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Research Article

Clinical Evaluation of Mandagni in Amavata

Saini Neera[1], Byadgi P. S.[2*]

[1]Junior Resident, Department of *Vikriti Vigyan*, Faculty of *Ayurveda*, Institute of Medical Sciences, Banaras Hindu University, Varanasi -221005, India
[2*]Assistant Professor, Department of *Vikriti Vigyan*, Faculty of *Ayurveda*, Institute of Medical Sciences, Banaras Hindu University, Varanasi -221005, India

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Abstract

Mandagni is the state of *agni* which cannot digest even little quantity of food in the scheduled time. *Ayurvedic Acharayas* have described that *mandagni* is the root cause of almost diseases. Diminished abhyavaharana shakti, diminished jarana shakti, Yastvalpamapyupayukta annam mahata kalena pachati (Intake of small amount of food digests after long hours), Udara gaurava (Heaviness in abdomen), Shiro gaurava (Heaviness in head), Antra kujanam (Gurgling noise in abdomen), Anaha (Flatulence), Kasa (Cough), Shvasa (Dyspnoea), Praseka (Excess salivation), Chardi (Vomiting or nausea), Mukha shosha (Dryness of mouth), Gatra sadanam (Weakness), Lack of relish of food, repeated episodes Kaphaja vikara, Feeling of more cold, Vibandha (Constipation) and Lack of adjustment to environmental changes are clinical features noticed during mandagni state. *Mandagni* produces *ama* which is an antigen like entity for body and is able to activate autoimmune system. This concept is also applicable for the pathogenesis of *amavata* (Group of joint disorders). A lot of symptoms to assess *mandagni* are given in *Ayurvedic* texts, by these symptoms status of *mandagni* can be diagnosed and progressive states of any disease can be prevented by normalizing the agni. During the description of *amavata nidanas* maximum stress is given on *mandagni* by *Madhava*. Most fundamental and earliest event leading to the pathogenesis of *amavata* is the *mandagni. Amavata* is a syndrome comprises of Arthropathies described under ICD classification 2010. It is a clinical study comprises of 100 cases of Amavata (86 Rheumatoid arthritis patients, 6 Systemic Lupus Erythematosus patients, 5 Reactive Arthritis patients and 3 Ankylosing Spondylitis patients). Patients of Amavata divided into three stages based on duration and assessment of mandagni was done in all the three stages. Present study highlights the state of mandagni in three different stages.

1. INTRODUCTION

According to *Ayurveda, amavata* is a systemic disease where along with the articular symptoms, manifestation of gastrointestinal, cardiac, and renal disturbances are also evident. Gastrointestinal changes are considered primary pathological factors for the development of this disease entity. *Mandagni* is often perverted owing to repeated assaults on the compromised digestion in the form of incompatible diet and in congenial routines [1]. In this context when *vata* gets vitiated due to consumption of *vata* aggravating factors and *ama* develops due to consumption of diet and activities which favors sluggishness of *agni* and favors development of *ama* then both *ama* and *vata* enter the *trika* region and *sandhi pradesha* (Various joints of body) and leads to *stabdhata* (Stiffness) in various body joints. This condition is known as *amavata* [2]. *Amavata* is one of the commonest crippling disorders caused by the impairment of *agni*. *Amavata* further leads to deterioration in the form of physical deformities as well as mental frustration. The term *agni*, in common language, means fire. However, in the context of functioning of living organism, which maintains its integrity and performs its vital activities, by converting – in *pakadi karmas* or biophysical and biochemical processes. Healthy state of body and diseased condition is entirely dependent on *agni*. Three main types of *agni* have been described *Jatharagni* is the main type of *agni*. Its functional place is gastrointestinal tract and causes digestion of food. It gives strength to other *agnis* also. Any disturbance in this causes disturbance in other *agnis* also. Hence it is termed as king of all *agni's*. *Bhutagni* is of five types according to *pancha mahabhuta* and is cause of digestion and metabolism of respective *bhuta* qualities of food. *Dhatvagni* are seven varieties of *dhatu* (Tissue elements) support and sustain the life. Different functional states of *jatharagni* are produced due to influence of dosha. *Mandagni (*Due to influence of *kapha), Tikshnagni* (Due to influence of *pitta), Vishamagni* (Due to influence of *vata) and Samagni (*Influence of equilibrium state of Dosha) [3].Except *samagni* remaining three types of *agnis* causes development of diseases. *Mandagni* is normally found in persons of *kapha prakriti* and develops in others by use of *kaphakara aharavihara* (foods and activities which increases kapha) and gives rise to diseases of *kapha* origin. The number of diseases produced by *mandagni* is more than those produced by *tikshnagni* and *vishamagni*. Hence a categorical statement is that "all diseases are due to *mandagni*. [4-9]

Corresponding Author:
Byadgi P.S., Department of Vikriti Vigyan, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University Varanasi -221005, India.
Email: psbyadgi@rediffmail.com
Mobile no.09450711759, Office no. 05426702168

2. AIM OF STUDY

Assessment of mandagni in all the three stages of Amavata (divided into three stages based on duration).

