

## THE ORIGIN AND DEVELOPMENT OF PULSE EXAMINATION IN MEDIEVAL INDIA

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The pulse examination is one of the practical and handy means to diagnose and prognosticate the disease. It also provides first the opportunity to develop doctor-patient relationship. Pulse examination is described by almost all systems of ancient medicine. The present paper primarily deals with the origin and development of pulse examination in medieval India. Medieval India covers, for this paper, from 800 to 1700 A.D. approximately. This paper will mainly focus pulse examination in Āyurvedic system of medicine and will also examine the influence of Unani system of medicine on this clinical procedure.

In classical literature of Āyurveda, the pulse examination or *nāḍī parikṣā* has been used for prognostic purposes. But the literature starting from Śārṅgadhara and through the centuries deals with pulse examination in much greater details. It is not improbable that the both Unani systems of medicine, which was brought to India by muslim physicians, and tāntrik school of *Yoga* of Indian origin, might have influenced the growth and development of pulse examination in medieval India. But this question requires closer and detailed examination by competent scholars.

### SOURCE MATERIALS

The *Śārṅgadhara Saṃhītā*, *Bhāva Prakāśa*, *Yoga Ratnākara* are the main source materials for this paper.

### ŚARNGADHARA

History does not reveal the clue as regards the determination of the period when Śārṅgadhara flourished exactly. But this much is definite that this period may be considered as the post classical period of Indian medicine, and it corresponds to the Muslim period of India. Sarton believes that Śārṅgadhara flourished

not later than the thirteenth century. In the opinion of Jolly he must have flourished at the latest in the thirteenth century. P. C. Ray dates him in A.D. 1363. However, among controversies prevailing, it seems undesirable at present, to assert the exact period as to when Śārṅgadhara was at the height of fame. The only reasonable conclusion is to assume that he flourished in the terminal phase of thirteenth century. Because Vopadeva, one of the commentators of *Śārṅgadhara Saṃhitā*, was well acquainted with the famous minister Hemadri. And the period of Hemadri, as Jolly has decided, is between A.D. 1260 to A.D. 1309. Śārṅgadhara's contribution to medicine may be aptly described as the reaction of the classical Indian Medicine to internal developments that were slowly taking place between the tenth and the thirteenth century.

#### SARNGADHARA SAMHITA

Śārṅgadhara wrote his work on medicine, known as *Śārṅgadhara Saṃhitā*. The work gained considerable authority and a great popularity, so much so, it found a place as the number two in "light-triad" or *laghu trayī*. In the words of P. C. Ray (1956) "Its popularity is that it is based upon the Āyurvedas (the *Caraka Saṃhitās* etc.) on the one hand and the tāntrik chemical treatises on the other". This work may be considered as the first standard work of iatro chemical reforms in India. Adhamala has written commentary on this work which is considered to be very authentic. In the present context it has been consulted for explanatory notes given on various movements of the pulse<sup>1</sup>.

As regards pulse examination, it has been described in the third chapter of the first part of *Saṃhitā*. Most of the portion of the chapter is comprising of description on pulse examination; and it is for the first time in the history of Āyurveda that *Śārṅgadhara* has included pulse examination in his work as a means of diagnosis.

#### Pulse Examination

Śārṅgadhara's description of pulse examination consists of only in eight verses (*ślokas*). First verse or the beginning, deals with anatomical position of the artery showing its clinical significance as the pulse. Rest of the verses deal with fifteen

<sup>1</sup>Whole of *Saṃhitā* has been divided into three main parts which comprise of thirty-two chapters and 2600 verses. The first part comprising of seven chapters, deals with weights and measures under two separate standards of units—Kaliṅga and Magadha, different times for drug administration, the abnormal spread and normalisation of *doṣas* in the body, qualities of medical stuffs, effects of seasons, anatomy, physiology, merits and demerits of dreams etc. The second part of *Saṃhitā* has been framed by the union of twelve chapters and deals with the pastes (*awaleha*), powders, pills, electuaries (*paka*), medicated ghees, liquors (*asava* and *crīṣṭa*), cold preparations (*him*), various food preparations like *yawagu* etc. The third part is composed of thirteen chapters and deals with practical methodology of *pañcakarma*, medical and surgical aspects of treatment, surgical procedures for blood letting and method of cure like snuffing, smoking, oil gargling, eye fomentation, instillation of eye drops etc.

types of pulses which can be categorised as below: (a) pulse in certain physiological states of the body, (b) pulse in certain mental states, (c) pulse in certain pathological states of the body. The points mentioned above can be read in the following passages.

