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DRUG EVALUATION – AYURVEDIC PERSPECTIVE W.S.R. TO *VIRYA*

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ABSTRACT

Ayurvedic perspective of drug evaluation means finding out 'Ayurvedic Biodata' or '*Rasapanchaka'* of a drug, with which the pharmacological action of a drug can be predicted. This is needed because of two important concerns – first, most of our *nighantus* have difference of opinion about the *rasa*, *guna*, *virya* and *vipaka* of several drugs and this has resulted in controversies. Second major problem in front of us is nothing but drug crisis and subsequent issues. For this, new drugs have to be incorporated to Ayurvedic Materia Medica and exploring the 'ayurvedic biology' is essential to predict their pharmacological action of which *virya* is the most important one.As such, thousands of researches are being conducted on herbs, but, only very less attention is being paid to the validation of drug action on the basis of ayurvedic principles. As it is known, Ayurveda is a holistic science and so making objectivity for the basic concepts like *virya* requires continuous interface between Ayurveda and conventional medicine. At present there are no fixed and well accepted criteria to assess the *virya* of a drug. This paper is an endeavor to propose some methods which can be tried to fix an objectivity for the *virya* of a drug, on the basis of principles of Ayurveda with the aid of modern parameters.

Keywords: *Virya*,*Usna*,*Sita*,Evluation methods, Objectivity

INTRODUCTION: Though, those who are in the field of Ayurveda, have great proud and faith in this science, globally it is considered as one of the 'Traditional Medicine' (TM), second to Traditional Chinese Medicine. And in countries where the dominant health care system is Allopathic Medicine, or where TM has not been incorporated into the National Health care system, it is often considered as 'complementary', 'alternative' or 'non conventional medicine [1].

According to WHO Strategy for Traditional Medicine, the challenges in developing TM / CAM potential are a number of issues, which relate mainly to lack of Research Methodology and inadequate support for research [2].

Eminent personalities in the field of Ayurveda opine that research is the prime need of contemporary Ayuveda; it requires two pronged research enterprises - namely Research in the science of Ayurveda and Research in the therapeutics of Ayurveda. And till now, the entire effort is seems to have been focused on therapeutic research and the research in the Science of Ayurveda has remained largely unexplored [3].

Virya:When considering the Science of Ayurveda, the major one among the basic concepts is *'virya'* (potency). *'Virya'* is the most potent factor behind the pharmacological action of a drug [4]. It is the property inherent in a drug by which it functions is known as *virya*, and without *virya*, the drug cannot function.

So Validation and Re-validation of *virya* is the need of the hour.

***Virya* -Validation**

The burning problem in front of Ayurvedic field nowadays is nothing but Drug crisis. The scarcity of drugs has led to issues like - adulteration, substitution and even extinction of certain species of medicinal plants. One remedy to meet this situation is 'introduction of new drugs to the Materia Medica of Ayurveda'. To make a botanically known drug as part and parcel of Ayurveda, the 'Ayurvedic principles of drug action' i.e., *'Rasa panchaka'* of which *virya* is the most important one.

Virya - Revalidation

There is well description about drugs in our ancient lexicons i.e., Nighantus .But even these Nighantus themselves are controversial about the properties of many drugs. The same drug is attributed different properties in different texts. For example *'Sirisha'* is said to possess *Sita virya* by both *Raja nighantu* and *Madana pala nighantu, Usna* virya by *Dhanwantari nighantu, Anushna sita virya* by and *Kaiyadeva nighantu* and *Bhava prakasa nighantu.* So it is of utmost importance to rule out the controversy and to fix the *virya* of a drug.

Fixing an Objectivity

As we know, Ayurveda is a Holistic Science, on the contrary, the essence of Conventional Science is Reductionism. To make an appropriate Research method or protocol, continuous interface between Ayurveda and Conventional Medicine is needed. Here, a limited degree of reductionism can be permitted in order to enable the Modern Science to probe the high degree of system complexity of Ayurveda.

Till now, there are no fixed and well accepted criteria to assess the *virya* of a drug. This paper attempts to propose some methods which can be tried to assess the *virya* of a drug, on the basis of principles of Ayurveda with the aid of modern objective parameters. For this purpose, a brief description about the concept of *virya* as told in classics is mentioned.

Virya in Literature

Etymology of *virya*

The term *virya* is derived from the Sanskrit root *vir* meaning that *vikrante* that which is 'powerful' or 'potent'.

