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Research Article

CLINICAL CORRELATION OF *AMAVATA* WITH ARTHROPATHIES

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ABSTRACT

Objective: The objective of the study was to evaluate the disease *Amavata* with current understanding of International Classification of Diseases (ICD) 2010.

Methods: For the present clinical study, a total of 100 patients were selected. Selection of the patients was done using subjective criteria (mentioned in *Ayurvedic samhitas*) to diagnose *Amavata.* Moreover, these patients were classified into three stages according to duration (<6 months, more than 6 months, more than 1 year) of disease. Laboratory investigations were advised such as hematological parameters and collagen profile.

Results: A total of 100 cases of *Amavata* were divided into two groups based on ICD classification 2010. 86 cases of *Amavata* patients were diagnosed as rheumatoid arthritis including all the three stages. 14 cases of *Amavata* were diagnosed as systemic lupus erythematosus, reactive arthritis, and ankylosing spondylitis including all the three stages.

Conclusion: *Amavata* is a syndrome may be correlated to arthropathies described under ICD classification 2010.

Keywords: *Amavata,* Rheumatoid arthritis, Systemic lupus erythematosus, Reactive arthritis, Ankylosing spondylitis.

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INTRODUCTION

Due to consumption of *Vata, Pitta,* and *Kapha* aggravating factors [1] and substances which favors the formation of *Ama* causes sluggish functions of *Agni* and develops *Ama* inside the gastrointestinal tract [2] and enters the *Trika* region (joints where more than two bones unite to form an anatomical structure called *Trika Sandhi*) and *Sandhi pradesha* (various joints of body) causing *Stabdhata* (stiffness) in joints leading to genesis of *Amavata* [3]. *Amavata* is considered as rheumatoid arthritis (RA) only since a long period but other diseases mentioned under arthropathies also fulfills the diagnostic criteria of *Amavata*. The aim of this study is to evaluate the disease *Amavata* with current understanding of International Classification of Diseases 2010.

METHODS

Study design

Selection of the patients was done using subjective criteria mentioned for the clinical diagnosis of *Amavata*, and all the selected patients were advised to undergo ancillary investigation to diagnose the diseases from current perspectives.

On the basis of duration of disease all the patients were divided into three stages.

- Stage 1: Duration <6 months
- Stage 2: Duration more than 6 months but <1 year
- Stage 3: Duration more than 1 year.

Inclusion criteria

a. Registered patients belonged to age group >15 years
b. Patients who fulfilled the criteria of diagnostic features of *Amavata* (*Samanya Lakshana* and *Pravriddha Lakshana*).

Exclusion criteria

a. Patients with age below 15 years
b. Patients, who did not fulfill *Amavata* diagnostic criteria.

Selection of the patients was done from September 2012 to March 2013 from the *Vikriti Vigyan* and Rheumatology OPDs.

Ethical committee

Ethical clearance was taken from the institutional ethics committee.

Diagnostic criteria of *Samanya Lakshana* of *Amavata* [4]

Daurbalya (weakness), *Gauravam hridayasya* (heaviness in precordial region), *Trika Sandhi Praveshakau Stabdham* (stiffness in joints), *Angamarda* (bodyache), *Aruchi* (anorexia), *Trishna* (thirst), *Alasya* (lethargy), *Gauravam* (heaviness), *Jvara* (fever), *Apaka* (indigestion), and *Shunata Anganam* (swelling).

Specific or *Pravriddha Lakshana of Amavata* [3]

Hasta Padashiro Gulpha Trika Janu Uru Sandhi Sa Rujam Shotham (pain and swelling in hand, feet, ankle, knee, hip, and spinal joints), *Rujyate Atyartham* (excruciating pain), *Vyaviddha Iva Vrishcika* (pain like scorpion sting), *Agnidaurbalya* (hindered digestive mechanism), *Praseka* (excessive salivation), *Aruchi* (anorexia), *Gauravam* (heaviness), *Utsahahani* (lack of enthusiasm), *Vairasya* (altered taste of mouth cavity), *Daham* (burning sensation), *Bahumutratam* (excessive urination), *Kukshau Kathinatam Shulam* (hardness and pain in abdomen), *Nidraviparyaya* (disturbed sleep), *Trit* (thirst), *Chardi* (nausea), *Bhrama* (fainting), *Murccha* (unconsciousness), *Hrid Graha* (stiffness in pericordium), *Vidvibaddhatam* (constipation), *Jadya* (stiffness), *Antrakujanam* (intestinal gurgling), and *Anaha* (distension in abdomen).