As regards anatomical position, the artery found at the root of the thumb is evidence of life, and scholars ascertain the healthy state or diseased condition of the body by feeling the movement of it. As regards physiological conditions in a person, who has good hunger and appetite (*dīptāgni*, *kṣudhā*) the pulse is light (*laghwi*) to touch, tremulous (*capala*) and fast; and after the satisfaction of hunger (*tr̥ptāvasthā*), it becomes steady (*sthira*) and in a healthy person the pulse is steady and strong. As regards mental states, in case of lust (*kāma*) and anger (*krodha*) the pulse is rapid; in case of anxiety (*cintā*) and fear (*bhaya*) it is feeble.

As regards pathological states, in the condition of poor appetite (*mcndāgni*) and cachexia (*kṣīnadhātu*), the movement of the pulse is slow. In case of profound intoxication (*āmadoṣa*), it is heavy (*gurvī*) to touch; and when full of blood (*raktapūrṇa*) it is heavy and hard to touch and moderately warm (*koṣṇa*). In case of fever, it is very hot and fat. In case when the one or the other of the three *doṣas* or all of them together are involved, the movements of the pulse in these conditions are correlated with those of the birds, reptiles and amphibians. Thus, in the case when there is excitement of the *vāyu*, pulse resembles to the movements of serpent (*sarpa*) and the leech (*jalauka*), i.e. it assumes the curvilinear motion like them. In the case of excitement of the *pitta*, its movement resembles those of the sparrow (*kuliṅga*), crow (*kāka*) and the frog (*maṇḍuka*), i.e. the pulse becomes leaping; when the *kapha* is excited, the movements of the pulse resemble those of the swan (*hans*) and the pigeon (*pārāwata*), i.e. the pulse moves slowly. In case in which any two of the three *doṣas* are involved the movements of the pulse is alternately slow and fast. In case in which all the three *doṣas* are equally involved (*sannipāta*) the movement of the pulse resemble those of the lark (*lava*), quail (*vurti*) and the partridge (*titter*), i.e. the pulse becomes speedy (*sottalagati*).

When the pulse slips from its normal position (*sthāna vicyuta*) or moves slowly and slowly, indicates death. And also, when it becomes very thin like lotus fibre (*Bisatantuvata* commentary on *Atikṣīṇa*) and cold to touch, indicates death. Various characteristics of pulses described above are given in Table I.

When summarising the discussion of foregoing pages on pulse examination and comparing it with those written in the later period, we find that the description in *Śārṅgadhara Samhitā* is elementary, and it was an important attempt in the direction of introducing the knowledge of pulse examination. In other words it does not seek to diagnose the specific diseases, like *atisāra*, *grahni* etc.

#### BHAVAPRAKASA

Bhāvamiśra, according to Jolly, flourished in the sixteenth century A.D. He

TABLE I

Types of pulse in different conditions	Characteristics of the pulse	Āyurvedic terms	Simile of animals
1. Healthy pulse	Steady and strong	<i>Sthira</i> and <i>Balawati</i>	—
2. Good hunger and appetite	Light to touch, tremulous and fast	<i>Laghwi</i> , <i>Capala</i> and <i>Vegawati</i>	—
3. Satisfaction after hunger	Steady	<i>Sthira</i>	—
4. Lust and hunger	Rapid	<i>Vegavaha</i>	—
5. Anxiety and fear	Feeble	<i>Kṣīna</i>	—
6. Poor appetite and cachexia	Slow	<i>Mandatara</i>	—
7. Intoxication	Heavy	<i>Gurvi</i>	—
8. Full of blood	Full, heavy and tepid to touch	—	—
9. <i>Vātika</i>	Curvilinear	<i>Tiryakagati</i>	Snake and leech
10. <i>Paittika</i>	Jumping	—	Sparrow, crow and frog
11. <i>Kaphaja</i>	Slow	—	Swan, pigeon
12. When any two <i>doṣas</i> are in combination ( <i>Dwandaja</i> )	Alternately slow and fast	—	—
13. <i>Sannipātika</i>	Speedy	—	Lark, quail and partridge
14. Fever	Very hot and fast	—	—
15. Death	Slips from its normal position, slow and thready	—	—