3. EXPERIMENTAL / METHODOLOGY

3.1 Plan of study

The present study was carried out in the OPDs of *Vikriti Vigyana,* Medicine (Rheumatology) and *Kayachikitsa,* Sir Sunderlal Hospital, Institute of Medical Sciences, Banaras Hindu University,Varanasi-221005. The cases were registered from September 2012 to December, 2013 from OPDs of *Vikriti Vigyana,* Rheumatology and *Kayachikitsa*. Selection of patients was done by using subjective and objective criteria mentioned for the clinical diagnosis of *amavata.* After the diagnosis of *amavata*, assessment of *mandagni* was carried out. Ethical committee clearance was taken from the Institute of Medical Sciences for the present clinical study.

3.2 Inclusion criteria

1. Registered patients belonged to age group > 15 years.
2. Patients who fulfilled the criteria of diagnostic features of *amavata* (*Samanya lakshana and Pravriddha lakshana*)
3. Both male and female patients.

3.3 Exclusion criteria

1. The patients with age below fifteen years.
2. The patients, who did not fulfill *amavata* diagnostic criteria.

Patients who fulfilled the diagnostic criteria of Amavata were selected from the OPDs of *Vikriti Vigyan,* Medicine (Rheumatology) and Kayachikitsa, Sir Sunderlal Hospital, Institute of Medical Sciences, Banaras Hindu University, Varanasi-221005 and these will grouped under three stages based on duration.

Stage 1 -- Duration of Amavata upto six months
Stage 2 -- Duration of Amavata upto one year
Stage 3 -- Duration of Amavata more than one year

Table 1: Diagnostic criteria for the diagnosis of *Samanya lakshana* of *Amavata* [5,10]

S. No.	Symptoms
1	*Daurbalya* (General weakness)
2	*Gauravam hrdayasya* (Heaviness in precordial region)
3	*Trika sandhi pravehakau stabdhama* (Stiffness in multiple joints)
4	*Angamarda* (Bodyache)
5	*Aruchi* (Anorexia)
6	*Trishna* (Thirst)
7	*Alasya* (Lethargy)
8	*Gauravam* (Heaviness)
9	*Jvara* (Fever)
10	*Apaka* (Indigestion)
11	*Shunata anganam* (Swelling)

Table 2: Diagnostic criteria for the diagnosis of *Pravrddha lakshana* of *Amavata* [6,10]

S. No.	Symptom
1	*Hasta padashiro gulpha trika janu Uru sandhi sa rujam shotham* (Pain and swelling in hand, feet, ankle, knee, hip and spinal joints).
2	*Rujyate atyartham* (Excruciating pain)
3	*Vyaviddha iva vrishcika* (Nature of pain is like that of scorpion sting)
4	*Agnidaurbalya* (Hindered digestive mechanism)
5	*Praseka* (Excessive salivation)
6	*Aruchi* (Anorexia)
7	*Gauravam* (Heaviness)
8	*Utsahahani* (Lack of enthusiasm)
9	*Vairasya* (Altered taste in the mouth)
10	*Daham* (Burning sensation)
11	*Bahumutratam* (Excessive urination)
12	*Kukshau kathinatam shulam* (Hardness and pain in abdomen)
13	*Nidraviparyaya* (Disturbed sleep)
14	*Trt* (Thirst)
15	*Chardi* (Nausea)
16	*Bhrama* (Fainting)
17	*Murccha* (Unconsciousness)
18	*Hrd graha* (Stiffness in pericordium)
19	*Vidvibaddhatam* (Constipation)
20	*Jadya* (Stiffness)
21	*Antrakujanam* (intestinal gurgling)
22	*Anaha* (Distension in abdomen)

After diagnosis of disease *amavata* on the basis of symptoms described above, assessment of *mandagni* was done.

Table 3: Diagnostic criteria of *mandagni* [7, 8, 9]

S. No.	Symptoms
1	Diminished *abhyavaharana shakti*
2	Diminished *jarana shakti*
3	*Yastvalpamapyupayukta annam mahata kalena pachati* (Intake of small amount of food digests after long hours)
4	*Udara gaurava* (Heaviness in abdomen)
5	*Shiro gaurava* (Heaviness in head)
6	*Antra kujanam* (Gurgling noise in abdomen)
7	*Anaha* (Flatulence)
8	*Kasa* (Cough)
9	*Shvasa* (Dyspnoea)
10	*Praseka* (Excess salivation)
11	*Chardi* (Vomiting or nausea)
12	*Mukha shosha* (Dryness of mouth)
13	*Gatra sadanam* (Weakness)
14	Lack of relish of food
15	Other *Kaphaja vikara*
16	Feeling of more cold
17	*Vibandha* (Constipation)
18	Lack of adjustment to environmental changes

3.4 Investigational Profile

Patients who fulfilled diagnostic criteria of *amavata* are subjected to undergo laboratory investigations to diagnose type of arthritis/arthropathy as per Modern Medicine.

