

STATUS OF AGNI IN PANDU ROGA (ANAEMIA) AND ITS ASSOCIATION WITH THE ACIDITY OF GASTRIC SECRETION - A CLINICAL STUDY

R.D.H. Kulatunga¹, N.P Rai², Z. Ali³

¹Senior Lecturer, Department of Kayachikitsa, Institute of Indigenous Medicine, University of Colombo, Rajagiriya, Srilanka

^{2,3}Professor, Banaras Hindu University, Varanasi, Uttar Pradesh, India

Email: krdhkanthi@yahoo.com

ABSTRACT

Agni is a very important and an integral part of the body. It is used for multiple functions which is involved at different levels of digestion, metabolism and assimilation activities in living organisms. Gastric secretion is a digestive fluid formed in the stomach and contain numerous compounds including hydrochloric acid (HCL), pepsin, lipase, mucin, etc. The study has been carried out to assess the status of *Agni* in the patients of *Pandu Roga* and find out its relationship with the acidity of gastric secretion. It was comprised of thirty patients of *Pandu Roga* for evaluation of *Agni* and eleven patients among them were selected for estimation of gastric acidity. The Assessment of *Agni* has been made by adopting subjective and objective parameters. Results of the study revealed that the highest number of patients of *Pandu Roga* (73%) had status of *Mandagni* and Hypochlohydria was found in 72.8% of the patients and they belonged to the hypofunction of *Agni*. Therefore, it can be concluded that patients of *Pandu Roga* have status of *Mandagni* and Hypofunction of *Agni*. In view of the above, it is deduced that *Mandagni* leads to the status of *Pandu Roga*.

Keywords: *Agni*, *PanduRoga*, *Mandagni*, Gastric secretion, acidity

INTRODUCTION

Agni is a very essential factor for the living beings. All the vital activities such as digestion, vision, strength, regulation of the body heat, complexion of the body and longevity of life are mainly dependent on *Agni*^[1]. Therefore, all digestive and metabolic processes come under the action of *Agni*^[2]. In the classics of Ayurveda it has been emphasized that the hypofunction of *Agni* is one of the most important causative factors for almost all the diseases due to the result of weak digestive activity^[3,4]. The *Jataragni* is considered as the master of *Agni* and is claimed to govern the function of all other *Agnis* besides its own function^[5]. Except the normal state of *Jataragni*, there are three pathological states of *Agni*, which are called *Mandagni*, *Vishamagni* and *Theekshanagni*. So, all abnormal states of *Agni* types lead to the production of various diseases in the body^[6].

In modern terms, Gastric acid, also known as Gastric juice, or stomach acid, is a fluid formed in the stomach and is composed of hydrochloric acid (HCL), potassium chloride (KCl) and sodium chloride (NaCl)^[7]. HCL is an important component in gastric juice and the acid plays a key role in digestion of protein by activating digestive enzymes. Moreover, the acidity of gastric juice is one of the crucial factors in the development of most upper gastro intestinal diseases^[8].

In this study an attempt has been made to ascertain the status of *Agni* in the patients of *Pandu Roga* and find out its relationship with acidity content of their gastric secretion. Assessment of *Agni* may help to understand the pathogenesis (*Samprapthi*) of the diseases and also help to develop some conceptual validity for *Jataragni*. Here, more attention has been focused on *Jataragni*.

Materials and Methods:

The study was comprised of 30 clinically diagnosed patients of *Pandu Roga*, registered at the indoor/outdoor patients department of Kaya Chikithsa Ward in the Sunderlal Hospital at B.H.U, Varanasi, India. It included both sexes in the age group of 20-80 years by adopting purposive sampling technique. The research work was a community based descriptive cross sectional study and the acidity of gastric secretion was estimated in eleven patients of *Pandu Roga*.

Selection of the Patients

The following fixed criterion was adopted for the selection of the patients.

1. Complaints of general weaknesses.
2. Pallor of the conjunctiva and nails.
3. Hemoglobin content below 9 gm/dl.
4. The patients who were not having organic defect particularly in the Haemopoetic system.

The selected patients were subjected to laboratory and radiological investigations for clinical diagnosis.

Assessment of Agni:

Three pathological status of *Agni* namely, *Mandagni*, *Vishamagni* and *Theekshanagni* have been assessed by adopting subjective and objective parameters. Subjective parameters were prepared according to the classical descriptions. For this purpose ten questions were developed for each pathological condition of *Agni* in order to assess its status^[9]. First three questions were compulsory for the assessment of the relevant *Agni*. Each question was given one mark (1) if the answer was positive, otherwise "0" mark. If the person who had marks over 50% then he/she was categorized under the same *Agni* group.