was a famous physician of his time. His work is popularly known as *Bhāvaprakāśa*<sup>2</sup>.

So far as pulse examination is concerned, it has been described in the sixth specified sub-division of the first part under the heading "*Rogiparikṣā*", the examination of the patient. Alongwith the pulse, examination of eyes, tongue and urine have also been mentioned.

### *Pulse Examination*

Bhāvamiśra has condensed his description of pulse examination into twelve verses. Fifteen types of pulses have been described. The whole of the verses

<sup>2</sup>*Bhāvaprakāśa* : One of the authentic works of Āyurvedic literature, occupying a place in 'lighter-traffic' is divided mainly in three parts (*khaṇḍa*), namely : first part (*prathama khaṇḍa*), middle part (*madhya khaṇḍa*) and terminal part (*uttara khaṇḍa*). First part is again divided into two sub-parts (*bhāgas*, first and the second. First sub-part (*byāga*) is composed of six specified sub-divisions (*prakhaṇḍas*). These sub-divisions deal with the origin of medicine, cosmology (*Sṛṣṭi Uttapatti*), anatomy, embryology, pediatrics (*Kaumārabhṛtya*); dietetics, pharmacology etc. Middle part has been further sub-divided into four sub-divisions and deals with the special pathology and the therapy. The terminal part of the book of only eleven pages deals with aphrodisiacs (*Vājīkaraṇa*) and elixirs.

can be read under the following heads : (a) specification of sides for pulse examination in male and female, indication of three fingers to examine it, and unfavourable conditions when it is not examined, (b) relation between the fingers and different positions of *doṣas*, (c) pulse in physiological conditions of the body, (d) pulse in mental states, (e) pulse in pathological states. The points mentioned above are hereby explained below :

The physician should examine the pulse at the root of the thumb in the left hand in case of female and that of right hand in case of male. By applying three fingers over the pulse during examination, the physician can ascertain the case and diseased condition of the patient. The pulse should not be examined, when the patient has taken his bath immediately or is thirsty or has come just from the Sun or is tired due to exercise.

As regards relation between different fingers and the positions of the *doṣas*, *vāta* when vitiated becomes prominent under the index finger, the *pitta* under the middle finger and the *kapha* under the ring finger. When *vāta* and *pitta* are at fault together, the pulse is appreciated in between index and middle finger, while it is felt in between ring and index finger when *vāta* and *kapha* are deranged. In case of vitiation of *pitta* and *kapha* the pulse is felt in between middle and ring fingers. And when all of three are equally involved, the pulse is appreciated under all the three fingers.

As regards the physiological conditions, the pulse of healthy person is steady and strong. In case of appetite it is tremulous and is steady after its satisfaction. As regards mental states, it is rapid in lust and anger; while it is feeble in anxiety and fear.

As regards the pathological conditions, the pulse in fever is very hot and fast. In case of loss of appetite and cachexia it is slow. It assumes curvilinear motion when *vāta* is deranged and is jumping when *pitta* is at fault. In the case when *kapha* deviates from its normal position, it becomes slow; and when all the three *doṣas* are at fault the pulse becomes speedy. When *vāta* and *pitta* are at fault together, its movement becomes curvilinear and jumping. In the case when *vāta* and *kapha* are at fault, its movement becomes curvilinear and slow. The pulse becomes jumping and slow when there is vitiation of *pitta* and *kapha*. When the pulse slips from its normal position and becomes slow and extremely feeble and cold to touch, it indicates death. Various characteristics of pulse are given in Table II .

