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AN ASSESSMENT OF ĀMAVASTHA AMONG ESR TESTED SUBJECTS AT GOVT. AYURVEDA COLLEGE HOSPITAL LABORATORY, KANNUR, PARIYARAM

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ABSTRACT

Manifestation of *āma Lakshana* is suggestive of a derangement i.e. a transition of the body from physiology towards pathology. Therefore, these *lakshanas* could be considered as an indicator of the inflammatory or infective processes occurring in the body. ESR is a commonly used inflammatory marker especially in the case of chronic inflammations. **Objective:** To assess *āma* status of individuals tested for ESR **at** Govt. Ayurveda College hospital laboratory, Kannur **Method:** 256 patients who performed ESR tests at Govt. Ayurveda College Hospital Laboratory, Kannur, Pariyaram were selected for the study. Their *āma lakshana* was assessed with the help of a questionnaire. Based on the score obtained, the patients were grouped into three, ie, *pravara āma, madhyama āma and avara āma*. **Result:** A statistically significant difference was obtained in the mean ESR values of *pravara āma madhyama āma* and avara āma groups. **Conclusion:** Inflammatory markers could serve as an alternative for *āmavastha* assessment and vice versa. The ESR value and the concept of *āmavastha* may be related and hence may be utilised in clinical practice accordingly**.**

Keywords: *Āma*, ESR, inflammatory markers

INTRODUCTION

The word *Āmaya (*synonym of *vyadhi*)[1]means that which is formed from *āma*. *Āma* as the causative factor for many diseases and *rogavasthas* with *āmanubandha* had been mentioned elaborately in the Ayurvedic literature. According to *Vagbhata, āma* is a substance that is formed due to the hyperfunctioning of *Agni*. As a result, the rasa which is formed due to incomplete digestion of food gets retained in *amasaya* and undergo fermentation and putrefaction[2]. As per *Madhava Nidana, āma* refers to the first stage of *dosa dushti* or *dosha dushya sammurchana*[3]. *Ama* is also referred to as the state of accumulation of waste products of metabolism[4]. *Vagbhata* stated that *amavisa* is a state of toxicosis which result from frequently resorting to *viruddhasana, adhyasana* and *ajeernasana*.[5]*Dalhana* has mentioned that *āma* is also formed as a result of defective *dhtawagni*.[6] *Chakrapani* while commenting on *grahani chikitsa* has mentioned the existence of *āma* in different levels[7].The localisation of *āma* during its circulation through the body is an important factor in the causation of disease[8].

Localised *āma (sthula rupi*) is that which reside at the level of GIT and generalised *āma (sukshma rupi*) is that which occur at the systemic level[9]. The disease caused by *āma* when it is associated with the *doshas* and *dushyas* is generally spoken as *sāmarogas*[10]. The etiological factors of *amotpatthi* are either directly leading to *mandagni* or those which trigger the *doshas* first, thereby leading to *agni mandya* which in turn result in *amotpatthi*[11]. The role of psychological and emotional events in creating *agnimandya* followed by *amotpatthi* is well explained by *Charaka*[12.] According to *Madhavanidana, āma* is a substance that shows the properties such as *avipakwam (*non-transformable), *asamyuktham* (will not coexist) *durgandham* (foul-smelling) *bahu* and *pichila* (slimy) and it causes *sarvagatra sadana (*whole-body pain*)*[13]. In addition, *Arunadatta* has described the properties of *āma as drava, guru, aneka varna, snigdham, tandumat, etc*.[14]

It has been observed that during *sāmavastha* of diseases, certain inflammatory markers are seen to be elevated. Whereas during *niramavastha,* it is also seen that most of the haematological parameters revert to the premorbid state. The role of *rasa dhatu* and *raktha dhatu* in the formation and spread of *āmavastha* is quite known. So haematological parameters indicative of inflammation can help to know about the *avastha* of *vyadhi*.

