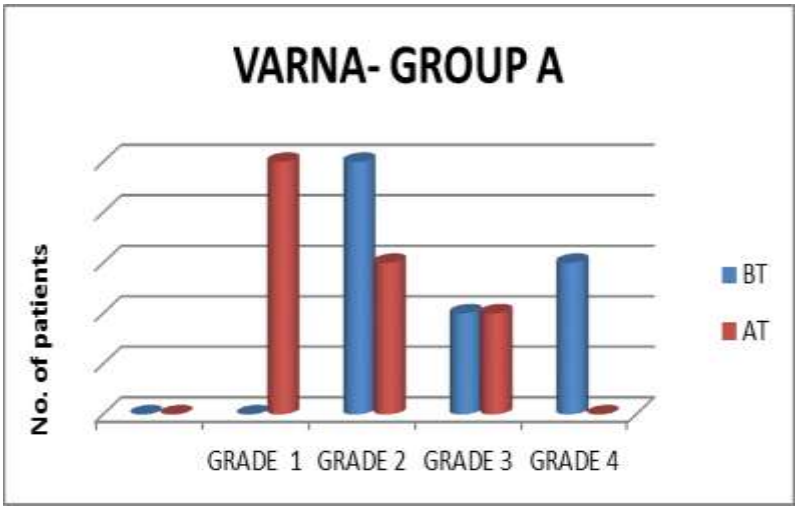
Showing distribution of patients having Parimana before and after treatment in all groups:

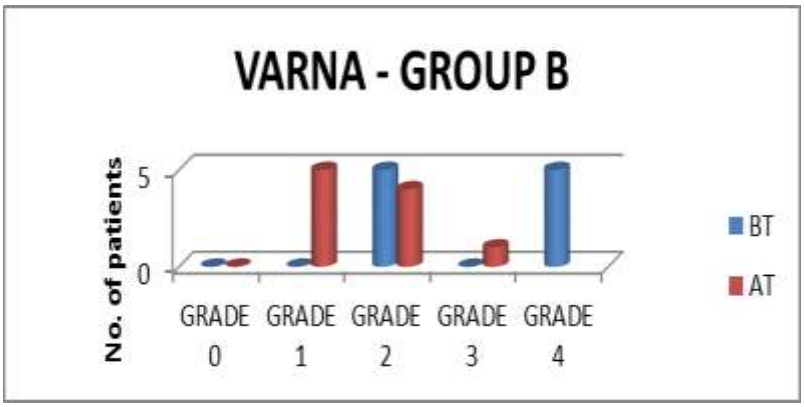
PARIMANA	BT Mean ± S.D.	AT Mean ± S.D.	Within the group Paired' t' test value BT- AT	Mean difference	Between the group comparison oneway Annova F value
Group A	3.10 ± 0.88	1.90 ± 0.74	t =9.0000 p <0.0001 Extremely significant	1.20	F = 7.019 P = 0.0035 P > 0.05
Group B	2.80 ± 0.92	1.70 ± 0.67	t =6.1279 p = 0.0002 Extremely significant	1.10	
Group C	3.00 ± 0.94	2.90 ± 0.88	t =1.0000 p = 0.3434	0.10	

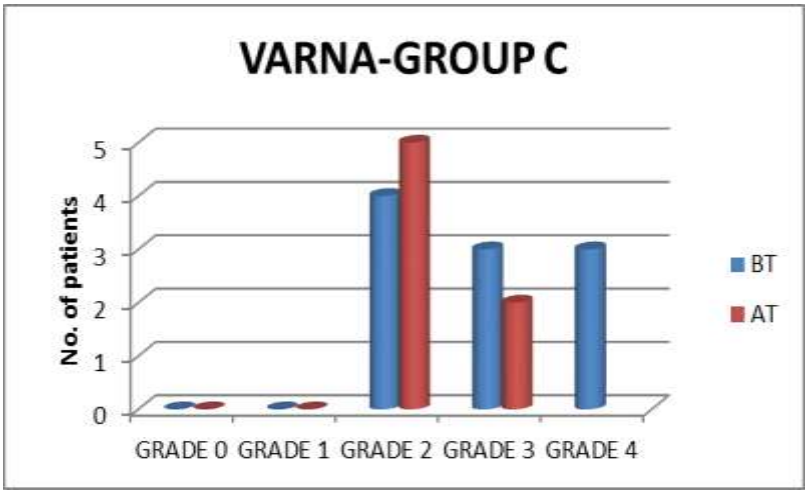
			Not significant		

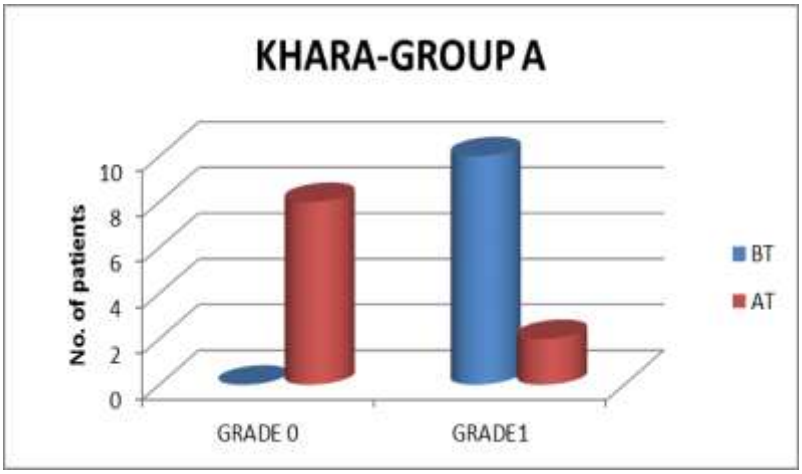
Above table shows reduction in Parimana in A & B groups. Which is extremely significant in group A ($p<0.0001$) and group B ($p= 0.0002$). group is Initial mean and SD reduced from 3.10 ± 0.88 to 1.90 ± 0.74 after three months treatment regimen in group A. Decrease in initial mean and SD was from 2.80 ± 0.92 to 1.70 ± 0.67 in group B. In group C initial mean and SD declined 3.00 ± 0.94 to 2.90 ± 0.88 after taking 3 month therapy. It is not significant. Above data states that intergroup comparison was observed Statistically Very significant.