While summarising the discussion of foregoing pages, we can say that Bhāvamiśra has added new observations after Śārṅgadhara and they are: (1) Bhāvamiśra indicates clearly about the use of three fingers namely, index (*tarjanī*), middle (*madhyamā*) and the ring (*anāmikā*) for pulse examination. These fingers indicate

TABLE II

Types of pulse	Characteristics of the pulse	Ayurvedic terms	Simile
1. In health	Steady and strong	<i>Sthira</i> and <i>balawati</i>	—
2. Appetite	Tremulous	<i>Chapala</i>	—
3. Satisfaction after appetite	Steady	<i>Sthira</i>	—
4. Lust and anger	Fast	<i>Vegavaha</i>	—
5. Anxiety and fear	Feeble	<i>Kṣīṇa</i>	—
6. <i>Vātika</i>	Curvilinear motion	<i>Vakragati</i>	—
7. <i>Paittika</i>	Jumping	<i>Utplutya</i>	—
8. <i>Kaphaja</i>	Slow	<i>Mandagati</i>	—
9. <i>Sannipātika</i>	Speedy	<i>Atidruta</i>	—
10. <i>Vāta paittika</i>	Curvilinear and jumping	—	—
11. <i>Vāta kaphaja</i>	Curvilinear and slow	—	—
12. <i>Pitta kaphaja</i>	Jumping and slow	—	—
13. Fever	Very hot and fast	—	—
14. Poor appetite and cachexia	Slow	—	—
15. Death pulse	Slow, slips from its position, extremely feeble and cold to touch	—	—

the conditions of *vāta*, *pitta* and *kapha* respectively. (2) There is a clear cut indication for specific sites for the examination of pulse in case of female and male. (3) Bhāvamiśra has not correlated various movements of pulse with those of birds, reptiles and amphibians, but has only mentioned the different types of movements such as *vegawati*, *mandagati* etc. experienced directly under the fingers. And thus he has made the subject more objective and practicable. (4) Bhāvamiśra has analysed different characteristics of pulse produced by the combination of any two of the three *doṣas*. (5) He has omitted certain types of pulse as those are full of blood, gastric disorders (*āmadoṣa*) and good appetite (*dīptāgni*). In describing qualitative forms of pulses in the conditions of poor appetite (*mandāgni*), fever (*jwara*), cachexia (*kṣīṇadhātu*), appetite (*kṣudhā*), satisfaction after appetite (*trptāwasthā*), lust (*kāma*), anger (*krodha*), anxiety (*cintā*), fear (*bhaya*) and healthy condition (*swāsthāwasthā*), Bhāvamiśra has practically followed Śārṅgadhara.

#### YOGARATNAKARA

The name of the author of this work is unknown. The period when it was composed, involves various controversies. According to some authors, its period lies between 1650 A.D. and 1725 A.D. According to Jolly this work should have been composed not later than 1746. In the opinion of some other authors, its period is 1676. However, since the work quotes *Nirṇayasindhū* (1611) and *Bhāvaprakāśa* (sixteenth century), it is certain that the work must have been composed after *Bhāvaprakāśa* and *Nirṇayasindhū*. And on the ground of the above date, its period of composition can presumably be placed about in the middle

part of the seventeenth century. Among the existing works related to Āyurvedic medicine, *Yogaratanākara* occupies one of its position<sup>3</sup>.

So far as description about pulse examination as means of diagnosis is concerned, it has been described in the first chapter of the book, under the heading *Rogīparīkṣā* (examination of the patient).

### *Pulse examination*

Description of pulse in *Yogaratanākara* is spread over forty-eight verses. Thirty-three varieties of pulses are of clinical importance, among which fourteen types are completely devoted to describe bad prognosis and death. One type indicates good prognosis. Eighteen varieties deal with the characteristics of pulses in some physiological and other general pathological and general pathological conditions. The whole pulse lore can be considered under the following heads; (a) indication of sites and the method of pulse examination, (b) pulse in physiological conditions and mental states, (c) pulse in pathological conditions, (d) pulse indicating bad prognosis, (e) miscellaneous descriptions related to pulse.