Charecteristic of *virya*

Acarya Caraka has precisely quoted *virya* as the factor behind the pharmacological action of a drug[5]..

Causes of *Virya* perception (*Virya Upalabhdhi*)

Acarya Caraka quotes that *virya* is obtained in two ways i.e.,During their association with the body *(adhivasa)* or Immediately after their contact with the body (*nipata*) [6].

Classification of *virya*

There are mainly three classifications available in the classics in relation to *virya* . They are *Dravya virya vada,Guna virya vada* and *Karma virya vada* . Among these, *Guna* virya *vada* is the widely accepted one. In that itself, two opinions are there.*Dwividha virya vada* and *Astavidha virya vada*.

Astavidha virya vada

According to this, the *guna* (quality) – *guru* (heaviness), *laghu* (lightness), *sita* (coldness), *usna* (hotness), *snigdha* (unctuousness), *ruksha* (dryness), *mridu* (softness), *tiksna* (sharpness) - are proposed as eight *virya* (potency). *Acarya Susruta considers* the *guna visada* (clearness) and *pichila* (sliminess) in place of *guru* (heaviness), *laghu* (lightness) [7].

Dwividha virya vada

This view is strongly supported by *Acarya Susruta* and *Vagbhata* [8].i.e., the qualities such as *guru, laghu* etc and the seasons such as *Sissira, Vasanta* etc. are predominated by only two elements - *Agni* and

Soma. So *virya* is also only of two kinds- *Usna* and *Sita*. Even though the substances are having many qualities in them, *Usna* and *Sita are* more potent than all others and the rest are within the scope of these two only.From this it is clear that virya is nothing but potent *guna*.

Action of *Guna*

While describing about *Guna samanya*, *Acarya Vagbhata* says that the *sareera dhatu* get nourished with those *aahara* and *vihaara* which has similar guna of it.Thus it can be seen that *guna* are having direct action on *dhatu* [9].

Action of *Virya*

Since *guna* are having action on *dhatu*, *virya* will definitely have action on the same, for they are the potent *guna*.

Assessment of *Virya*

Virya has to be assessed from the site where it acts. From the facts which are mentioned earlier, we can come into a conclusion that *virya* has to be assessed at the *'dhatu'* level which can be taken as tissues or cells and they are the sites of 'metabolism' or 'biotransformation'.So the tool to assess *virya* can be that on 'metabolism', or 'metabolic rate' or rather 'Basal Metabolic Rate'.

Basal Metabolic Rate (BMR)

Basal Metabolic Rate or BMR is the minimum energy production needed for the maintenance of cellular metabolism when the body is in the basal condition [10].Or otherwise, it can be defined as the certain minimum amount of energy needed for the maintenance of life, even during the period of rest and sleep.

BMR is usually measured in terms of the amount of oxygen consumed. According to the composition of BMR and membrane pacemaker theory of metabolism proposed by Rolfe and Brown (1997), 10%of the Oxygen consumed during basal metabolism is utilized by non-mitochondrial processes,20% of the consumed Oxygen is used by mitochondria to counteract the mitochondrial proton leak and the remaining major 70% is used for mitochondrial ATP production.'

So it can be concluded that when ATP production is increased, BMR is also increased.

How *Virya* affect BMR

Usna virya karmas as mentioned in various classical texts are given below in the table.

Table No:1 *Usna virya karma*

Ashtanga Samgraha.	*Dahana, Pachana , Swedana, Vilayana , Anilakapha samana*[11]
Ashtanga Hridaya	*Bhrama, Trit, Glani, Sweda , Daha , Aasupakita* [12]
Susrutam Sutram	*Dahana ,Pachana, Moorchana , Swedana , Vamana ,Virechana* [13]
Dravya Guna Samgraha	*Kapha vataharam, pitakaram, laghu, avrushyam* [14]

On analyzing these *karma*, it is clear that all of them are 'breaking down' processes or 'catabolic reactions'.On the contrary *Sita virya karma, as* it's seen below are 'building up' processes or 'anabolic reactions

Table No:2 *Sita virya karma*

Ashtanga Samgraha.	*Hladana, Sthambhana, Jeevana, Rakta pitha Prasadanam*[15]