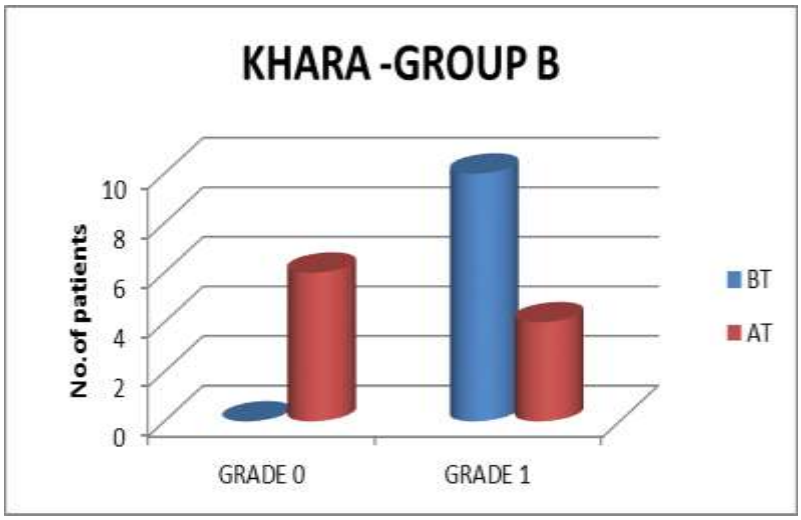
Distribution according to Varna, Khara and Parimana