A. Hematological parameters - Complete blood count (CBC), Erythrocyte sedimentation rate (ESR)
B. Collagen profile including CRP (C-reactive protein), RA factor (Rheumatoid Factor), Anti ccp (Anti-cyclic citrullinated peptide), ANA (Anti Nuclear Antibody), Anti dsDNA (Anti double stranded DNA) tests and HLAB27 (Human Leukocyte Antigen).
C. X-ray of the affected joints.
D. Urine – Routine / microscopic examination

3.5 Statistical Analysis

The data collected was transferred on master chart showing various items/variables in columns and subjects in rows. The analysis of data was done using statistical software SPSS version 16.0 and Chi^2 and Z test was applied.

Statistical Significance

$p < 0.05$ considered as statistically significant and
$p < 0.01$ or $p < 0.001$ as statistically highly significant
$p > 0.05$ not statistically significant.

4. OBSERVATIONS AND RESULTS

Group-1 (n=86) : Rheumatoid Arthritis
Group-2 (n=14) : This group is further divided into 3 subgroups according to the diagnosed disease
Sub-group-1 (n=6) : Systemic Lupus Erythematosus (SLE)
Sub-group-2 (n=5) : Reactive arthritis (Re.A)
Sub-group-3 (n=3) : Ankylosing spondylitis (AS)

Due to less number of cases all three subgroups are included in group 2 these three subgroups were concerned as group-2 collectively.

Note: To compare the incidence of symptoms between two groups, group-1 and group-2, Z test and chi2 test is applied. If Z is > 1.96 means p< 0.05 which shows significant results and vice-versa. If Z > 2.58 it means p< 0.01 which shows highly significant results.

4.1 Indication of significant or non-significant results

When the result is significant it means there is significant difference between two groups for an individual symptom. That symptom may have high frequency either in group-1 or group-2. If the result is non-significant it means the possibility of a particular symptom for its presence or absence is same.

Table 4: Showing the total duration of disease

S. No.	Duration	Total no. of cases	Percentage
1	Stage -1 (< 6 months)	15	15 %
2	Stage -1 (>6 months upto 1 year)	10	10 %
3	Stage -1 (> one year)	75	75 %

Above table reveals that 75% cases belonged to more than 1 year duration followed by less than 6 months in 15% cases and more than 6 months upto 1 year in 10% respectively.

Table 5: Showing the diagnostic criteria for the assessment of *mandagni lakshana* in stage 1 (n=15)

		Group -1 (n=13)	Group-2 (n=2)		
S. No.	**Symptoms**	**RA(n=13)**	**Sub Group-1 (SLE) n=0**	**Sub Group-2 (Reactive arth.) n=1**	**Sub Group-3 (A.S) n=1**
1	Diminished *abhyavaharana shakti*	13 (100%)	0 (0%)	1 (100%)	1 (100%)
2	Diminished *jarana shakti*	13 (100%)	0 (0%)	1 (100%)	1 (100%)
3	*Yastvalpamapyupayukta annam mahata kalena pachati* (Intake of small amount of food digests after long hours)	8 (62%)	0 (0%)	1 (100%)	1 (100%)
4	*Udara gaurava* (Heaviness in abdomen)	13 (100%)	0 (0%)	1 (100%)	1 (100%)
5	*Shiro gaurava* (Heaviness in head)	13 (100%)	0 (0%)	1 (100%)	1 (100%)
6	*Antra kujanam* (Gurgling noise in abdomen)	10 (77%)	0 (0%)	0 (0%)	1 (100%)
7	*Anaha* (Flatulence)	7 (54%)	0 (0%)	1 (100%)	1 (100%)
8	*Kasa* (Cough)	4 (31%)	0 (0%)	1 (100%)	0 (0%)
9	*Shvasa* (Dyspnoea)	12 (92%)	0 (0%)	0 (0%)	1 (100%)
10	*Praseka* (Excess salivation)	12 (92%)	0 (0%)	1 (100%)	0 (0%)
11	*Chardi* (Vomiting or nausea)	8 (62%)	0 (0%)	1 (100%)	0 (0%)
12	*Mukha shosha* (Dryness of mouth)	12 (92%)	0 (0%)	0 (0%)	1 (100%)
13	*Gatra sadanam* (Weakness)	13 (100%)	0 (0%)	1 (100%)	1 (100%)
14	Lack of relish of food	8 (62%)	0 (0%)	0 (0%)	1 (100%)
15	Other *Kaphaja vikara*	11 (85%)	0 (0%)	0 (0%)	1 (100%)
16	Feeling of more cold	11 (85%)	0 (0%)	0 (0%)	1 (100%)
17	*Vibandha* (Constipation)	12 (92%)	0 (0%)	1(100%)	1 (100%)
18	Lack of adjustment to environmental changes	11 (85%)	0 (0%)	0 (0%)	1 (100%)

Group-1 (n=13)

Diminished *abhyavaharana shakti,* diminished *jarana shakti, udara gauravam, shiro gauravam* and *gatra sadanam* were present in all cases i.e (100%) followed by *shvasa, praseka, mukha shosha* and *vibandha* (92%), other *kaphaja vikara*, feeling of more cold and lack of adjustment to environmental changes (85%), *antra kujanam* (77%), *yastvalpamapyupayukta annam mahata kalena pachati*, lack of relish of food and *chardi* (62%), *anaha* (54%), and *kasa* (31%) respectively.