The *avastha* or stage of the *vyadhi* is a very decisive element in the *samprapti* for proper planning of the interventions. The features suggestive of *āmavastha* may be seen as such in many patients whereas in a majority of patients most of these features may remain as subclinical manifestations. In such cases, the *avastha* of the disease may remain masked i.e. the physician finds it difficult to distinguish between *amavastha* as well as *pakwavastha* of the disease. ESR is a cost-effective haematological test that can be utilised to understand the *vyadhyavastha* in such cases.

Inflammation is a protective mechanism of the body to destroy or neutralise the pathogen involved. Likewise, *āma* is a pathological state of the body by which the body tries to neutralise or expel the āma that is dislodged at various body channels. *Jwara* which is included under the general features of *āma* is produced to destroy the cause of *āma* by elevated body temperature.

Āmavastha of a disease can be measured only in terms of qualitative parameters. If these could be expressed in terms of quantitative data in terms of haematological investigations, it would be of great use in the clinical setting. In case of extremely rural settings, where clinical laboratories are not abundant, or when the economic feasibility of lab investigations arise, the clinician can have a rough idea regarding the inflammatory status of the patients simply by the assessment of *āmavastha*, if a relationship could be identified between the *āma lakshana* and such simple and cost-effective inflammatory markers.

Aim and Objective

To assess the relationship of the status of *āma* with ESR, a haematological parameter

Methodology

- Type of study - Observational (an analytical cross-sectional study)

- Study setting - Govt. Ayurveda College hospital laboratory, Kannur, Pariyaram
- Study population - OP and IP patients who are undergoing lab investigations of ESR and in the hospital laboratory of Govt. Ayurveda College, Kannur
- Sample size - **256**
- Sampling technique- Consecutive sampling

Inclusion criteria

Individuals investigated for ESR in the Govt Ayurveda College laboratory, Kannur

- Irrespective of sex
- Irrespective of age

Exclusion criteria

- Menstruation
- Pregnancy
- Those under medication such as NSAIDs and statins

Materials and methods

- *Āma lakshana* assessment tool

The study was conducted based on a questionnaire developed in the Department of Kayachikitsa, Govt. Ayurveda College, Trivandrum in the dissertation titled 'An observational study to assess the *sama-nirama* stages in various clinical conditions with CBC, ESR and CRP' by Dr Sunil John, Associate Professor, Dept. of Kayachikitsa. Regarding the questionnaire validation process, face validity and content validity has been tested by the developer. This questionnaire is categorised into 10 domains based on which *āmavastha* is assessed which include- General symptoms/*Samanya Lakshana*, Objective signs, Appetite/*Agni* related questions, *Srothas* related questions, Bowel/*Koshta* related questions, Urine/*Mootra* related questions, Sweat/*Sweda* related questions, *Indriya*/sense organs related questions, Psychological/*Manasika* related questions and *Upasaya-anupasaya* related questions.

Evaluation is made based on the total score. A score of 70 and above is diagnosed as severely/*pravara āma* stage, a score between 50 to 69 is taken as moderately/*madhyama āma* and a score below 50 is taken as *avara āma.*

The data were tabulated using SPSS 16.0 and analysed using appropriate statistical tests. Statistical analysis was done by using descriptive statistics. One way ANOVA with Tukey post hoc test was used to find out the ESR status in three groups of *āma* ie, *pravara ama, madhyama ama* and *avara ama.*

Observations and Analysis

Out of 256 subjects, a maximum number of participants were females (66%) while 34% of participants were males. Among 256 participants, 12.9% had *pravara āma lakshana*, 38.3% had *madhyama āma lakshana* and 48.8% had *avara āma lakshana* respectively. Among 256 participants,142 participants had raised ESR while 114 subjects had normal ESR levels. Considering the distribution based on presenting complaints, among the rheumatology patients, 58% of subjects had *āma lakshana* and 67% of subjects had raised ESR. Among head, eye and ENT cases,63% had *āma lakshana* and 68% had raised ESR. Among gynaecology cases, 28.5% had *āma lakshana* and 43% had raised ESR. Among orthopaedic cases,45% had *āma lakshana* and 47% had raised ESR. Among neurology cases,54% had *āma lakshana* and 45%had raised ESR. Among the subjects with chronicity of less than 1 year, 98% had *āma lakshana* and 96% had raised ESR. Among the subjects with chronicity of 1-2 years,94% had *āma lakshana* and 88% had raised ESR. Among the subjects with chronicity of 2-3 years,74% had *āma lakshana* and 76% had raised ESR. Among the subjects with chronicity of 3-4 years,35% had *āma lakshana* and 27% had raised ESR. Among the subjects with chronicity of 4-5 years,17% had *āma lakshana* and 26% had raised ESR. Among the subjects with chronicity of more than 5 years,9% had *āma lakshana* and 36% had raised ESR.