Investigation profile

- Hematological parameters - Complete blood count, erythrocyte sedimentation rate.
- Collagen profile including C-reactive protein, rheumatoid factor, anticyclic citrullinated peptide (CCP), antinuclear antibody, antidouble stranded DNA tests, and human leukocyte antigen (HLA) B27.

Statistical analysis
Chi-squared test and Z test were used to compare the incidence of symptoms between two groups.

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

OBSERVATION AND RESULTS

Stage 1: Total 15 cases of *Amavata* patients were belonged to <6 months duration.
Stage 2: Total 10 cases of *Amavata* patients were belonged to more than 6 months duration.
Stage 3: Total 75 cases of *Amavata* patients were belonged to more than 1 year duration.

A total of 100 cases of *Amavata* were subjected to complete blood count, erythrocyte sedimentation rate, and collagen profile. On the basis of investigation report *Amavata* patients divided into two groups.

Group A (n=86): RA. 13 cases of Stage 1, 9 of Stage 2 and 64 of Stage 3.

Group B (n=14): Comprises systemic lupus erythematosus (SLE), reactive arthritis (Re.A), and ankylosing spondylitis (AS), and these were further subdivided into subgroups.

Table 1: Age wise distribution of the *Amavata* patients (n=100)

S. No.	Age group (years)	Total (%)
1	15-24	4 (4)
2	25-34	36 (36)
3	35-44	28 (28)
4	45-54	24 (24)
5	55-64	8 (8)

This group was further divided into three subgroups based on their number.
Subgroup 1 (n=6): SLE divided as 1 of Stage 2, 5 of Stage 3.
Subgroup 2 (n=5): Re.A divided as 1 of Stage 1, and 4 of Stage 3.
Subgroup 3 (n=3): AS divided as 1 of Stage 1 and 2 of Stage 3.

Due to less number of cases in all three subgroups of Group 2, statistical analysis was analyzed as Group 2 in different stages.

36% cases of *Amavata* were observed in the age group of 25-34 years (Table 1).

84% patients of RA were females. 100% patients of SLE were females (Table 2).

Assessment of *Samanya Lakshana* of *Amavata*

I. In Stage 1 (n=15)
   - Group A (n=13) - *Trika Sandhi Pravehakau Stabdham*, *Jvara*, *Apaka* and *Shunata Anganama* were present in all cases (100%) followed by *Daurbalya* and *Alasya* (92%).
   - Group B (n=2):
     Subgroup 1 (n=0) has no case.
     Subgroup 2 (n=1) Patient has all symptoms except *Trishna* and *Aruchi*.
     Subgroup 3 (n=1) Patient has all symptoms except *Gauravam Hrdayasya*, *Trishna* and *Jvara.*
II. In Stage 2 (n=10)
   - Group A (n=9) – maximum symptoms were present in all cases, i.e., 100%).
   - Group B (n=1):
     Subgroup 1 (n=1): Patient has all symptoms except *Trishna* and *Jvara*.
     Subgroup 2 and Subgroup 3 (n=0): No cases.
III. In Stage 3, n=75 showing in Table 3.

Group A (n=64)
Angamarda was present in all cases, i.e., 100%, followed by followed by *Daurbalya, Trika sandhi praveshakau stabdham* and *Shunata anganama* (97%), *Apaka* (94%), *Alasya* (92%), *Aruchi* (73%), *Jvara* (64%), *Gauravam* (63%), *Trishna* (41%), and *Gauravam hridayasya* (25%).

Table 2: Sex wise distribution in the two groups of *Amavata* (n=100)

Sex	Group 1 (n=86) RA (%)	Group 2 (n=14)			Total
		Subgroup 1 SLE (n=6) (%)	Subgroup 2 Re.A (n=5) (%)	Subgroup 3 A.S (n=3) (%)	n=100 (%)
Male	14 (16)	0 (0)	2 (40)	2 (66)	18 (18)
Female	72 (84)	6 (100)	3 (60)	1 (33)	82 (82)

SLE: Systemic lupus erythematosus, Re.A: Reactive arthritis, AS: Ankylosing spondylitis, RA: Rheumatoid arthritis

Table 3: Assessment of *Samanya Lakshana* of *Amavata* in Stage 3 (n=75) and comparison of symptoms between two groups