#### (A) *Indication of Sites and Methods of Pulse Examination*

Physician after attaining himself the state of mental stability and peace of soul and mind, should examine by his right hand the pulse below the left thumb in case of female and that below the right thumb in case of male. Particularly in case of females, the physician is advised to examine also the pulse of left leg by applying, the knowledge gained from the classical literature, tradition and self-experience. The pulse below the thumb detects the case and diseased conditions of the patient.

As regards methodology and allied aspects of pulse examination, first the elbow (*kūrpara*) of the patient should be slightly flexed to the left and the wrist slightly bent to the left with the fingers distended and dispersed. In this position the physician should examine the pulse in the first three hours (*aik prahar*) of the morning. Physician after attaining concentration of mind should examine himself the pulse repeatedly for three times by giving and releasing the pressure alternately over it. By this procedure he should decide the condition of *doṣas* in their respective places and the conditions of the pulse whether the pulse is slow, medium or fast; and also whether they are involved singly, or in combination of the two or

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<sup>3</sup>The work can broadly be divided into two major parts namely, the first part (*pūrvārḍha*), and the second part (*uttarakhaṇḍa*). The work deals with four necessary elements (*padcatuṣṭayaya*), as physician, drugs, nursing staff and the patients; different regimens to be followed up in the day, night and seasons. Besides, there is description of drug preparations like liquors, paste, medicated ghees etc. And also there is enumeration of different metals and the process of their classification. There is description also about dietetics. Other means of diagnosis such as stool, urine, eye etc. are also indicated.

all of the three are at fault together. This way the physician may be able to know the good and the bad prognosis of the patient. The pulse should not be examined just after the bath, in hungry or thirsty states or during sleep and just after awakening and the patient has anointed with oil. Repeated practice of pulse examination makes the physician perfect in the art and science of it.

(B) *Pulse in Physiological Conditions and Mental States :*

Good hunger	— Fast and light	— <i>Vegavati</i> and <i>Laghwi</i>
Appetite	— Tremulous	— <i>Capala</i>
Satisfaction after appetite	— Steady	— <i>Sthira</i>
Lust ( <i>kāmu</i> )	— Fast	—
Anger ( <i>krodha</i> )	— Fast	—
Anxiety ( <i>cintā</i> )	— Feeble	— <i>Kṣīṇa</i>
Fear ( <i>bhaya</i> )	— Feeble	— <i>Kṣīṇa</i>

(C) *Pulse in General Pathological States :*

Various characteristics of pulse in these conditions are given in Table III

TABLE III

Types of pulse	Characteristics of pulse	Simile to movement of animals	Relation to fingers
1. <i>Vātika</i>	—	Snake and leech	Index finger
2. <i>Paittika</i>	—	Crow, lark and frog	Middle finger
3. <i>Kaphaja</i>	—	Swan, pigeon and cock	Ring finger
4. <i>Vātapaittika</i>	—	Snake and frog	—
5. <i>Vāta-kaphaja</i>	—	Snake and swan	—
6. <i>Pitta-kaphaja</i>	—	Monkey and Swan	—
7. <i>Sannipātika</i>	—	Moves very fast with intermittent pause, like the acts of woodpecker ( <i>kāṣṭhakutta</i> ) when cutting the wood	—
8. Fever	Very hot and fast	—	—
9. When carrying flesh ( <i>maṅsvaha</i> )	Heavy	—	—
10. Poor appetite and cachexia	Slow	—	—
11. Full of blood ( <i>raktapūrṇa</i> )	Heavy and hot	—	—
12. Autointoxication	Heavy	—	—
13. <i>Vātika</i> fever	Curvilinear and tremulous and cold	—	—
14. <i>Kaphaja</i> fever	Slow, steady, cold and slimy ( <i>picchila</i> )	—	—
15. <i>Kapha-pitta</i> fever	Fast, long and simple	—	—
16. <i>Vāta paittika</i> fever	Curvilinear, a bit tremulous and hard	—	—
17. <i>Vāta-kaphaja</i> fever	Slow	—	—
18. <i>Pittakaphaja</i> fever	Weak, steady and cold	—	—