Ashtanga Hridaya	*Hladana, Sthambhana, Jeevana, Rakta pitha Prasadanam*[15]
Susrutam Sutram	*Prahladana, Vishyandana, Sthireekarana, Prasadana , Kledana , Jeevana*[17]
Dravya Guna Samgraha	*Guru , Balyam*[18]

The biochemistry behind cellular metabolism reveals that, every catabolic reaction is exergonic reactions and they yield ATP and every anabolic reaction are endergonic reactions and they consume ATP. The diagrammatic representation is given [19]

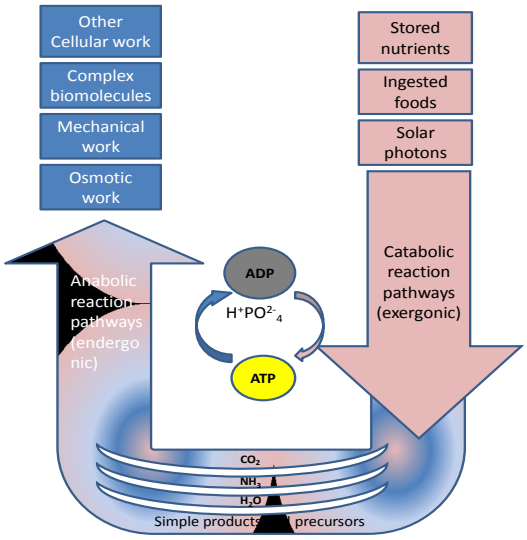

Diagram No: 1 cellular metabolism

As it is already seen, when ATP production increases, BMR also increases; or otherwise, when the Basal Metabolic Rate increases, ATP production also increases.

So it can be concluded that the *Usna virya* will increase BMR, on the other hand *Sita* virya will decrease BMR. It can be tabulated as follows

Table .3

Usna virya	***Sita virya***
Catabolic reaction	Anabolic reaction
Exergonic reaction	Endergonic reaction
Yield ATP	Consume ATP
BMR increases	BMR decreases

From these, the objective parameter to assess *virya* can be fixed as BMR.

The next question is how an experimental method can be formulated to assess *virya* .

Experimental Method - General

BMR can be assessed in many ways, but the easiest and feasible method is measuring the amount of Oxygen consumed, with a Respirometer[20].

In normal condition, body will try to maintain its homeostasis, whatever drug may administered. Only in challenged

conditions may it be a disease or stress, the action of a drug become significant.

So, here we have to go for a model in which BMR is challenged. One of the apt model for a challenged BMR can be that on 'Thyroidism'. As it is known, in Hypothyroidism BMR is decreased and in Hyperthyroidism BMR is increased [21].

Hence to find out the *virya* of a particular drug, first induce Hypothyroidism in experimental animals and administer the drug as per the standard procedure. If there is a significant increase in BMR, it can be assumed that, the drug is having *Usna virya* .If there is no significant change in BMR, the same drug can be tried in Hyperthyroidism induced model, where BMR is increased. If the drug is having the capacity to decrease the BMR significantly, *sita virya* can be attributed to that drug.Suppose, in both these conditions, if there is no significant change at all, that drug can be declared to have '*anusnasita virya'* (neither hot or cold potency).This method can be taken as a general one to fix the *virya* of a drug.

Limitations and Recommendations:The methods proposed here are hypothetical and it has to be tried first in known drugs with known properties, to check the credibility of the same. How this frame will be suitable for a *vichitrapratyayarabdha dravya* is still a matter of concern and it also has to be resolved by experimenting with known *vichitrapratyayarabdha dravyas.*

-There is no surety about the aptness of criteria which were put forwarded here

-There are many setbacks for animal models. All these are only some glimpses of the *viryakarmas* and their interpretations. Likewise we can elaborately think about more *karmas*, more body systems and most apt experimental methods.

-The purpose of research should not be compromised with the available experimental methods, but new suitable method has to be formulated.Clinical trials must be the last and final word for all these experimental studies.

CONCLUSION: *Virya* is the most important factor behind the pharmacological action of a drug. The assessment of *virya* is the need of the hour, for new drugs have to be incorporated into Ayurvedic materia medica to meet the increasing demand of drugs and to substitute the extinct ones. Also clarity is required regarding the *virya* of several drugs mentioned in various *nighantus.*In this era of research, objectivity for *virya* also has to be found out with the aid of modern parameters, while taking care not to hamper our basic concepts. One of the better options for this is to fix objectivity with experimental animal models and it can be compared and correlated with clinical observation also.

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