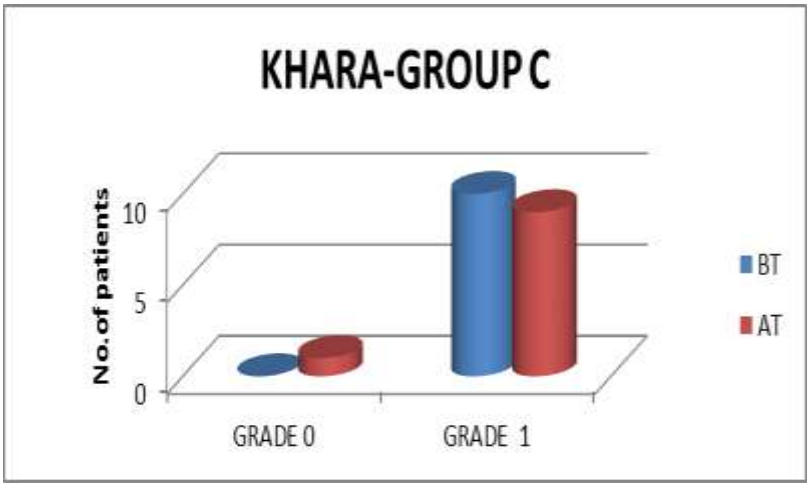


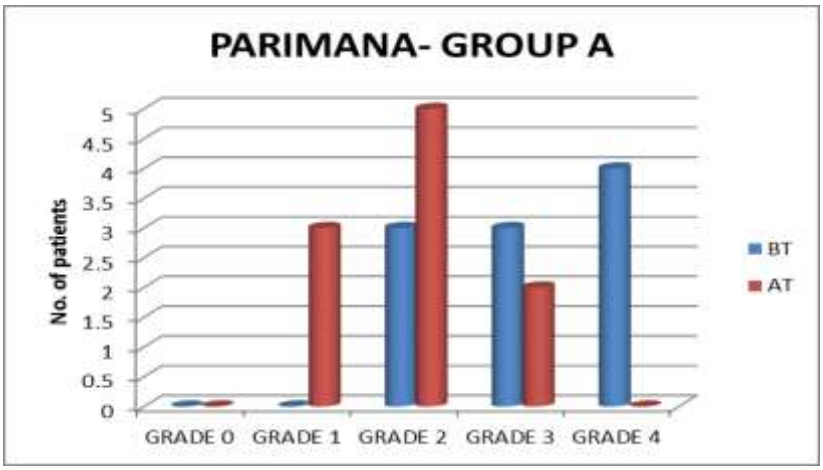


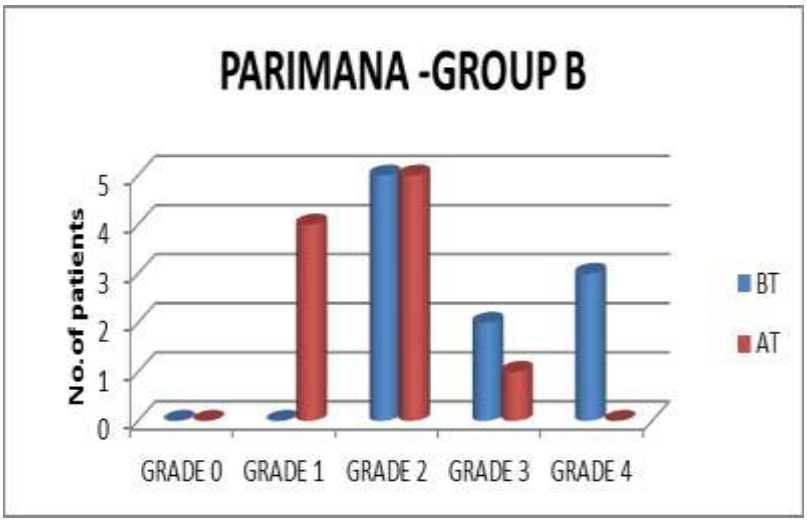

VARNA-GROUP C
No. of patients
0
1
2
3
4
5
GRADE 0
GRADE 1
GRADE 2
GRADE 3
GRADE 4
BT
AT

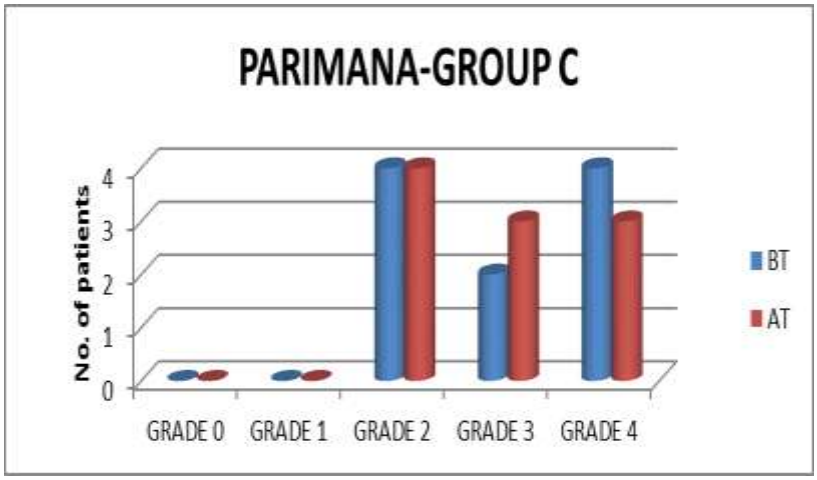

KHARA-GROUP A
No. of patients
0
2
4
6
8
10
GRADE 0
GRADE1
BT
AT


KHARA -GROUP B
No.of patients
0
2
4
6
8
10
GRADE 0
GRADE 1
BT
AT


KHARA-GROUP C
No.of patients
10
5
0
GRADE 0
GRADE 1
BT
AT


PARIMANA- GROUP A
No. of patients
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
GRADE 0
GRADE 1
GRADE 2
GRADE 3
GRADE 4
BT
AT


PARIMANA -GROUP B
No.of patients
5
4
3
2
1
0
GRADE 0
GRADE 1
GRADE 2
GRADE 3
GRADE 4
BT
AT



DISCUSSION

Any new Research to be born needs constant perseverance, imagination, observation and the experiences to give rise to new dimension for the expansion of the knowledge. In India there was tradition to transmit knowledge for one generation to other generation by oral, which later took the form of the documentation in the form of Vedas, Brahmanas, Puranas, Upanisads etc.

These knowledges either in oral or documented form when reaches the research scholars in this respective fields, becomes science for further analysis, which leads to development of fundamental knowledge or principles of that particular science.

The oldest documented knowledge found in India is Vedas. It becomes utmost responsibility of a scholar to go through the documented knowledge available from Vedic period so as to understand the subject which may help in expansion of the knowledge of the concepts.

Hence, in the beginning literary survey on the disease Vyanga was done from Vedic period. It is important to note that the term '*Vaivarnya*,' a skin disorder, was mentioned in Rigveda. The term Kustha appeared in Rigveda in the form of medicinal plants rather than the skin disorders. For the first time the word *'Kustha'* was found in Atharvaveda. In Atharvaveda there is a mantra used for improving the varna. There are also many drugs mentioned in Atharvaveda for '*Vaivarnya'*. There is a description of varnya in Bramhanakala, Puranas like Suryapuranam, Siva puranam and Garuda purana. In Agnipurana, treatment of kustha is available. **The word '*Vyanga*' was for the first time found in Garuda purana**. Garuda Purana mentioned treatment for Varnya. Varaha Mihira, Manusmriti and Mahabharata has the references of Varnya, Kustha and Tvak dosha respectively.

It was during the Samhita period, the detail known of vyanga has been added. Acharya Charaka as well as Acharya Sushruta both have ascribed that Vyanga is a '*Raktaja roga* '(C.Su.28/12) Acharya Charaka has stated a common Samprapti for Tilakalaka, Piplu, Vyanga and Nilika in Trishothiya Adhyaya (S.S.Ci.25/18). Maharshi Charaka has not devoted separate chapter on Kshudra roga. Maharshi Sushruta has mentioned Nidana, Samprapti and Lakshana of Vyanga as well as differential diagnosis in one shloka. (S.S.Ni.23/45-46). It was Maharshi Sushruta, who was first person to give a elaborative and separate description of the disease Vyanga in the chapter of '*Kshudra Roga'* in Nidana sthana chapter 13 (Kshudra Rogadhikara).

Acharya Madhavakar, Sharangadhara, Yogaratnakar, Bhavamishra, Chakradatta and Vangsen have followed Maharshi Sushruta by adding Vyanga in Kshudra Roga.