Agni assessment was done by considering the score of selected questions from the *āma* assessment questionnaire. Among the total population, 53.5% had either *mandagni (30.5%) or vishamagni (23%).* Among subjects with *mandagni*, the majority (72%) had raised ESR, and the majority of subjects (73%) had *āma lakshana*. In the case of *vishamagni* 51% had *āma*

lakshana and 56% had raised ESR. Whereas among subjects with *samagni*, the majority (70%) had *avara āma* and the majority (55%) of subjects had normal ESR levels.

Table 1: Distribution of Āma *lakshana* and ESR status according to the system involved

System involved	*Pravara āma*	*Madhyama ama*	*Avara āma*	Raised ESR	Normal ESR
Rheumatology	20%	38%	42%	67%	33%
Head, Eye & ENT	9%	54%	36%	68%	32%
Gynaecology	0	28.5%	71.4%	43%	57%
Orthopaedic	10.5%	34.2%	55.2%	47%	53%
Neurology	6%	48%	46%	45%	55%

Table 2: Distribution of *Āma lakshana* and ESR status according to disease chronicity

Chronicity	*Pravara āma*	*Madhyama āma*	*Avara āma*	Raised ESR	Normal ESR
<1 year	54%	44%	2%	96%	4%
1-2 years	16%	78%	6%	88%	12%
2-3 years	8%	66%	26%	76%	24%
3-4 years	0	35%	65%	27%	73%
4-5 years	0	17%	83%	26%	74%
>5years	0	9%	91%	36%	64%

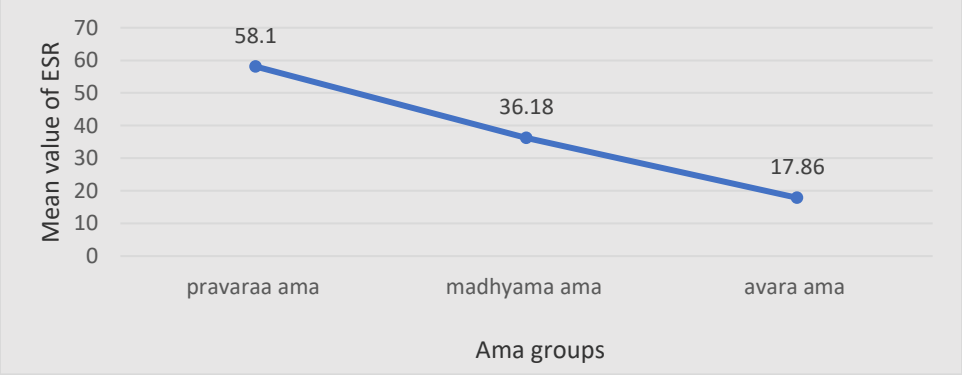
Table 3: Distribution of *Āma lakshana* and ESR status among subjects with different types of *Agni*

Agni status	*Pravara āma*	*Madhyama āma*	*Avara āma*	Raised ESR	Normal ESR
Mandagni	26%	53%	22%	72%	28%
Samagni	7%	23%	70%	45%	55%
Teekshnagni	0	75%	25%	25%	75%
Vishamagni	8%	46%	46%	56%	44%