In addition, the secretion of free acidity and total acidity of the gastric secretion were estimated as an objective parameter by utilizing fractional test meal examination in the patients of *Pandu Roga*.

Further, Haematological and Biochemical investigations were carried out for the diagnostic purpose and subsequent selection.

Laboratory investigations:

1. Haematological and Bio chemical investigations:

- a) Haemoglobin, Hematocrit, ESR value, Total R.B.C. Count and General Blood Picture.
- b) Serum protein, Fasting Blood Sugar, Blood Urea and Serum Creatinine were estimated.

Beside the above investigations, following test also has been done when required.

- Sputum for AFB.
- X-Ray of the chest.
- Barium meals follow through X-Ray.
- Ultrasound scans in the abdomen.
- Rheumatoid factor and C-reactive protein.
- Gravindex test for Amenorrhea women.

2. Fractional test meal examination:

By this method, total acidity and free acidity of the gastric secretion were estimated in the *Pandu Roga* patients (11 cases). Prior to the fractional test meal examination, the patients were instructed to take light diet in the preceding night and was advised not to take any type of meal or water after 10.00 P.M. Following day in the morning, by inserting the Ryle's tube, they have removed the gastric juice of the patients, and then introduced 20cc of 7% ethyl alcohol to the stomach. Thereafter, every 15 minutes gastric contents have aspirated and four samples were collected. Subsequently, samples were brought for the biochemical examination^[10].

3. Stool examination:

Stool examination has been done macroscopically and microscopically. Microscopically ova, cyst and undigested food and the occult blood were examined.

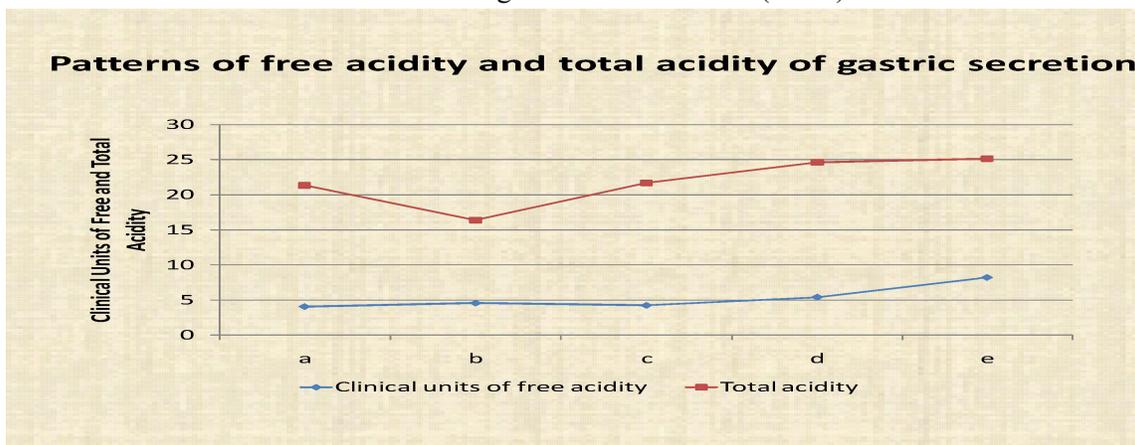
4. Urine examination:

Routine examination was done followed by common macroscopic and microscopic examination.

Observation and Results:

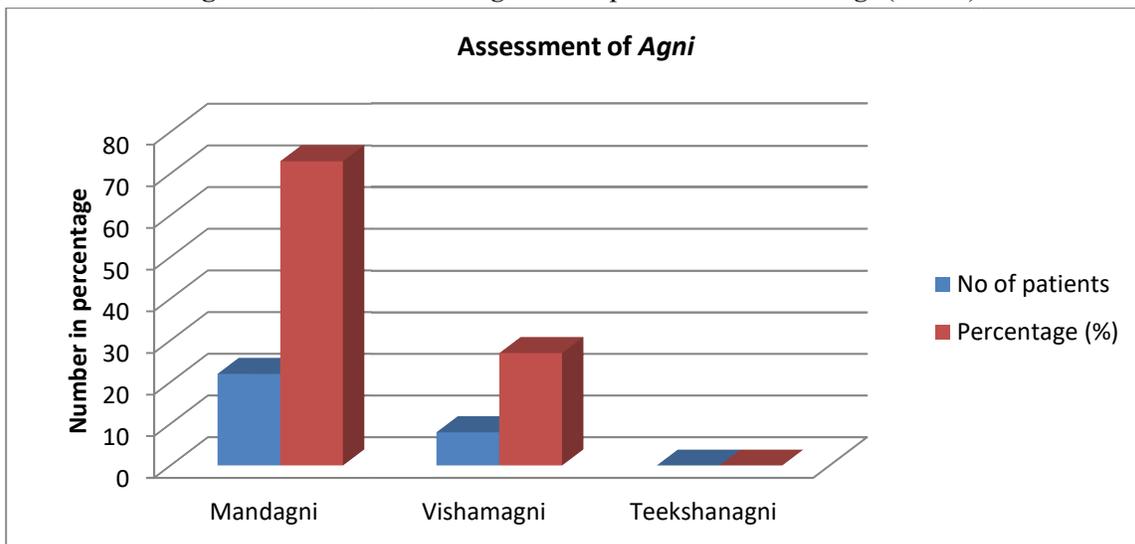
In the demographic profile, majority of the patients were found in age group of 20 -40 years and 66.6% were female, 63.4 % were housewives and 70% were married, 60.0% were vegetarian, 53.4% were illiterate ,63.3% were found from rural area and 53.3% belonged to poor socio economic group.