Acharya Vagbhata was the first person to clarify the disease Vyanga on the basis of doshaja predominance as Vataja, Pittaja, Kaphaja and Raktaja. The signs and symptoms of all the kinds of Vyanga has been discussed in Disease review. Principle of treatment of Vyanga roga and different types of Vyanga are also presented in same chapter.

Vyanga is a painless – patch which is thin and blackish in colour found on the face of the Human being. The signs and symptoms mentioned for Vyanga in Charaka Samhita, Sushruta Samhita and Astanga hridayam comparatively analyzed from the signs and symptoms of hyperpigmentation (Melanosis) of Modern medicine from available literature on skin diseases. It was observed that Nidana, signs and symptoms were described in medical text as found in Ayurvedic text.

Nidana of Vyanga as described in Ayurvedic text as compare to the aetiology of the hyperpigmentation.

According to Ayurveda

Nidana	**Vata Prakopa**	**Pitta Prakopa**	**Kapha Prakopa**	**Rakta Prakopa**
Aaharaja	Apatarpana, Sita, Ruksha Kashaya Tikta	Katu Amla Ushna Tikshna Vidahi Tikshna Upavasa Tila Dadhi	Ati Snigdha	Excess Ushna Excess Lavana Excess Kshara Excess Amla Excess Katu Viruddhanna Ajirna Adhyashana
Viharaja	Vyayma Jagarana Vega-Vidharana	Aatapa		Divasvapa Aatapa Anala Abhighata
Manasika	Atishoka			
Kalaja		Sharada Ritu Grishma Ritu		

According to Modern medicine

NO	**ETIOLOGY**	**HYPER MELANOSIS**
1	Physiological	Associated with Menstruation and Pregnancy
2	Developmental	Lentigines Mongolian spots Blue nevus Nevus of Ota Nevus of Ito
3	Genetic	Freckles Familial Periorbital -
4	Post inflammatory	Eczema Lichen planus Lupus erythmatous
5	Physical	UV Radiation, Thermal Radiation Trauma Solar Lentigines

Signs and Symptoms of Vyanga as compared to the signs and symptoms of Melanosis.

According to Ayurveda	According to Modern medicine
Shyava Varna	Brown - black pigmentation
Rukshata	Dryness of skin
Tanutva	Thinness of skin
Nirujam	No pain, Presence of itching
Mandalatva Aakruti	Irregular and non elevated in shape

Considering the similarities in aeitiology, signs and symptoms of Melanosis / hyperpigmentation were taken up for the study under Vyanga.

The criteria of selection of drug Jatiphala and Javitri has been discussed in earlier chapter. During our literary study we found that there is mention of Jatiphala and Javitri in Vyanga by various authors. (B.P.Ci.61/42), (Sd.N.1/34), (Ra.M.5/16), (G.N.3.5.149) and (V.C./ Kshudra roga prakaranam). The mention of the drug Jatiphala and Javitri in Candanadi Varga, Karpuradi Varga by different nighantukaras like Bhavaprakasha Nighantu, Dhanvantari Nighantu, Madanapala Nighantu and Raja Nighantu prompted us to pick up the drug for the study. In earlier chapter the detailed description and the mention of synonyms by various has been done. The various synonyms and it etymological derivations are tablelated below by various authors.

ETYMOLOGY OF SYNONYMS OF JATIPHALA

Jatiphala	The fruit is having fragrance
Jatikosha	The fruit is covered with a fragrant aril
Malatiphala	The fruit having fragrance
Malatisuta	
Jatisuta	
Jatisasya	The fruit having fragrance and covered with kosa- aril
Shaluka	The fruit looks like a tumour
Madhasaunda	The smell of the fruit causes intoxication
Jatisrunga	The fragrant aril can be peeled off easily
Puta	The fruit containing hallow structure which encloses the seed.
Soumanasaphal	The fruit is having a charming look or

Sumanaphala	beautiful.
Majjasara	The kernel of the fruit is used for medicinal Purpose
Jateesara	

ETYMOLOGY OF SYNONYMS OF JAVITRI

Jatipatri	The t is having fragrance
Jatikosa	The fruit having fragrance and covered with kosa- aril
Malatipatrika	The Aril is having fragrance like flower
Sumanahpatrika	
Jatiparna	
Malati	
Sumana	
Malanasini	It destroys visa
Patrika	The Aril has many wings like structure
Saumana sayi	Aril attracts due to its golden colour and fragrance
Jatiphala tvak	The fragrant aril can be peeled off easily and it covers the seed

Use of Jatiphala and Javitri in Ayurveda classics in various forms is already described earlier. On further study of the reference, it is found that following preparation are used in the treatment of Vyanga.