Group-2 (n=2)

Sub-group-1 (n=0)

No patients belonged to this group.

Sub-group-2 (n=1)

Diminished *abhyavaharana shakti,* diminished *jarana shakti*, *yastvalpamapyupayukta annam mahata kalena pachati, udara gauravam, shiro gauravam*, *kasa, praseka* and *gatra sadanam, vibandha, anaha*, *chardi* were present in all cases i.e (100%) followed by *shvasa, mukha shosha,* lack of relish of food, other *kaphaja vikara,* feeling of more cold, *antrakujanam* and lack of adjustment to environmental changes were absent in this subgroup.

Sub-group-3 (n=1)

Diminished *abhyavaharana shakti*, diminished *jarana shakti*, *yastvalpamapyupayukta annam mahata kalena pachati, udara gauravam, shiro gauravam* and *gatra sadanam, vibandha, anaha, shvasa, mukha shosha*, lack of relish of food,other *kaphaja vikara,* feeling of more cold, *antrakujanam* and lack of adjustment to environmental changes were present in all cases i.e (100%) followed absence of *kasa*, *praseka*, and *chardi* observed in these cases.

Table 6: Showing the diagnostic criteria for the assessment of *mandagni lakshana* in stage 2 (n=10)

		Group-1 (n=9)	Group-2 (n=1)		
S. No.	**Symptoms**	**RA(n=9)**	**Sub Gr.1 (SLE) n=1**	**Sub Gr.2 (Re. A) n=0**	**Sub Gr.3 (A.S) n=0**
1	Diminished *abhyavaharana shakti*	9 (100%)	1 (100%)	0 (0%)	0 (0%)
2	Diminished *jarana shakti*	9 (100%)	1 (100%)	0 (0%)	0 (0%)
3	*Yastvalpamapyupayukta annam mahata kalena pachati* (Intake of small amount of food digests after long hours)	9 (100%)	1 (100%)	0 (0%)	0 (0%)
4	*Udara gaurava* (Heaviness in abdomen)	7 (78%)	1 (100%)	0 (0%)	0 (0%)
5	*Shiro gaurava* (Heaviness in head)	7 (78%)	1 (100%)	0 (0%)	0 (0%)
6	*Antra kujanam* (Gurgling noise in abdomen)	7 (78%)	0 (0%)	0 (0%)	0 (0%)
7	*Anaha* (Flatulence)	7 (78%)	0 (0%)	0 (0%)	0 (0%)
8	*Kasa* (Cough)	4 (44%)	1 (100%)	0 (0%)	0 (0%)
9	*Shvasa* (Dyspnea)	9 (100%)	1 (100%)	0 (0%)	0 (0%)
10	*Praseka* (Excess salivation)	8 (89%)	1 (100%)	0 (0%)	0 (0%)
11	*Chardi* (Vomiting or nausea)	5 (56%)	1 (100%)	0 (0%)	0 (0%)
12	*Mukha shosha* (Dryness of mouth)	8 (89%)	0 (0%)	0 (0%)	0 (0%)
13	*Gatra sadanam* (Weakness)	9 (100%)	1 (100%)	0 (0%)	0 (0%)
14	Lack of relish of food	2 (22%)	1 (100%)	0 (0%)	0 (0%)
15	Other *Kaphaja vikara*	6 (67%)	1 (100%)	0 (0%)	0 (0%)
16	Feeling of more cold	8 (89%)	1 (100%)	0 (0%)	0 (0%)
17	*Vibandha* (Constipation)	6 (67%)	1 (100%)	0 (0%)	0 (0%)
18	Lack of adjustment to environmental changes	6 (67%)	1 (100%)	0 (0%)	0 (0%)

Group-1 (N=9) Diminished *abhyavaharana shakti*, diminished *jarana shakti, yastvalpamapyupayukta annam mahata kalena pachati, shvasa*, and *gatra sadanam* were present in all cases i.e (100%) followed by *mukha shosha, praseka* and feeling of more cold (89%), *udara gauravam, shiro gauravam, antrakujanam* and *anaha* (78%), Other *kaphaja vikara, vibandha* and lack of adjustment to environmental changes (67%), *chardi* (56%), *kasa* (44%), and lack of relish of food (22%) respectively.

Group - 2 (N=1)

Sub-group -1 (N=1)
Diminished *abhyavaharana shakti*, diminished *jarana shakti, yastvalpamapyupayukta annam mahata kalena pachati, shvasa,* and *gatra sadanam , praseka*, feeling of more cold, *udara gauravam, shiro gauravam*, other *kaphaja vikara*, *vibandha*, lack of adjustment to environmental changes, *chardi, kasa*, and lack of relish of food (100%) and absence of *mukha shosha, antrakujanam* and *anaha was* observed in this subgroup.

Sub-group - 2
No patients belonged to this group.

Sub-group - 3
No patients belonged to this group.