Table 4: Descriptive statistics of three groups of *Āma* for ESR

	N	Mean	Std. deviation	Std. Error	Lower bound	Upper bound	Minimum	Maximum
Pravara āma	33	58.61	29.024	5.052	48.31	68.90	14	120
Madhyama āma	98	36.18	24.341	2.459	31.30	41.06	8	132
Avara āma	125	17.86	13.569	1.214	15.45	20.26	2	90
Total	256	30.13	24.769	1.548	27.08	33.17	2	132

Chart 1: ESR means in different *Āma* grades



Results

From the descriptive statistics, it is seen that the mean ESR values of *pravara āma* group are 58.61 of *madhyama āma* group is 36.18 and of *avara āma* group is 30.13 respectively. The result of ANOVA analysis shows that there is a statistically significant difference in the mean ESR in each group of *āma (ie, pravara āma, madhyama āma and avara āma)* (ie, p=0.001) as a whole. The Tukey post hoc test (to know which of the groups differed) also revealed that there is a statistically significant difference in the ESR values between three groups, ie. *pravara ama* with *madhyama āma, madhyama āma* with *avara āma* and *avara āma* with *pravara āma.*

DISCUSSION

The mean ESR values in each group of *āma* suggest that ESR which is a biomarker of inflammation changes according to the severity of *āma*. So, the concept of infection and inflammation which forms the basis of modern pathology comes under the broader spectrum *āma* mentioned in the Ayurvedic classics.

The result of ANOVA test indicates that there exists a statistically significant difference among the ESR values of the three groups of *āma* ie., *pravara āma, madhyama āma* and *avara āma* as a whole (F=58.004, p=0.0001). The result of the Tukey post hoc test also showed that a statistically significant difference was obtained in the ESR values between *pravara āma* and *madhyama āma groups*, *madhyama āma* and *avara āma groups* and *avara āma* and *pravara āma groups.*

ESR is an ideal measure of chronic inflammation. In conjunction with physical findings and other laboratory values, ESR can be used to screen for disease or disease complications, aid in disease diagnosis or assess disease activity or response to therapy.

Considering the chronicity of presenting complaints, among subjects with disease chronicity up to 3 years, the majority had either *pravara or madhyama āma lakshana* as well as raised ESR levels. Among subjects with chronicity of 3-5 years, the majority had *avara āma lakshana* as well as normal ESR levels. It can be seen that *āmavastha* shows a declining trend as the chronicity of disease increases. *Acharya Vagbhata* has clearly mentioned the importance of *kaala* in *jwara chikitsa*[15]. In the due course of time, the body itself will activate the cellular machineries for auto-correction and facilitate its reversal into the pre-morbid state. Among subjects with *mandagni*, the majority (72%) had raised ESR and among the subjects with vishamagni, 56% had raised ESR. As already mentioned, the main factor behind *vyadhi* is the deranged status of *agni*. Defective enzymes or metabolic dysfunction lead to the development of an inflammatory state which eventually result in an elevated level of inflammatory markers.

The mean ESR level is highest in *pravara āma* group, moderate in madhyama *āma* and lowest in *avara āma* group. This may be due to the extent of inflammatory pathology (chronic inflammation) in the three groups. ie, higher levels of inflammatory activity in *pravara āma* group, moderate levels of inflammatory activity in *madhyama āma* group and minimal inflammatory activity in *avara āma* group.

Acharya Vagbhata has classified *āmavastha* into *prabhoota āma, madhyama āma* and *alpa āma*. *Langhana* is to be done in *alpa āma, langhana* along with *pachana* in *madhyama āma* and *sodhana* in *prabhoota āma*[16]. So, if there are conditions where *āma lakshana* remain masked or *lakshanas* are not elicitable fully, the physician can plan treatment with the help of laboratory parameters also.

When a physician finds it difficult to reach the diagnosis or to plan the treatment by *āma* assessment only, ESR would be a helpful indicator to choose the appropriate diagnosis or treatment. Considering the ESR values, (in the absence of physiological factors which increase ESR), *sodhana* may be preferred if ESR value is above 58.6mm/hr along with supporting specific lab reports, depending upon the disease. Similarly, *langhana* and *pachana* can be opted if ESR is above 36.2mm/hr. If ESR values are near the borderline, *langhana* can be considered.