(D) *Pulse Indicating Bad Prognosis :*

TABLE IV

Periods indicating death	Characteristics of the pulse
1. Death within three hours	Pulse moves like fringe of shawl, coinciding with respiration, and cold.
2. Death within a day	Pulse appears and disappears alternately and moves like drum which is shaped like an hour glass ( <i>damaru</i> ).
3. Death within two days	Pulse carrying excessive amount of metabolites and cold to touch indicates death within two days.
4. Death within three days	Pulse not felt at the proximal end, cold in the middle and appears tired at the terminal part.
5. Death within seven days	Pulse becomes speedy at the proximal end, sometimes cold and sweaty and slimy skin, indicates death within seven days.
6. Death within fifteen days	Pulse is hot, fast and the body is cold and patient takes mouth breath.
7. Patient nearly dead	Pulse extremely weak, runs very fast and cold.
8. Sudden death	Pulse adopts curvilinear motion like that of lightning and alternately appears and disappears. Pulse with intermittent pause indicates bad prognosis. Slow, tremulous with intermittent pause, weak, visible sometimes in the finger, indicates death. It is a <i>sannipātika</i> pulse. Pulse first <i>vātika</i> , then <i>paittika</i> and then <i>kaphoja</i> , and assumes the circular movement and horrible, weak and disappears from its place, indicates bad prognosis. Pulse excessively tremulous, too much jumping appearing beneath the fingers indicates bad prognosis. The pulse which is amalgum of the three <i>doṣas</i> , indicates bad prognosis. Pulse, moves zig-zag ( <i>tiryaka</i> ) and also like snake, hot and fast and the throat of the patient is full of cough, indicates death.
9. Pulse indicating good prognosis	The pulse moves like swan and elephant and the patient is happy. If the pulse beats 30 times in its place in one <i>man</i> the patient shall survive otherwise not.

(E) *Miscellaneous Descriptions Related to Pulse*

In hyperbolic language just to give emphasis on the importance of the pulse examination, it has been cited that as the instrument made of by the union of fine wires (*sitar*) emits the various melodic tunes when it is struck, similarly the pulse of the hand is sufficiently able to tell the various diseases of the body. Therefore, the pulse should be examined by the physician to know the condition of deranged *doṣas* in the beginning and at the end. And the physician is also advised to examine the pulse first, and subsequently eyes, tongue and urine, and then treat the diseases accordingly. The physician who does not follow this rule, kills the patient and gains bad reputation. In pulse, specific places for gods have been allotted, as

*vāta* for Brahma, *pitta* for Śaṅkara and *kapha* for Viṣṇu. Different synonyms of *nāḍī* have also been enumerated in the work, e.g. *dhamanī*, *tantuki*, *jīvitajña*, *dhāra*, *hīmsru*, *snāyu*.

Thus in describing pulse examination, Yogaratnākara enumerates certain more points of importance than its previous works as *Śārṅgadhara Saṃhitā* and *Bhāvaprakāśa*. First, there is indication that besides examining left hand in case of female, stress has also been given to examine the pulse of the left leg in this case. Secondly, he has clearly mentioned the importance of mental peace to reach at the diagnosis accurately by examining the pulse. Thirdly, there is mentioning of detailed anatomical position of the forearm including wrist during pulse examination. Fourth, there is indication of the fixed time when pulse should only be examined. Fifth, there is description of quantitative form of the pulse as thirty times. Sixth, there is indication to examine the pulse repeatedly for three times in the same period. Seventh, the work advocates for the practice of pulse examination as much as it can be, to get the mastery over the science. Eighth, there is clear cut indication of acquiring the knowledge by self-experience. This is indicative of that the knowledge of pulse examination can only be achieved by constant practice and applying one's own thinking. Ninth, there is enumeration of greater number of pulses indicating bad prognosis and death. Of course, the work does not mention about the pulse of a healthy person. In the end, there is instruction to the physician to wash his hand after examining the patient.