Table 7: Showing the diagnostic criteria for the assessment of *mandagni lakshana* in stage 3 (n=75)

		Group - 1(n=64)	Group-2 (n=14)			
S. No.	**Symptoms**	**RA(n=64)**	**Sub Gr.1 (SLE) n=5**	**Sub Gr.2 (Re. A) n=4**	**Sub Gr.3 (A.S) n=2**	**Z-value and p-value**
1	Diminished *abhyavaharana shakti*	45 (70%)	5 (100%)	4 (100%)	2 (100%)	Z=5.23, P<0.01
2	Diminished *jarana shakti*	45 (70%)	5 (100%)	4 (100%)	2 (100%)	Z=5.23, P<0.01
3	*Yastvalpamapyupayukta annam mahata kalena pachati* (Intake of small amount of food digests after long hours)	40 (63%)	3 (60%)	4 (100%)	2 (100%)	Z=1.45, P> 0.05
4	*Udara gaurava* (Heaviness in abdomen)	35 (55%)	5 (100%)	3 (75%)	2 (100%)	Z=3.38, P< 0.01
5	*Shiro gaurava* (Heaviness in head)	35 (55%)	5 (100%)	3 (75%)	2 (100%)	Z=3.38, P< 0.01
6	*Antra kujanam* (Gurgling noise in abdomen)	53 (83%)	4 (80%)	2 (50%)	1 (50%)	Z=1.24,P>0.05
7	*Anaha* (Flatulence)	44 (69%)	3 (60%)	4 (100%)	2 (100%)	Z=1.004, P> 0.05
8	*Kasa* (Cough)	25 (39%)	5 (100%)	1 (25%)	2 (100%)	Z=2.31, P<0.05
9	*Shvasa* (Dyspnoea)	49 (77%)	4 (80%)	3 (75%)	1 (50%)	Z=0.278, P> 0.05
10	*Praseka* (Excess salivation)	26 (41%)	2 (40%)	2 (50%)	0 (00%)	Z=0.315, P> 0.05
11	*Chardi* (Vomiting or nausea)	38 (59%)	5 (100%)	2 (50%)	2 (100%)	Z=1.75, P> 0.05
12	*Mukha shosha* (Dryness of mouth)	54 (85%)	4 (80%)	3 (75%)	2 (100%)	Z=0.241, P> 0.05
13	*Gatra sadanam* (Weakness)	62 (97%)	5 (100%)	4 (100%)	2 (100%)	Z=1.40, P> 0.05
14	Lack of relish of food	42 (66%)	3 (60%)	2 (50%)	2 (100%)	Z=0.127, P> 0.05
15	Other *Kaphaja vikara*	47 (73%)	5 (100%)	3 (75%)	1 (50%)	Z=0.700, P> 0.05
16	Feeling of more cold	52 (81%)	5 (100%)	3 (75%)	0 (0%)	Z=0.581, P> 0.05
17	*Vibandha* (Constipation)	53 (83%)	3 (60%)	3 (75%)	1 (50%)	Z=1.24, P> 0.05
18	Lack of adjustment to environmental changes	47 (73%)	5 (100%)	3 (75%)	1 (50%)	Z=0.700, P> 0.05

Group -1 (N=64)
Gatra sadanam was present in 97% cases followed by *mukha shosha* (85%), *antrakujanam* and *vibandha* (83%), feeling of more cold (81%), *shvasa* (77%), other *kaphaja vikara*, and lack of adjustment to environmental changes (73%),diminished *abhyavaharana shakti* and diminished *jarana shakti*,(70%), *anaha* (69%), lack of relish of food (66%), *yastvalpamapyupayukta annam mahata kalena pachati* (63%), *chardi* (59%), *udara gauravam* and *shiro gauravam* (55%), *praseka* (41%) and *kasa* (39%) respectively.

Group-2 (N=2)

Sub-group-1 (N=5)
Diminished *abhyavaharana shakti*, diminished *jarana shakti*, *udara gauravam, shiro gauravam, gatra sadanam, chardi, kasa*, other *kaphaja vikara*, feeling of more cold and lack of adjustment to environmental changes were present in all cases i.e (100%) followed by *antrakujanam, shvasa* and *mukha shosha*(80%), *yastvalpamapyupayukta annam mahata kalena pachati, anaha*, lack of relish of food and *vibandha* (60%) and *praseka* (40%) respectively.

Sub-group - 2 (N=4)
Diminished *abhyavaharana shakti*, diminished *jarana shakti yastvalpamapyupayukta annam mahata kalena pachati, anaha*, and *gatra sadanam* were present in all cases i.e (100%) followed by *udara gauravam, shiro gauravam, shvasa, mukha shosha*, other *kaphaja vikara*, feeling of more cold, *vibandha,* and lack of adjustment to environmental changes (75%), *antrakujanam, praseka*, lack of relish of food and *chardi* (50%) and *kasa* (25%) respectively.

Sub-group - 3 (N=2)
Diminished *abhyavaharana shakti*, diminished *jarana shakti yastvalpamapyupayukta annam mahata kalena pachati, udara gauravam, shiro gauravam, gatra sadanam, anaha, mukha shosha, kasa*, lack of relish of food, and *chardi* were present in all cases i.e (100%) followed by *antrakujanam, shvasa,* other *kaphaja vikara*, *vibandha*, and lack of adjustment to environmental changes (50%) and absence of *praseka* and feeling of more cold was observed in this subgroup.