CONCLUSION

Āmavastha is a factor that plays a vital role in the occurrence of disease. The raised levels of inflammatory markers during *āmavastha* are a usual finding during Ayurvedic clinical practice. So, this study is carried out to assess the *āma* status in individuals tested for inflammatory markers. A statistically significant difference was obtained between the mean ESR levels of *pravara āma, madhyama āma* and *avara āma* groups. The mean ESR level of *pravara āma* group, *madhyama āma* group and that of *avara āma* group was 58.1mm/hr, 36.18mm/hr and 17.86mm/hr respectively.

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ANNEXURE-1

FORMAT FOR THE ASSESSMENT OF AMA AVASTHA

Domains

1. General symptoms/Samanya Lakshanas
2. Objective signs
3. Appetite/ Agni related
4. Srothas related
5. Bowel/Koshta related
6. Urine/Mootra related
7. Sweat/Sweda related
8. Indriya/sense organs related
9. Psychological/Manasika
10. Upasayanupasaya

GENERAL SYMPTOMS

1. Do you feel tired /fatigued in general?

Frequently – 2 Occasionally – 1 Not felt - 0

2. Do you feel feverish?

Frequently – 2 Occasionally – 1 Not felt - 0

3. Do you feel heaviness to the affected part/ whole body?

Frequently – 2 Occasionally – 1 Not felt - 0

4. Do you feel pain anywhere in the body?

Frequently – 2 Occasionally – 1 Not felt - 0

5. Do you feel to have more yawning?

Frequently – 2 Occasionally – 1 Not felt - 0

6. Do you feel Freshness after awakening in the morning?

Yes – 0 Not felt- 2

7. Is there generalized swelling over the body?

Yes – 0 Not felt- 2

8. Do you feel the tightness of the dress now and then?

Frequently – 2 Occasionally – 1 Not felt - 0

9. Do you feel your complaints increased during the night?

Yes – 0 Not felt- 2

10. Do you feel your complaints increased during cloudy times?

Yes – 0 Not felt- 2

11. Do you feel excessive thirst?

Frequently – 2 Occasionally – 1 Not felt - 0

12. Do you feel excessive sleep?

Frequently – 2 Occasionally – 1 Not felt - 0

13. Do you feel decreased body strength?

Frequently – 2 Occasionally – 1 Not felt - 0

14. Do you feel catching pain over the calf muscle?
Frequently – 2 Occasionally – 1 Not felt - 0
15. Have you noticed restricted body movements?
Frequently – 2 Occasionally – 1 Not felt - 0
16. Do you feel a lack of enthusiasm?
Frequently – 2 Occasionally – 1 Not felt - 0

OBJECTIVE SIGNS
17. Skin looks excessively oily?
Yes – 0 Not felt- 2
18. Face looks just awake] n/sleepy?
Yes – 0 Not felt- 2
19. Do you notice any swelling anywhere on your body?
Yes – 0 Not felt- 2
a. If yes, is it tender?
Yes – 1 No - 0
b. If yes, is there redness?
Yes – 1 No - 0

APPETITE RELATED
20. Do you feel appetite regularly 3 hours after the previous meal?
Not felt – 2 occassionaly-1 Yes - 0
21. If you like to have food now, what type of food do you prefer?
Nothing - 3 Light food – 2 Normal food- 0
22. Recently did you develop a preference for sour and pungent food?
No-0 yes -2
23. Do you feel aversion to food?
Yes – 2 Not felt- 0
24. Do you feel a Nausea/ vomiting tendency?
Yes – 2 Not felt- 0
25. Do you feel excessive salivation?
Yes – 2 Not felt- 0
26. Do you often feel any abdominal discomfort/koshta stabdhada/ gourava without any significant change in regular diet?
Yes – 1 Not felt- 0
a) If yes, what do you feel?
Dullness – 2 Lightness -0)
27. Can you enjoy the taste of the food?
Not felt – 1 Yes - 0
28. Do you feel any specific taste in your mouth?
Yes – 1 Not felt- 0

c. If yes, which taste do you feel?