S. No.	Symptoms	Group A (n=64)	Group B (n=11)			Z value and p value
		RA n=64 (%)	Subgroup 1 (SLE) n=5 (%)	Subgroup 2 (Re.A) n=4 (%)	Subgroup 3 (AS) n=2 (%)	
1	*Daurbalya*	62 (97)	5 (100)	4 (100)	2 (100)	Z=1.40, p>0.05
2	*Gauravam Hrdayasya*	16 (25)	3 (60)	1 (25)	2 (100)	Z=1.88, p>0.05
3	*Trika Sandhi Praveshakau Stabdham*	62 (97)	5 (100)	4 (100)	2 (100)	Z=1.40, p>0.05
4	*Angamarda*	64 (100)	5 (100)	4 (100)	2 (100)	Z=0, p>0.05
5	*Aruchi*	47 (73)	5 (100)	4 (100)	2 (100)	Z=4.86, p<0.01
6	*Trishna*	26 (41)	4 (80)	3 (75)	1 (50)	Z=2.17, p<0.05
7	*Alasya*	59 (92)	5 (100)	4 (100)	2 (100)	Z=2.35, p<0.05
8	*Gauravam*	40 (63)	5 (100)	4 (100)	1 (50)	Z=2.6, p<0.01
9	*Jvara*	41 (64)	5 (100)	4 (100)	2 (100)	Z=6, p<0.01
10	*Apaka*	60 (94)	5 (100)	4 (100)	2 (100)	Z=2.02, p<0.05
11	*Shunata Anganama*	62 (97)	5 (100)	4 (100)	2 (100)	Z=1.40, p>0.05

SLE: Systemic lupus erythematosus, Re.A: Reactive arthritis, AS: Ankylosing spondylitis, RA: Rheumatoid arthritis

Group B (n=11)

Subgroup 1 (n=5)

Most of symptoms were present in all cases, i.e., 100%.

Subgroup 2 (n=4)

Most of symptoms were present in all cases, i.e., 100%.

Subgroup 3 (n=2)

Most of symptoms were present in all cases, i.e., 100%.

Comparison between Group 1 and Group 2

Due to very less registered cases in Stage 1 and 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 – Table 3 shows that between the all symptoms of *Amavata* as *Alasya, Aruchi, Trishna, Gauravam, Jvara*, and *Apaka* show significant result.

Assessment of *Pravriddha Amavata Lakshana* of *Amavata*

I. In Stage 1 (n=15)
- Group A (n=13): *Hasta Padashiro Gulpha Trika Janu Uru Sandhishau Sarujam Shotham, Rujyate Atyartham*, *Vyaviddha Iva Vrishcika*, *Agnidaurbalya*, *Daham* and *Jadya* were present in all cases i.e., (100%).
- Group B (n=2):
  Subgroup 1 (n=0): 0 patients were belonged to this group.
  Subgroup 2 (n=1): Most of symptoms were present, i.e., 100%.
  Subgroup 3 (n=1): Most of symptoms were present, i.e., 100%.

II. In Stage 2 (n=10)
- Group A (n=9): *Agnidaurbalya, Gauravam, Utsahahani, Bahumutratam*, and *Hrid Graha* were present in all cases, i.e., 100%, followed by *Hasta Padashiro Gulpha Trika Janu Uru Sandhishau Sarujam Shotham* and *Rujyate Atyartham* (96%).
- Group B (n=1):
  Subgroup 1 (n=1): Most of symptoms were present i.e. (100%).
  Subgroup 2 and Subgroup 3 (n=0): 0 patients were belonged to this group.

III. In Stage 3 (n=75) showing in Table 4.

Group 1 (n=64)

Hasta Padashiro Gulpha Trika Janu Uru Sandhishau Sarujam Shotham, *Rujyate Atyartham, Utsahahani* and *Jadya* were present in 97% cases, i.e., followed by *Agnidaurbalya* (94%).

Group 2 (n=11)

Subgroup 1 (n=5)

Most of symptoms were present in all cases, i.e., 100%.

Subgroup 2 (n=4)

Most of symptoms were present in all cases, i.e., 100%.

Subgroup 3 (n=2)

Most of symptoms were present in all cases, i.e., 100%.

Comparison between Group 1 and Group 2

In Stage 3, "Z" test is applied and on comparison it was observed that between the all symptoms of *Pravriddha Amavata Agnidaurbalya, Aruchi, Gauravam, Kukshaukathinatama Shulam,* and *Trit* show significant result.

Observation on objective criteria

Out of 100 patients of *Amavata* the erythrocyte sedimentation rate was within normal limit in 11 cases, ESR was increased in 29 cases, i.e. >20mm in 1st hr and high ESR value, i.e., >40 mm in 1st hr was observed in 60 cases (Table 5).

RA factor titer was higher in 86 cases and it was within normal limit in 14 cases (Table 6).