Name of the Text book	**Preparation**	**References**
Bhavaprakasha Samhita	Jatiphala seed lepam	B.P.Ci.61/42
Sodhala nighantu	Jatiphala seed lepam	Sd.N. 1/ 34
Gadanigraha	Jati +jatiphala	G.N.3.5.149
Rajamarthanda	Sasha rakta + jatiphala bahya tvacha lepa	Ra.M.5/16
Bhavaprakasha Samhita	Javitri lepam	B.P.Ci.61/42
Sankhalikhita Dharmasutra and Vishnudharmasutra	Jatiphala lepam + Candana	S.D. (128 sutra) V.dh. (66/2)

Regarding the Guna, Karma of Jatiphala described in various Ayurveda classics. It was

observed that **Dhanvantari Nighantu and Raja Nighantu described its Rasa as Kashaya and Katu where as Bhavaprakasha Nighantu, Kaiyadeva Nighantu, Priya Nighantu described it as Katu, Tikta. It was Adarsha Nighantu who has mentioned all the three Rasas that is Katu, Tikta, Kashaya for Jatiphala.**

Name	Rasa	Guna	Virya	Vipaka	Dosha Karma
Jatiphala	Katu,Tikta,	Laghu, Tikshna	Ushna	Katu	Kapha-vata hara
Javitri	Katu, Tikta	Laghu	Ushna	Katu	Kapha hara

On careful study of Samhitas it was found that, Acharya Charaka has mentioned Jatiphala in Mukhasodhana Dravya (C.S.Su.5/73) and other diseases but there is no mention of Jatiphala in Vyanga. Acharya Sushruta has enumerated Jatiphala in Tambulam Sevana and as Mukhasodhana Dravya. He has also not mentioned Jatiphala in Vyanga on detail study of Astanga Hridayam, Jatiphala was found in prakshepaka dravyas. But he too did not mention in Vyanga disorder. **Thakurji identified that at some places both Jati and Jatiphala are used as synonyms in Brihat trayi (S.S.Ci.24/31).**

For the first time Jatiphala (seed) in the form of Lepa was mentioned in Vyanga and Nilika by Bhavaprakasha Samhita in the Cikitsa Sthana (B.P.Ci.61/42)**.** Later Nighantus and Cikitsa granthas followed the same. Acharya Sharangadhara has mentioned special Karmas of Jatiphala for Sukrasthambana (Sa.Pu.Kha 4/ 17).

Regarding the Guna, Karma of Javitri described in various Ayurveda classics. It was observed that **Dhanvantari Nighantu and Bhavaprakasha Nighantu described its Rasa has Katu where as Kaiyadeva Nighantu and Madhanapala Nighantu described it as Katu, Tikta. It was Adarsha Nighantu who has mentioned all the three Rasas that is Katu, Tikta, Kashaya for Javitri.** On careful study of Samhitas it was found that, Acharya Sushruta has mentioned it in Mukhasodhana Dravya (S.S.Su.46/202).

Astanga Hridayam has mentioned in Mukhasodhana Dravya as well as in Dantha dharudyakaram (A.H.U.22/93) and other diseases, but there is no mention of Javitri in Vyanga. He has also not mentioned Javitri in Vyanga and on detail study of Astanga Hridayam it was observed that **Dhanvantari Nighantu and Bhavaprakasha Nighantu mentioned one of the actions of Javitri is Varnya.**

The procedure for the usage of the drug was taken up as Lepam, because as per references available for the disease Vyanga, the form in which drug was used here as lepa and this lepa was prepared by Pesita method, i.e., rubbing of the drug on plain stone used for extraction of sandal paste, The trail drug paste was made here with raw milk or unboiled milk.

The reason for taking unboiled milk is it has Jevaniya, Snigdha, Sita, Madhura rasa, Satmyam, Rasayana, Tvak Prasadana properties. Among the Gunas mentioned above, helps in reducing the Tikshna guna of Jatiphala and Javitri along with it burning sensation on application. It also helps in easy absorption through the skin, since it was noticed in studies that lipid have better absorption than the aqueous paste. Finally, Kshira reduces the Tikshnatha guna of Jatiphala making it Soumya, which prevents burning sensation which is the side effect of Jatiphala and Javitri.

The Pesita procedure of the paste was mainly done for the reasons micro absorption into the skin which helps the ingredients to reach into microcirculation of the skin. During the Pesita procedure the disintegration of the drug is done to its finest form of it's the particles helping in easy penetration.

The detailed study of the lepa was done from Vedic to the present. During the Samhita kala Acharya Charaka, Acharya Sushruta described uses of lepas, types of lepas and indications indetail which has been described earlier. There has been the detailed description of application methods, importance of lepa in many Samhitas. In most of the skin ailments, Sasthras have advised lepa application. The detailed description of lepa was found in Sarangdhara Samhita. Acharya Charaka, Acharya Sushruta and Acharya Vaghbhata have also mentioned lepa procedures, Types of lepas.

Myristica fragrans Houtt. is said to be native of spice Islands, Moluccas, Indonesia. *Myristica fragrans* Houtt. is a medium sized to large evergreen dioecious tree, cultivated in Karnataka and Kerala belongs to the family *Myristicaceae*. The botanical description has already been described in previous chapters. *Myristica fragrans* Houtt. in English is called as 'Nutmeg'.

The second drug Javitri belong to same plant but part is different. The part used in the case of Javitri is outer red fleshy net like part known as mace that is Aril and inner brown seed the nutmeg is Jatiphala.

Myristica fragrans Houtt. has drawn attention of Botanist, Phytochemist, Pharmacologist and Physicians for its various activities on Human body mentioned and discussed in earlier chapters. There has been recent reports of *Myristica fragrans* Houtt. As Antioxidant, Antidiarrheal, Hypnotic, Analgesic, Antimicrobial, Antidepressent, Sexual dysfunction etc. Recent Researches on *Myristica fragrans* **- Anxiolytic effect of *Myristica fragrans* using open field model. Anxiolytic effects of *Myristica fragrance* plant extracts against diazepam injection (10 mg) calmpose was used as standard reference drug** induced by B. Nagarjuna, Sahar.SH, Ali Bolouri, Neha Kushnoor Z. **Results :-** The lower dose of M. f. (25 mg / kg) showed significant increases in ($P<0.05$) in the number of 1) Ambulations when compared with vehicle control. 2) rearing, grooming, and fecal pellets.