4.2 Comparison between Group-1 and Group-2
Due to very less registered cases in stage -1 and stage-2 "Z" test could not be applied due to which comparison could not be done.
But in stage -3 "Z" is applied and on comparison – Above table shows that between the all symptoms of *mandagni* in *amavata* i.e diminished *abhyavaharana shakti*, diminished *jarana shakti, udara gauravam, shiro gauravam*, and *kasa* shows significant result which means that there is chances of presence of all these more or less features in Group-1 and Group-2. However, other symptoms of *mandagni* in *amavata* were observed equally in both groups.

Table 8: Inter stage comparison of signs and symptoms of *mandagni lakshana* in three stages

S. No.	Symptoms	Stage 1 (n=15)		Stage 2 (n=10)		Stage 3 (n=75)		Chi2 and p value
		Present	Absent	Present	Absent	Present	Absent	
1	Diminished *abhyavaharana shakti*	15(100%)	0 (0%)	10(100%	0 (0%)	56 (75%)	19(25%)	Chi^2=7.82 p = 0.020
2	Diminished *jarana shakti*	15 (100%)	0 (0%)	10(100%	0 (0%)	56 (75%)	19(25%)	Chi^2e=7.82 p = 0.020
3	*Yastvalpamapyupayukta annam mahata kalena pachati* (Intake of small amount of food digests after long hours)	10 (67%)	5 (33%)	10(100%	0 (0%)	49 (65%)	26(35%)	Chi^2= 5.00 p = 0.082
4	*Udara gaurava* (Heaviness in abdomen)	15 (100%)	0 (0%)	8 (80%)	2 (20%)	45 (60%)	30 (40%)	Chi^2= 9.93 p = 0.007
5	*Shiro gaurava* (Heaviness in head)	15 (100%)	0 (0%)	8(80%)	2(20%)	45 (60%)	30 (40%)	Chi^2= 9.93 p= 0.007
6	*Antra kujanam* (Gurgling noise in abdomen)	11 (73%)	4 (27%)	7 (70%)	3 (30%)	60 (80%)	15 (20%)	Chi^2= 0.738 p = 0.691
7	*Anaha* (Flatulence)	9 (60%)	6 (40%)	7 (70%)	3 (30%)	53 (71%)	22 (29%)	Chi^2= 0.670 p = 0.715
8	*Kasa* (Cough)	5 (33%)	10(67%)	5 (50%)	5 (50%)	33 (44%)	42 (56%)	Chi^2= 0.802 p = 0.670
9	*Shvasa* (Dyspnoea)	13 (87%)	2 (13%)	10(100%	0 (0%)	57 (76%)	18 (24%)	Chi^2= 3.07 p= 0.215
10	*Praseka* (Excess salivation)	13 (87%)	2 (13%)	7 (70%)	3 (30%)	30 (40%)	45 (60%)	Chi^2= 12.7 p = 0.002
11	*Chardi* (Vomiting or nausea)	9 (60%)	6 (40%)	6 (60%)	4 (40%)	47 (63%)	28 (37%)	Chi^2= 0.566 p = 0.972
12	*Mukha shosha* (Dryness of mouth)	13 (87%)	2 (13%)	8(80%)	2 (20%)	63 (84%)	12 (16%)	Chi^2= 0.198 p= 0.906
13	*Gatra sadanam* (Weakness)	15 (100%)	0 (0%)	10(100%	0 (0%)	73 (97%)	2 (3%)	Chi^2= 0.680 p= 0.712
14	Lack of relish of food	9 (60%)	6 (40%)	3 (30%)	7 (70%)	49 (65%)	26 (35%)	Chi^2= 4.64 p = 0.098
15	Other *Kaphaja vikara*	12 (80%)	3 (20%)	7 (70%)	3 (30%)	56 (75%)	19 (25%)	Chi^2= 0.338 p = 0.845
16	Feeling of more cold	12 (80%)	3 (20%)	9 (90%)	1 (10%)	60 (80%)	15 (20%)	Chi^2= 0.585 p = 0.746
17	*Vibandha* (Constipation)	13 (87%)	2 (13%)	7 (70%)	3 (30%)	60 (80%)	15 (20%)	Chi^2= 1.04 p = 0.594
18	Lack of adjustment to environmental changes	12 (80%)	3 (20%)	7 (70%)	3 (30%)	56 (75%)	19 (25%)	Chi^2= 0.338 p = 0.845

Among the symptoms of *mandagni* in *amavata* - diminished *abhyavaharana shakti,* diminished *jarana shakti, udara gauravam, shiro gauravam*, and *praseka* shows the significant result it means that there is chances of presence or absence of all these features in stage-1 or stage-2 or stage-3. However, other symptoms of *mandagni* in *amavata* were observed equally in all three stages of *amavata.*
Diminished *abhyavaharana shakti*, diminished *jarana shakti*, are more dominant symptoms in stage-1 and stage -2 (100%) followed by stage-3 (75%) respectively. *Udara gaurava* and *shiro gauravam* are more dominant symptoms in stage-1 (100%) followed by stage-2 (80%) and stage-3 (60%) respectively. *Praseka* is more dominant symptom in stage-1 (87%) followed by stage-2 (70%) and stage-3 (40%) respectively.