Bitter – 2 Salt and sweet – 1 Normal – 0

29. What do you feel when you think about your favourite food?

Aversion – 2 Nothing – 1 Desire - 0)

30. What do you feel when you hear about your favourite food?

Aversion – 2 Nothing – 1 Desire - 0)

31. What do you feel when you see your favourite food?

Aversion – 2 Nothing – 1 Desire - 0)

32. What do you feel when you smell your favourite food?

Aversion – 2 Nothing – 1 Desire - 0)

33. During the past week, how would you rate your appetite?

Very poor – 3 Irregular – 2 Good -1 Very good – 0)

34. Do you feel sour eructation?

Yes – 1 Not felt- 0

35. Do you feel a burning sensation of the chest and throat?

Yes – 1 Not felt- 0

36. Do you feel obstruction of the throat by phlegm?

Yes – 1 Not felt- 0

SROTHAS/MALA RELATED

37. Have you noticed excess coating/secretion in your eyes, nose and ears?

Not noticed - 0 Yes – 1

38. Have you noticed excess coating on your tongue?

Not noticed - 0 Yes – 1

BOWEL RELATED

39. How will you rate your bowel?

Constipated – 2 normal – 1 Good - 0

40. Do you have bad belching when you are constipated?

Frequently – 2 Rarely – 1 Not felt - 0

41. Consistency of Stool

sticky – 2 Normal – 0

42. Have you ever noticed that your stool floats in the closet?

Not noticed-0 Stay down – 2 Floats – 0

43. Do you feel flatulent?

Frequently – 2 Rarely – 1 Not felt - 0

44. Do you pass flatus through the anus?

Frequently – 2 Rarely – 1 Not felt - 0

a. If yes, is it foul-smelling?

Yes – 1 Not felt - 0

URINE RELATED

45. How is your urination?

More – 2 Normal – 0

46. Is the urine frothy?

Yes – 1 No – 0

47. Have you noticed any colour change in your urine?

Not noticed - 0 Yes – 1 No – 0

48. Have you noticed any characteristic smell in your urine?

Not noticed - 0 Yes – 1 No – 0

49. Have you noticed turbidity in the urine except for the morning urine sample?

Not noticed - 0 Yes – 1 No – 0

SWEAT RELATED

50. How will you rate your sweating?

Less – 2 Normal – 0

51. Does others remark that your sweat smells bad?

Yes – 1 Not felt- 0

Total score 3

INDRIYA/SENSE ORGANS RELATED

52. Did you notice that your vision getting troubled in recent times?

Yes – 1 Not noticed - 0

53. Did you notice that your hearing getting troubled in recent times?

Yes – 1 Not noticed - 0

54. Did you notice that your sensation of a taste getting troubled in recent times?

Yes – 1 Not noticed - 0

55. Did you notice that your smelling sense getting troubled in recent times?

Yes – 1 Not noticed - 0

PSYCHOLOGICAL

56. Do you feel lazy even for your favourite activities?

Most of the time – 2 Occasionally – 1 Never – 0

57. Do you feel unusually angry against those who console?

Most of the time – 2 Occasionally – 1 Never – 0

UPASAYANUPASAYA

58. Feel good with the warm atmosphere?

Yes – 2 Not felt- 0

59. Feel discomfort with the cold atmosphere?

Yes – 2 Not felt- 0

60. Feel discomfort with the windy atmosphere?

Yes – 2 Not felt- 0

61. Good feeling after Rooksha /Ushna application?
Not Applicable – 0 Yes – 2 Not felt – 0
62. Feel discomfort with Snigda/Seeta applications?
Not Applicable – 0 Yes – 3 Not felt – 0
63. Feel discomfort with Snigda/Seeta food/medicine?
Not Applicable – 0 Yes – 3 Not felt – 0

Source of Support: Nil
Conflict of Interest: None Declared

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