- **Pharmacological studies on M. f. antidiarrheal, hypnotic, analgesic and hemodynamic (blood pressure) parameters.** By Grover J k, Khandkar S, Vats v, Dhunnoo. Y, Das. D Both nutmeg crude suspension (NMC) and petroleum ether (PE), but not aqueous extract (A q), decreased the mean number of loose stools (or) increased the latency period.

- **Journal of Genetic Engineering and Biotechnology, Chemistry, "Antioxidant and Antimicrobial potential of nutmeg" (M. f. Houtt)** by Ashish Deep Gupta. Vipin kumar bansal, Vikash Babu, Nishi Maithil. Seeds were extracted with acetone, ethanol, methanol, butanol and water. All the extracts have shown significant antioxidant & antimicrobial activities against the tested microorganisms. NMC but not PE extract showed a significant but weak analgesic effect. While PE effectively potentiated both phenobarbitone and pentobarbitone induced sleeping time, NMC was considerably less effective. NMC administered intra duodenally did not produce much effect on blood pressure (BP), but potentiated the action of exogenously administered adrenaline & nor-adrenaline.

- **"Hepatoprotective effect of Myristicin from Nutmeg (M. f.) on Lipopoly saccharide / D - Galactosamine - induced liver injury".** By Tatsuya Morita, Keiko jinno, Hirokazu kawagishi, Yasushi Arimoto (japan). To evaluate the hepatoprotective activity of spices, 21 different spices were fed to rats with liver damage caused by lipopolysaccharide (LPS) plus – D - galactosamine (D- GaIN).

- **"Anti bacterial activity of M. f. against (fruit) oral pathogens".** By Zaleha shafiei, Nadia Najwa Shuhairi, Nordiyana Md Fazly Shals yap and Carrie - Anne Harry sibungkil.

The ethyle acetate and ethanol extracts of flesh, mace and seed of M. f. was evaluated the bactericidal potential against three Gram - positive cariogenic bacteria [Streptococcus mutans, Streptococcus mitis and Streptococcus Salivarius] three Gram-negative periodontopathic bacteria [Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis and Fusobacterium nucleatum].

"An experimental study of sexual function improving effect of *Myristica fragrans* Houtt." (nutmeg) By Tajuddin, Abdul Latif, and Yusuf Amin. The present study was undertaken to evaluate the aphrodisiac effect of 50% ethanolic extract of nutmeg along with its likely adverse effects and acute toxicity using various animal models.

For any plant study, a consolidated Phytochemicals study is required for better understanding of Chemical compounds that occur naturally in plants. **Nutmeg oil - All parts of the plant, leaf, flower, fruit and seed contain oil,** Leaves from a mature tree yield 1.5% of oil containing **alpha-pinene**, 35; myristicin,1.85., The Leaves from younger female and male trees yield **oil (4%)** similar to the older trees, but with different composition and content. The flowers from the male tree contain 1.66 percent oil having a pleasant fragrance attributed to the higher concentration of **monoterpene alcohols like linalool, alpha-terpineol, terpinen-4-ol and their esters.** Eugenol, which gives the harsh note to the kernel, mace and leaf oils is found at a low concentration in the flower oil. The fruits and seeds contain 6-16 percent oil; higher percentage is found in wormy nutmeg. The oil contains mainly **d-pinene** and **d-camphene,** and a toxic substance, myristicin. The active principle in the nutmeg oil, eugenol has been reported to possess chemotherapeutic properties.

Mace oil and nutmeg oil showed strong nematicidal activity against *Meloidogyne incognita.* ***Oleoresin*** – The oil less rich in **monoterpenes,**

- The preliminary Phytochemicals was done in the department and following results obtained. It was noticed that Jatiphala powder with aqueous mixture had the presence of Alkaloids, Flavonoids, Fixed oils where as Javitri showed the presence of Carbohydrates, Tannins, Flavonoids and P^H of Jatiphala and Javitri were found to be 6. The Phytochemical analysis of Jatiphala powder and Javitri powder in milk showed the presence of Carbohydrates (green colour), Tannins and Carbohydrates (Orange colour)

and Tannins respectively. The P^H was found to be 7 in the both drugs. Milk extracts of the both drugs showed the absence of Flavonoids in both drugs and fixed oils in Jatiphala. **This consolidate our opinion that after adding milk the acidic nature of both drugs turned to neutral. (p^H 6 to p^H 7).**

The Pharmacognostic study has been dealt in detail in earlier chapters. The Jatiphala showed the presence of calcium oxalate crystals, large oil cells with cell wall. The endosperm contained Tannins and starch grains and aleuron grains where as the Javitri showed larger cells of oil bearing idioblasts, inbetween the idioblasts small angular or spindle shaped parenchymatous cells are present. Circular secretory oil cavities surrounded by epithelial cells and some of the ground parenchymatous cells containing aromatic compound. The powder analysis of **the Javitri showed absence of Starch grains and aleuron grains where as Jatiphala endosperm showed presence of starch grains.**

The Physicochemical analysis of both drugs were done and it was in par with the API, the results are explain in earlier chapter.