Figure 1: Patterns of free acidity and total acidity of gastric secretion After introducing 20 cc of 7% alcohol (N=11)



- a- at fasting level
- b- after 15 minutes
- c- after 30 minutes
- d- after 45 minutes
- e- after 1 hour

Figure 2: Assessment of Agni in the patients of Pandu Roga(N= 30)



DISCUSSION

In the clinical profile, all the patients who were having anemia had Hb level below 9 gm/dl [Table-1] and the total count of R.B.C have been reduced [Table-2]. Majority of the patients had general weakness due to *Pandu Roga* (anaemia). It appeared that all the selected individuals did not have any organic defect particularly in haemopoietic system. Various incidences were observed in the patients of *Pandu Roga*. Among them, females suffered more than the males. Normally, anaemia is reported to be more prevalent among females because they are subjected to men-

struation and child bearing. According to the incidence of geographical distribution, majority of the patients have been received from rural areas and their poor hygienic facilities may have contributed to this situation^[11]. Further, maximum number of patients were illiterate. Therefore, epidemic and chronic diseases could be spread easily. Recent research advances revealed that education has important social impact on health conditions of the people and education is strongly linked with health and the determinants of health condition of the people^[12].

Moreover, *Agni* performs the digestion and metabolism of the body. Therefore, the abnormal status of *Agni* produces abnormal digestion and metabolism. In this study, most of the patients had anorexia (100%), reduced level of appetite (100%), indigestion (80%), pain in the abdomen (73.3%), belching after meals (63.3%), heaviness of the abdomen (73.3%), flatulence (70%) (Table-4). It can be suggested that the patients of *Pandu Roga* had malfunctioning of *Jataragni*, and as a result of that production, various immature *Dhatus* will be produced in the body.

Furthermore, valuable inference can be detected by stool examination regarding the status of digestion, absorption and diseases of gastrointestinal tract. In this study, more quantity of undigested food particles had appeared in their stool microscopically and it may be due to inadequate digestion of the food. In Ayurvedic point of view, this scenario could be explained as a result of hypo function of *Jataragni*. Hence, it is identified that the patients of *Pandu Roga* have weak digestive power. In addition; majority of the patients (53.3%) had microcytic hypochromic anaemia morphologically. It means that they were suffering from iron deficiency anaemia. Therefore, it has been proved that both *Pandu Roga* and anemia are a same disease.

Further, incidence of pattern of the serum protein revealed that highest number of patients had reduced serum protein (83.3%) in their blood [Table – 03]. According to Ayurveda, this condition could be attributable to hypofunction of *Agni* of the patients of *Pandu Roga*. Further examination into the reasoning for the reduction of serum protein confirmed that the act of decreasing of the HCL as the root cause of hypo functioning of the *Agni* because HCL plays an important role during the digestive process as described below. This situation highlights the vital role played by HCL in enhancing the level of serum protein.

- Facilitating absorption of iron by converting colloidal iron into ionic form.
- Denaturation of protein of food and thereby making food suitable for digestion.
- Provide the H⁺ ion concentration for pepsin activity.

In view of the above, it has been revealed that the reduction of HCL in gastric juice seriously affects the protein and iron absorption of the body^[13]. In this study it was identified that the level of free acidity (HCL content) in the gastric secretion was very low. After introducing 20 cc of 7% alcohol under the procedures of Fractional test meal, the acid secretion in the stomach has been slightly increased, but not in the significant level [Table-05 & Figure-1]. Similarly, level of total acidity in the gastric secre-

tion were found low in the patients of *Pandu Roga* [Table-6 & Figure-2] and no case was found to have normal gastric secretion. Finally, Hypochlorhydria was seen in 72.8% of the patients of *Pandu Roga* while, Achlorhydria 27.2% and Hyperchlorhydria and Normochlorhydria were not found in these clinical models [Table – 07].