Table 9: Showing the RA Factor titer in diagnosed *amavata* patients (n=100)

S. No.	RA Factor titer	Evaluation	Total number of individual	Percentage
1	> 20 IU/ml	Positive	86	86
2	< 20 IU/ml	Negative	14	14

Out of 100 registered cases 14% cases had the RA Factor titer within normal range while 86% cases had the RA Factor titer more than 20 IU/ml which shows an positive result and these patients diagnosed as patients of Rheumatoid Arthritis.

Table 10: Showing the C - reactive protein value in diagnosed *amavata* patients (n=100)

S. No.	C-Reactive Protein value	Evaluation	Total number of individual (n=100)	Percentage
1	> 0.6mg/dl	Positive	91	91
2	< 0.6mg/dl	Negative	9	9

Out of 100 registered cases 09% cases had the C - reactive protein value within normal range while 91% cases had the C-reactive protein value more than 0.6 mg/dl which shows a positive result showing the process of inflammation. When an inflammatory process is present, the high proportion of fibrinogen in the blood causes red blood cells to stick to each other. Abnormal interaction of *vata, kapha, ama*, environmental factors and the immune system individually or combined together causes raised C - reactive protein. Increased C - reactive protein indicates inflammatory reaction inside the body.

Table 11: Showing the Anti CCP value in misdiagnosed *amavata* patients as Rheumatoid Arthritis (n=35)

S. No.	Anti CCP	Evaluation	Total number of individual (n=35)	Percentage
1	> 25 U/ml	Positive	29	83
2	< 25U/ml	Negative	6	17

Out of 35 registered cases 17% cases had the Anti CCP value within normal range while 83% cases had the Anti CCP value more than 25U/ml which shows an positive result and helped in making diagnosis. Anti-CCP antibodies are potentially important surrogate markers for diagnosis and prognosis in rheumatoid arthritis (RA), because they: are as sensitive as, and more specific than, IgM rheumatoid factors (RF) in early and fully established disease and may predict the eventual development into RA when found in undifferentiated arthritis and these are a marker of erosive disease in RA and it may be detected in healthy individuals years before onset of clinical RA.

Table 12: Showing the Anti Nuclear Antibody assay in diagnosed *amavata* patients (n=14)

S. No.	Anti Nuclear Antibody	Evaluation	Total number of individual (n=14)	Percentage
1.	>1.4	Positive	10	71
2.	< 1	Negative	4	29
3.	1-1.4	Equivocal	0	0

Out of 14 registered cases 71% cases had the anti nuclear antibody test showing positive result while 29% cases had the anti nuclear antibody test showing negative result. The immune system makes an abundance of proteins called antibodies. Antibodies are made by white blood cells and they recognize and combat infectious organisms in the body. Sometimes these antibodies make a mistake, identifying normal, naturally-occurring proteins in our bodies as being "foreign" and dangerous. The antibodies that target “normal” proteins within the nucleus of a cell are called antinuclear antibodies (ANA). ANAs could signal the body to begin attacking itself which can lead to autoimmune diseases, including lupus, scleroderma, Sjögren's syndrome, polymyositis / dermatomyositis, mixed connective tissue disease, drug-induced lupus, and autoimmune hepatitis. A positive ANA can also be seen in juvenile arthritis. Abnormal interaction of *vata, kapha, ama*, environmental factors and the immune system individually or combined together may be responsible for this.

Table 13: Showing the Anti dsDNA antibody test in diagnosed *amavata* patients (n=10)

S. No.	Anti dsDNA	Evaluation	Total number of individual	Percentage
1.	> 55 IU/ml	Positive	6	60
2.	< 35 IU/ml	Negative	4	40
3	35-55 IU/ml	Equivocal	0	0

Out of 10 registered cases which were suspected to have other autoimmune disease, 60% cases had the Anti dsDNA antibody assay showing positive result while 40% cases had the Anti dsDNA antibody assay showing negative result. Anti-dsDNA antibodies are a group of anti-nuclear antibodies and their target antigen is double stranded DNA. Anti-dsDNA antibodies are incredibly specific for SLE, with studies quoting nearly 100%, and are therefore used in the diagnosis of SLE. Higher titres of anti-dsDNA antibodies are more suggestive of SLE and lower titres can be found in people without the disease. Patients with rheumatoid arthritis can develop anti-dsDNA antibodies; however they are usually treatment related. Infection with viral pathogens can induce anti-dsDNA antibodies transiently. There is little evidence supporting the association between anti-dsDNA antibodies and other diseases. Abnormal interaction of *vata, kapha, ama*, environmental factors and the immune system individually or combined together may be responsible for this.