The HPTLC Studies showed, the test samples of Jatiphala and Javitri were compared for their HPTLC fingerprint profile using solvent system suitable for Myristicin standard. The samples showed many similarities in the HPTLC fingerprint profile as they belong to same botanical source. Totally 58 and 75 bands are detected in Jatiphala and Javitri respectively. Javitri showed many chemical constituents compared to Jatiphala, most of constituents present in Jatiphala are also present in Javitri, but with higher concentration of most of the constituents including Myristicin, as revealed by the intensity of bands / peaks at same R_f Probably, for the above stated reason, Javitri shows more active chemical constituents than Jatiphala. It should be proved clinically whether the active chemical constituents obtained in Javitri are useful in Vyanga or not.

Looking into the above stated facts about drug Jatiphala and Javitri, it was prescribed in the Vyanga for comparative study to assess the best among the two. On our initial observation, it was found that when Javitri was given in the powder without milk it produced mild burning, as powder form of Javitri was given only to few patients who had come from long distance. The preparation of Jatiphala and Javitri are mentioned in earlier chapters for the above reasons both the drugs were applied with raw uncooked Gokshira to the patients. The patient were divided into 3 groups contain ten each. Group A is Jatiphala, Group B is Javitri, Group

C is placebo where rice powder was taken for the study (the reason for the rice to be taken was, it does not has any Varnya action). The application method has been discussed in clinical study. The dose was dependent on the area of the patch. The lepa was applied in the thin layer and was left for 15 minutes, later washed with lukewarm water.

The criteria of selection of patients is already discussed in earlier chapter. Out of 30 patients 13 patients were between the age group of 31-40 years (43.33%) This is considered the most vulnerable age as the patient is lot stressed up and according to Ayurveda it said to be Madhya vayas which is pitta predominant. So Vata and Pitta predominance with the nidana like Kama, Krodha intake of Katu, Usna aharas and Maximum exposure to the sun may lead to the disease.

Maximum number of 22 (73.33%) were females patients having Vyanga. Looking into the Age and Gender distribution it can be assessed that the hormonal changes in the women might have been one of the main reasons for Vyanga.

On observation of Marital status, it was found that 24 (80%) were married class. This is reason may be changes occurring during the child bearing period which is also one of the causes of Vyanga.

The religion wise distribution showed that 28 (93.33%) were Hindu patients. This statistical data is due to tirupati and surrounding areas were Hindu dominant areas.

Looking in to the occupation it was noticed that maximum number were House wife, 14 patients (46.66%), who are more prone to Vyanga compare to other occupations i.e. the reasons again may be the Hormonal changes and stress condition.

Urban people i.e. 19 (63.33%) were more affected than rural people. The reasons may be stress, over exposure to the pollution, irregular bowel habits and irregular sleeping habits.

Among the socio- economic status it was found that very poor data 14 (46.66%) were more effected with Vyanga. The reasons may be intake of more Katu, Tikta aharas, stressful life, over exposure to the sun and sleep disturbance.

Illiterates among the education wise distribution maximum number of 13(43.33%) were found to be more affected.

Among the dietary habits, patients 29 (96.66%) with mixed diet more prone to the Vyanga reason may be intake of Katu rasa which indirectly increased vata and pitta causing vyanga.

Agni in Ayurveda is said to be prime important for the healthy being which is correlate to digestive power in the study. It was found that 13 (43.33%) patients were of poor digestive power, this leads to formation of ama. which causes sroto sanga leading to vyanga.

Bowel habits are prime to maintain proper health and source of diseases when not maintained properly. In the study maximum patients 19 (63.33%) were of irregular bowel habits. Constipation is also one of the causes for Vyanga.

While observing the physical activities it was noted that 14 (46.66%) patients were having moderately active life. Moderately active life leads to all the conditions mentioned above like poor agni and irregular bowel habits which may cause sroto sanga and leading to Vyanga.

When the data of illness was assessed Maximum number of patients 16(53.33%) were of chronic in nature that is above 2 years. (The reason for this may be patients usually visit Ayurvedic clinics when they have lost hopes with modern medicine).

When the Family history was considered for the study it was seen that the patients 22 (73.33%) with the family history were more prone to vyanga. The reasons for this being skin said to be Mathruja bhava and genetically to the skin texture and sensitive is adaptability of parents.

Pattern of onset of the disease was gradually in 28 patients (93.33%), which shows that the disease has gradual onset the acute assessment of signs and symptom of Vyanga was done adopting standard methods of scoring and data obtained systematically collected and documented.

The Fitzpatric scale was used to assess the signs and symptoms on every forth night for three sittings or till the signs are relieved. The follow up period was up to 3 months. During follow up period of 60 days the signs and symptoms were assessed on 60^{th} and 90^{th} day. All obtained numerical values were as per the Fitzpatric scale, later numerical findings of all subjectively parameters were analyzed statistically with paired t test. In case of Varna both Group A ($p < 0.0001$) and Group B($p<0.0001$) showed statistically extremely significant results when compared to Group C ($p = 0.3434$). Khara was statistically extremely significant in the Group

A (p=0.0007) when compared to the Group B (p=0.0051), which showed statistically very significant and Group C statistically not significant (p =0.3434). The khara symptom was reduced in the Jatiphala where as Javitri showed slow process. Parimana was statistically extremely significant in case of Group A (p=<0.0001) and Group B (p=0.0002) in comparative Group C(p=0.3434). When with inbetween in the group comparison was done Varna was statistically significant (F=6.613,p=0.0046,p>0.05). In khara inbetween group comparison showed statistically significant (F=7.1632,P=0.0032,P>0.05) and finally in between Group comparison of Parimana also showed statistically significant.

Probable mode of action

The probable mode of action of the drugs in the disease is by following points.