Hence, patients of *Pandu Roga* were having status of hypoacidity in their gastric secretion and it can be explained as a hypo functioning status of *Agni*. As a consequence, it may lead to formation of *Ama* in the body. Ultimately, the vitiation of *Rasa Dhatu* leads to inadequate *Rakta Dhatu* and other *Dhatu* formation of the body and the net results will be the manifestation of *Pandu Roga*. Moreover, subjective parameters of the assessment of *Agni* in the patients of *Pandu Roga* revealed that 73% of the patients had symptoms of *Mandagni*, while 27% had *Vishmagani* [Table-08].

CONCLUSION

The main findings of the empirical analysis can be concluded as follows.

Patients of *Pandu Roga* have status of *Mandagni*. The evidence states that *Mandagni* ultimately leads to the status of *Pandu Roga*. Similarly, patients of *Pandu Roga* had Hypoacidity in their gastric secretion and it was evident that they suffered with anorexia, heaviness of the abdomen, indigestion and pain in the abdomen. Hence, it can be concluded that the patients of *Pandu Roga* suffer from the hypofunction of *Jataragni*.

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Table 1: Pattern of Hemoglobin (Hb%) of the Blood:

Incidence of pattern of Hb % in blood in the patients of *PanduRoga* (anaemia) (N = 30)

Hb value (g/dl)	No.of cases	Percentage (%)
1 – 3	3	10.0
3 – 5	7	23.4
5-7	10	33.3
7 – 9	10	33.3
Total	30	100.0

Table 2: Pattern of total R.B.C. count in the blood

Incidence of pattern of R.B.C count in the blood in the patients of *PanduRoga* (anaemia) (N = 30)

Total R.B.C. count mill/cu mm)	No. of cases	Percentage (%)
1.0 – 2.5	07	23.3
2.5 – 3.5	20	66.7
3.5 – 4.5	03	10.0
Total	30	100.0

Table 3: Serum protein content

Incidence of pattern of Serum protein content in 30 patients of *Pandu Roga* (anaemia)(N = 30).

Serum protein (gm/dl)	No. of cases	Percentage (%)
3 – 4	03	10.0
4 – 6	22	73.3
6 - 8	05	16.7
Total	30	100

Table 4: Signs and Symptoms of *Agni Vikara* (abnormal digestion & metabolism)

Incidence of pattern of signs and symptoms of *AgniVikara* in 30 patients of *Pandu Roga* (anaemia)

Signs and Symptoms of <i>Agni Vikara</i>	No. of cases	Percentage (%)
Reduced of appetite	30	100
Indigestion	24	80
Dyspnoea on exertion	23	76.6
Heaviness of the abdomen	22	73.3
Pain of the abdomen	22	73.3
Flatulence	21	70
Heaviness of the body	19	63.3
Belching after meals	19	63.3
Giddiness	17	56.6
Burning sensation of the abdomen	14	46.6
Nausea	13	43.3

Sweating	10	33.3
Intestinal gurgling	09	30
Fainting attacks	09	30
Thirsty feelings	05	16.6
Sour and hot belching	04	13.3
Feelings of hot fumes coming out	03	10

Table 5: Free acidity

Incidence of pattern of mean values of free acidity (HCl content) at different intervals in Gastric secretion among the patients of *Pandu Roga* (N=11)

Values	Samples				
	Fasting	1 st After15 min.	2 nd After30 min.	3 rd After45 min.	4 th After1 hr.
Mean	4.09	4.59	4.27	5.45	8.27

Table 6: Total acidity

Incidence of pattern of mean values of total acidity at different intervals in Gastric secretion among the patients of *Pandu Roga* (N=11).

Values	Samples				
	Fasting	1 st After15 min.	2 nd After30 min.	3 rd After45 min.	4 th After1 hr.
Mean	21.36	16.4	21.73	24.68	25.18

Table 7: Pattern of Gastric Secretion

Incidence of pattern of Gastric secretion in *Pandu Roga* (Anaemia) Patients(N = 11)

Pattern of Gastric secretion in the Fractional test meal investigation	Present No. of cases	Percentage (%)
Hypochlorhydria	08	72.8
Achlorhydria	03	27.2
Hyperchlorhydria	-	-
Normochlorhydria	-	-
Total	11	100

Table 8: Assessment of *Agni*

Incidence of pattern of status of *Agni* in the patients of *Pandu Roga* (anaemia) (N = 30)

Status of <i>Agni</i>	No. of Cases	Percentage (%)
<i>Mandagni</i>	22	73
<i>Vishamagni</i>	08	27
<i>Teekshanagni</i>	0	0
Total	30	100

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Conflict Of Interest: None Declared

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