Table 14: Showing the HLA B27 genotyping result in diagnosed *amavata* patients (n=8)

S. No.	HLA B27	Total number of individual	Percentage
1.	Positive	5	62
2.	Negative	3	38

Out of 08 registered cases 62% cases had the HLA B27 positive result while 38% cases had the HLA B27 negative result. The relationship between HLA-B27 and many diseases has not yet been fully elucidated. Though it is associated with a wide range of pathology, particularly seronegative spondyloarthropathy, it does not appear to be the sole mediator in development of disease. For example, while 90% of people with ankylosing spondylitis (AS) are HLA-B27 positive, only a fraction of people with HLA-B27 ever develop AS. There are additional genes being discovered that also predispose to AS and associated diseases. Additionally there are potential environmental factors (Triggers) that may also play a role in susceptible individuals.

Table 15: Showing Twenty four hours protein measurement in diagnosed SLE patients (n=6)

S. No	Urine protein of 24 hours in mg/dl in SLE Diagnosed patient (n=6)	Total number	%
1.	Normal	0	00%
2.	Increased	6	100%

100% patients had increased amount of twenty four hours protein**.** The kidney is the most commonly involved visceral organ in SLE. Although only approximately 50% of patients with SLE develop clinically evident renal disease, biopsy studies demonstrate some degree of renal involvement in most patients.

5. DISCUSSION

Healthy state of body and diseased condition is entirely dependent on *agni*. Simultaneous and continuous circulation of *rasadhatu* takes place all over the body by the help of *vyana vata*. If any abnormality evolved in the *rasavaha srotas* (channels carrying rasa) as a result disease manifest like cloud in the sky brings rain. In the same way abnormality in *dosha,* manifest diseases. Once the empty spaces (*Srotas*) become abnormal, it brings abnormality in normal *dhatu* by not transporting to required destination; this is because of the abnormality in *srotas*. *Srotas* vitiates other *srotas*, *dhatus* vitiates other *dhatus*, and for all these happenings disturbed *dosha* are responsible. *Dosha* (Body humors) get aggravated by the disturbed functions of *agni*. That’s why life span, health, strength and nourishment etc. are depends on *agni*. *Amavata* has been named because it develops due to conglomeration *ama and vata*. In different literature, following etymological derivations are found for *amavata*. According to *Kaviraj Gananathasen*, when *apakva annarasa* combines with *vata* develops condition termed as *rasavata*. The improperly formed *annarasa* is *ama* and it cause vitiation of *vata* which is known as *amavata*. The term *amavata* is the combination of *ama* with *vata*. In this *ama* acts like an antigen produced in the body and *vata* is one of the three *dosha*s which is aggravated and vitiated in this disease. There is variation in various proportions of *doshic* influence in the disease manifestation along

with active role of *ama*. Hence variations in the signs and symptomatology of *amavata*, mandagni *lakshana* in *amavata* in three stages of *amavata* were observed. *Amavata* results from the complex interactions between *vata, kapha, ama*, environmental factors and the immune system and all these factors substantially influence in the development of disease and accordingly symptoms and signs of disease manifest. Variations of symptoms and signs of *amavata mandagni lakshana* in *amavata* were observed because of dominance of *vata, kapha, ama*, environmental factors and the immune system individually or combined together influence the disease process in various stages of *amavata*. Further it may be concluded that *amavata* may be correlated to Rheumatoid Arthritis, Systemic Lupus Erythematosus (SLE), Reactive arthritis (Re.A) and Ankylosing spondylitis (AS). So it can be concluded that *amavata* is a syndrome comprises of Arthropathies described under ICD classification 2010.

6. CONCLUSION

Mandagni (hypofunctioning state of *agni*) produces heaviness in abdomen, stasis of food for long period inside etc. *It* is the root cause of almost all diseases. It also produces *ama* which is an antigen like entity for body and is able to activate autoimmune system and plays major role in the pathogenesis of *amavata* (joint disorders). Most fundamental and earliest change observed in the pathogenesis of *amavata* is the *mandagni*. Diminished abhyavaharana shakti, diminished jarana shakti, Yastvalpamapyupayukta annam mahata kalena pachati (Intake of small amount of food digests after long hours), Udara gaurava (Heaviness in abdomen), Shiro gaurava (Heaviness in head), Antra kujanam (Gurgling noise in abdomen), Anaha (Flatulence), Kasa (Cough), Shvasa (Dyspnoea), Praseka (Excess salivation), Chardi (Vomiting or nausea), Mukha shosha (Dryness of mouth), Gatra sadanam (Weakness), Lack of relish of food, repeated episodes Kaphaja vikara, Feeling of more cold, Vibandha (Constipation) and Lack of adjustment to environmental changes are clinical features noticed during mandagni state. *Amavata* is a syndrome comprises of Arthropathies described under ICD classification 2010. It is a clinical study comprises of 100 cases of Amavata (86 Rheumatoid arthritis patients, 6 Systemic Lupus Erythematosus patients, 5 Reactive Arthritis patients and 3 Ankylosing Spondylitis patients). Patients of Amavata divided into three stages based on duration and assessment of mandagni was done in all the three stages. Present study highlights the state of mandagni in three different stages. It was observed that all the cases of Amavata were suffered from mandagni in all three stages.

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