1. Drug action
2. Procedure i.e. lepa
3. Preparation of the drug (pesitha and kshira)

The two drugs i.e. Jatiphala and Javitri taken up for study and mention of both drugs for Varnya is found in the nighantus Javitri in Dhanvanthari nighantu and Jatiphala in Bhavaprakasha samhita are mentioned for first time in Vyanga. Both the drugs are different parts of the same tree having same rasa, guna, virya, vipaka still the results of the action of the both the drug has been different. There is controversy in the rasa of the both the drugs, few authors mentioned it as katu, Tikta and few kashaya, katu wheras Adharsha nighantu mentioned it as katu, Tikta, kashaya.

Since the disease Vyanga is considered the disease of disturbed Bhrajak pitta, rasa, rakta vaha sroto dusthi, vata and pitta prakopa also involving kapha which obstructs rasavaha srotas leading to syavatvam of the skin by causing the prakopita Bhrajaka pitta to be deposited below the skin layers that is in epidermis. The Katu Tikta rasa of Jatiphala and Javitri tackles srotodusti caused by agnisada (which forms ama and leads to srotodusti). The Tikta rasa of Jatiphala and Javitri causes pitta samaka which is vitiated due to the intake of pitta ahara dravyas.

Dasa Guna of Kshiram in Gorasa Varga:

स्वादु शीतं मृदु स्निग्धं बहलं स्लक्ष्णपिच्छिलम् ।

गुरु मन्दं प्रसन्नं च गव्यं दशगुणं पयः ॥२१७॥

तदेवग्डण्मेवौजःसामान्यादभिवर्धयेत् ।

प्रवरं जीवनीयानां क्षीरमुक्तं रसायनम् ॥२१८॥ (C.S.Su.27/217-218)

The snigdha, soumya, Sita, Rasayana, Tvak Prasadana property of kshira acts on karatva of the skin and also combats vata prakopa there by reduce the ruksha, kharatva and krishnatva of the diseases. It is noticed that lipids have better absorption through skin than water.

Tikta Rasa Usna virya of the both Jatiphala and Javitri mitigates Vata dosa and the same time it stimulates Bhrajaka pitta and help in scraping of the rough, thick, black dark layers formed on the skin. The laghu guna, Tikshna guna and Usna virya properties along with Katu rasa clears the channels helping the healthy Bhrajaka pitta and opens of the free movement of Bhrajaka pitta on to the skin. Bhrajaka pitta is responsible for Varna, chayya, prabha.

त्वक्स्थं भ्राजकं भ्राजनात्त्वचः ॥ (A.H.Su.12/14).

i.e., pitta located in the skin is bhrajaka, because it helps exhibition of colour (and complexion).

Prabha and Chhaya also affect on Varna.

Describing the characteristics of Prabha Acharya Charaka has written that –

Prabha is said to be highlighter of complexion.

भास्तु वर्णप्रकाशिनी । (C.S.In. 7/16)

i.e. Prabha shines out from a distance.

भाः प्रकृष्टा प्रकाशते । (C.S.In.7/16).

Myristicin present in (the both Jatiphala and Javitri, is known to be useful in reducing the production of melanin secretion in skin. It also has antioxidant properties which acts on free radicals produce by nidana mentioned earlier.

It was also observed that the Jatiphala and Javitri have got exfoliating property, which help in formation of new fresh healthy skin removing unhealthy layer. Kshiram play synergetic action by helping for the formation of new healthy layers, this is stimulated with the help of kashaya rasa, which is known for ropana property. The drug was given in the form of pesitha

which help in micro absorption by stimulus in micro circulation as the molecules of the drug are disintegrate in to the finest particles.

The lepa is applied against the growth of hair follicles and the circulation helps in easy absorption of the drug into the skin.

So, both groups showed improvement in Varna, Kharatva and decrease in Parimana. On comparison of Jatiphala and Javitri, it was found that Jatiphala was better than Javitri through both had improvement in Signs and Symptoms.

Results are favourable and further study needed.

CONCLUSION

In conclusion Jatiphala pesita lepa is more effective than Javitri pesita lepa in Vyanga. The katu, Tikta Rasa of Jatiphala and Javitri removes srotodusti there by helping free movement of healthy Bhrajaka pitta to the skin. Tikta rasa and Usna virya of Jatiphala and Javitri combats Vata dosa there by reducing Kharatva and Krishnatva of skin.

The snigdha, Soumya, Sita and Tvak prasadana properties along with Rasayana property help in reducing Vyanga and skin in more permeable to lipids than aqueous solution. The pesita lepa procedure helps in micro absorption and improves micro circulation of Chemical constituents of both drugs due to the disintegration of drug particles into the finest form.

Phytochemical studies with water and milk showed Jatiphala having Alkaloids, Flavonoids, Fixed oils and Carbohydrates (green colour), Tannins respectively. In the same way Javitri with water and milk showed the presence of Carbohydrates, Tannins, Flavonoids and Carbohydrates (orange colour), Tannins respectively.

The HPTLC studies showed the presence of myristicin in both, total of 58 bands are detected in Jatiphala and 75 bands in Javitri.

The chemical compound ‘Myristicin’ present in it may help to reduce the production of melanin in skin.

The other extra observation done on Jatiphala is when this paste applied on the marks of chicken pox, the marks disappeared. This may be due to exfoliating property because of Tikshna guna, katu, Tikta and Kashaya rasa.

I hope, the preliminary study will give higher scope for further studies in this field in future.