#### *Avicenna's Contribution to Pulse Examination*

The description of pulse lore in Arabian medicine is qualitative and an asset of details regarding different signs and symptoms have been furnished. Chief points to be elicited during the examination of the pulse are: (1) length, (2) breadth, (3) height, (4) the needs of the body, (5) hard, (6) soft, (7) irregular, (8) strength. Some among the types of the pulses described by Arabian medicine are: (1) gazelle pulse, (2) vermicular pulse, (3) ant-like pulse, (4) serratic pulse, (5) decurtate pulse, (6) spindle-shaped pulse (7) dicrotic pulse, (8) supernumerary pulse, (9) cord-like pulse. In addition to these, Arabian medicine has observed differences in the pulse with age and sex, temperament, seasons, place (countries), food and drinks, alcohol etc. A significant observation made by Avicenna who has quoted Galen about the difference between the effects of alcohol and pomegranate juice is that, "the pomegranate juice is a tonic for those with hot-temperament, while honey-water benefits those with cold temperaments. Similarly, alcohol is beneficial for people and injurious to others according to its hot and cold quality". On the character of the pulse exercise, baths, pregnancy, pain, swellings, inflammations, and the factors enimical to the body have also been described.

The description of main features of the pulse which Avicenna (10 A.D.) has described are of outstanding importance. He has mentioned in his book *Canon of medicine* that "the physicians have laid down ten features for examining the

pulse although these should have been nine only. In this way the pulse varies in respect of :

(1) Size, i.e. in the degree of expansion as estimated by its height, length, and breadth. The pulse has thus nine simple and a large number of compound varieties. The nine simple varieties of the pulse are the long, short, and medium; the broad, narrow and medium. The various compound varieties of pulse are worked out from combinations of the simple varieties. Some of these varieties have special names, others have none. Thus, a pulse which is large in length, breadth, and height is called a pulse of large volume and the one which is small, in these dimensions, is called the pulse of small volume. The average pulse between these two is known as the pulse of medium volume. Similarly, a pulse which is large in breadth and height is known as a bounding pulse and that which is small in this respect is called a thin pulse. A pulse which is average between these two extremes is a medium pulse.

(2) Strength of the pulse beat as felt by the fingers. The strength of the pulse may be strong, feeble and medium.

(3) Velocity of the pulse beat, i.e. speed. The velocity of the pulse beat may be quick, sluggish or medium.

(4) Quality of the vessel wall. This may be soft, hard or medium.

(5) Fullness or emptiness of the artery. The pulse may be full, collapsing or medium.

(6) Temperature. The pulse may be hot, cold or moderate in temperature.

(7) Rate, i.e. frequency. The pulse may be rapid, slow or medium.

(8) Consistency or inconsistency regarding the various features.

(9) Regularity and

(10) Rhythm. Rhythms of the pulse is time relation between two periods of movements and the two periods of rest. The pulse may thus be errhythmic or dysrhythmic. Disrhythmic pulse is of three varieties; (a) pararrhythmic in which the rhythm of a child's pulse is like that of the pulse of a young man; (b) heterorhythmic in which the rhythm of a child's pulse corresponds to that of an old man's pulse or (c) erythmic in which the rhythm is so utterly abnormal that it does not correspond to the rhythms of any age. Marked deviations of rhythms indicate gross derangement in the body.

For usual practice, regarding site of examination of the pulse Avicenna has mentioned that pulse is felt by palpating the (radial) artery at the wrist. He has given three possible reasons for artery to be chosen for the examination of the pulse. Firstly, it is more accessible. Secondly, it can be examined without embarrassment to the patient, and thirdly, it is in direct continuation of the heart

and quite close to it. Regarding the method of examination he has said that the forearm should be kept in the mid prone position because in thin and weak persons pronation increases the height and width of the pulse, but decreases the length, while supination increases the height and length but decreases the width.

#### CONCLUSION

It is also important that the pulse should be felt when the subject is neither angry, nor excessively happy or under stress of exercise and emotions. His stomach should be neither overloaded nor altogether empty. He should also not be out of breath. The subject should neither have given up any of his long standing habits nor should have adopted new ones.

In order to make a proper assessment of the various changes it is important that the pulse should be compared with that of a temperamentally well balanced person.

Thus, it can be seen that the pulse examination of Āyurvedic system in medieval India was developed by the Āyurveda itself, but it might have been influenced to some extent by Unani system of medicine also.

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