C-reactive protein value was higher in 91 cases and it was within normal limit in 9 cases (Table 7).

Table 8 shows that out of 35 registered cases 17% cases had the anti-CCP value within normal range while 83% cases had the anti-CCP

Table 4: Assessment of *Pravriddha Lakshana* of *Amavata* in Stage 3 (n=75) and comparison of symptoms between 2 groups

S. No.	Symptoms	Group 1(n=64)	Group 2 (n=11)			Z value and p value
		RA n=64 (%)	Subgroup 1 (SLE) n=5 (%)	Subgroup 2 (Re.A) n=4 (%)	Subgroup 3 (AS) n=2 (%)	
1	*Hasta Padashiro Gulpha Trika Janu Uru Sandhishau Sarujam Shotham*	62 (97)	5 (100)	4 (100)	2 (100)	Z=1.40, p>0.05
2	*Rujyate Atyartham*	62 (97)	5 (100)	4 (100)	2 (100)	Z=1.40, p>0.05
3	*Vyaviddha Iva Vrishcika*	57 (89)	5 (100)	4 (100)	0 (0)	Z=0.572, p>0.05
4	*Agnidaurbalya*	60 (94)	5 (100)	4 (100)	2(100)	Z=2.02, p<0.05
5	*Praseka*	26 (41)	2 (40)	2 (50)	0 (0)	Z=0.317, p>0.05
6	*Aruchi*	47 (73)	5 (100)	4 (100)	2 (100)	Z=4.86, p<0.01
7	*Gauravam*	40 (53)	5 (100)	4 (100)	1 (50)	Z=3.56, p<0.01
8	*Utsahahani*	62 (97)	5 (100)	4 (100)	2 (100)	Z=1.40, p>0.05
9	*Vairasya*	42 (66)	3 (60)	3 (75)	0 (0)	Z=0.682, p>0.05
10	*Daham*	57 (89)	5 (100)	4 (100)	0 (0)	Z=0.572, p>0.05
11	*Bahumutratam*	34 (53)	3 (60)	1 (25)	2 (100)	Z=0.123, p>0.05
12	*Kukshau Kathinatam Shulam*	34 (53)	5 (100)	2 (50)	2 (100)	Z=2.02, p<0.05
13	*Nidraviparyaya*	47 (73)	5 (100)	3 (75)	1 (50)	Z=0.700, p>0.05
14	*Trit*	26 (35)	4 (80)	3 (75)	1 (50)	Z=2.59, p<0.01
15	*Chardi*	38 (59)	5 (100)	2 (50)	2 (100)	Z=1.75, p>0.05
16	*Bhrama*	53 (83)	5 (100)	3 (75)	2 (100)	Z=0.814, p>0.05
17	*Murccha*	0 (0)	0 (0)	0 (0)	0 (0)	0
18	*Hrid Graha*	16 (25)	3 (60)	1 (25)	2 (100)	Z=1.88, p>0.05
19	*Vidvibaddhatam*	53 (83)	3 (60)	3 (75)	1 (50)	Z=1.24, p>0.05
20	*Jadya*	62 (97)	5 (100)	4 (100)	2 (100)	Z=1.40, p>0.05
21	*Antrakujanam*	53 (83)	4 (80)	2 (50)	1 (50)	Z=1.24, p>0.05
22	*Anaha*	44 (69)	3 (60)	4 (100)	2 (100)	Z=1.004, p>0.05

SLE: Systemic lupus erythematosus, Re.A: Reactive arthritis, AS: Ankylosing spondylitis, RA: Rheumatoid arthritis

value more than 25 U/ml which shows an positive result and helped in making diagnosis.

Higher value of ANA indicates patient may be suffering from any other autoimmune disease (Table 9).

Higher value of anti-dsDNA favors the presence of SLE (Table 10).

Out of 8 cases about 62% cases had the HLA B27 positive result while 38% cases had the HLA B27 negative result. These patients were diagnosed as - 3 patients of Re.A with HLA B27 positive and 5 cases of A.S (2 cases with HLA B27 positive and 3 cases with HLA B27 negative) (Table 11).

DISCUSSION

Amavata results from the complex interactions between *Vata, Kapha, Ama*, environmental factors, and the immune system. Improper diet and lifestyle disturbs the leads to abnormal homeostasis of *Doshas* resulting into sluggish functions of *Agni* leading to development of *Ama* .

Ama combines with agitated *Vata* moves to *Kaphasthanas* and develops the disease *Amavata.*

A total of 100 registered cases who fulfilled the diagnostic criteria of *Amavata* (*Samanya lakshana* and *Pravriddha lakshana*) were classified into three stages based on duration, i.e., Stage 1: Duration of disease less than 6 months, Stage 2: Duration of disease from >6 months to 1 year, and Stage 3: Duration of disease more than 1 year. About 100 patients of *Amavata* were further divided into following groups based on the objective criteria that fulfilled the diagnosis of respective diseases, i.e., Group 1, 86 patients of *Amavata* were diagnosed as RA, 6 patients were diagnosed as SLE; 5 patients were diagnosed as Re.A and 3 patients were diagnosed as AS. It may be concluded that *Amavata* is a syndrome and may be correlated to arthropathies mentioned in modern medicine. Table 1 shows that 36% patients were of 25-34 years age group followed by 28% patients were of 35-44 years age group. It has mentioned that onset of the majority of the arthropathy were frequently diagnosed during the 2nd and 4th decades of life [5]. 86% patients of *Amavata* were diagnosed as RA and out of these 84 % patients were female which was almost similar to studies conducted by Al- Bishri *et al.* (78% vs. 22%, respectively) and Bajraktari *et al.* (76.8% vs. 23.2%, respectively) [6].It may be due to hormonal factor and sex linked genes. Table 2 shows that 100% cases of diagnosed SLE were female. SLE is a chronic inflammatory disease that has a protean manifestation. More than 90% of cases are seen in women. SLE, an autoimmune disorder characterized by multisystem inflammation with the generation of autoantibodies [7].This study provides the base for research to innovate and select the drugs mentioned for *Amavata* management may be screened to invent the drugs for the better management of challenging arthropthies.

About 86% patients were of RA which has very similar pathogenesis of *Amavata* which is stated by Turnbagh theory. Turnbagh and coworkers suggested that a set of core microbiome is present in humans living in a certain habitat conditions. Variability among individuals could arise due to the host lifestyle, diet, health, immune system, and environment. In this theory, they described that RA is a multifactorial disease and requires interaction between genetic and environmental factors for predisposition. The presence of bacterial DNA of the gut residing commensals in synovium as well as dysbiosis of certain commensal bacteria in fecal samples of RA patients as compared to controls suggest a significant role of the gut flora in pathogenesis of RA [8]. This concept described in *Ayurveda* as erratic diet and lifestyle causes variability in gut due to hindered digestive power as a result disturbed *Agni* yields immature *Rasa (Ama)* in *Amashaya* . It is absorbed in the system and taken up by aggravated and vitiated *Vata* especially to the *Kapha sthana* mainly *Amashaya, Sandhi, Uras, Kantha,* etc., and causes genesis of symptom complex. This concept of *Amavata* pathogenesis may be proved scientifically by this theory.

Table 5: The ESR in diagnosed *Amavata* patients (n=100)

S. No.	ESR range in mm/1st hr	<20	>20	>40
1	Total number of cases	11	29	60

ESR: Erythrocyte sedimentation rate

Table 6: The RA factor titer in diagnosed *Amavata* patients (n=100)

S. No.	RA factor titer	Evaluation	Total number of individual (%)
1	>20 IU/ml	Positive	86 (86)
2	<20 IU/ml	Negative	14 (14)

RA: Rheumatoid arthritis

Table 7: The C-reactive protein value in diagnosed *Amavata* patients (n=100)

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

Table 8: The anti CCP value in misdiagnosed patients *Amavata* as rheumatoid arthritis (n=35)

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

CCP: Cyclic citrullinated peptide

Table 9: The antinuclear antibody assay in diagnosed Amavata patients (n=14) having negative result for RA factor

S. No.	Antinuclear antibody	Evaluation	Total number (n=14)
1	>1.4	Positive	10
2	<1	Negative	4
3	1-1.4	Equivocal	0

RA: Rheumatoid arthritis

Table 10: The anti dsDNA antibody test in diagnosed *Amavata* patients (n=10) having ANA test positive

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

ANA: Antinuclear antibody, dsDNA: Double stranded DNA

Table 11: The HLA B27 genotyping result in diagnosed *Amavata* patients (n=8) with 4 cases with ANA negative and 4 cases with anti dsDNA negative but ANA positive result

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

HLA: Human leukocyte antigen, ANA: Antinuclear antibody, dsDNA: Double stranded DNA

CONCLUSION

It may be concluded that *Amavata* may be correlated to RA, SLE, Re.A, and AS. This clinical study provides vital clue for the management of above arthritis from Ayurveda perspectives based on *Amavata* management principles. Further, it also helps to invent the newer therapeutic combination from the *Amavata* treatment principles to manage these challenging arthropathies.

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