



## REVIEW ARTICLE

### IDEAL BLOOD DONATION: AN AYURVEDIC PROSPECTIVE (PRE AND POST DIETETIC MANAGEMENT)

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#### ABSTRACT

Besides testing blood groups, HIV, Hepatitis B and C, syphilis and other infections certain other factors should also be considered before blood donation. Laws of Ayurveda can be implicated for collecting and providing quality blood to the recipient and assuring good health of donors so that multiple episodes of blood donation can be done to cope increasing needs of blood. Pre and post blood donation activities including diet and disciplinary habits to be followed are discussed. Ayu (age), sex, Matra (quantity) of blood for donation, Kala (time/number of donation a year), ideal donor-Raktasara Purusha (individual having excellence of blood), indications to blood collector etc. are discussed according to Ayurvedic view. Blood-letting in Ayurveda is followed by depletion of Dhatus (tissues) which further leads to a depression of the Agni (digestive power) and excessive aggravation of Vayu. Donor's dietary habits including food items viz. vegetables, non-vegetarian items, other consumables items, in disciplinary habits, mental condition, disease, symptoms and complaints of donors are considered before ideal blood donation. Pre dietetic management includes having Yavagu (gruel) and post dietetic management including Manda (rice water) is recommended. Post disciplinary management for blood donor is also discussed. Diet recommendation for regular blood donors is given.

**Keywords:** blood donation, pre-post diet, Ayurveda, Yavagu, Manda.

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## INTRODUCTION:

Every year India requires about 5 crore units of blood, out of which only a meager 2.5 crore units of blood are available. One unit is 450 ml of blood, which is roughly one pint. Every two seconds someone needs blood. There is no substitute for human blood. Blood cannot be manufactured; it can only come from generous donors. The average adult has about 10 units of blood in his body. Roughly 1 unit is given during a donation. A healthy donor may donate red blood cells every 56 days, or double red cells every 112 days. A healthy donor may donate platelets as few as 7 days apart, but a maximum of 24 times a year<sup>[1]</sup>. So, to maintain the health of donor one must be very precise for what to have before and after blood donation. The chapter on "blood formation (haemopoiesis) and the regimen therefor" named "Vidhishonitiyadhayaya" explains the answer.

In Ayurveda, not a drop of blood leak is supposed to be normal. Rakta (blood) has been considered to be the essential tissue of the body. Blood is the mainstay of body; the body totally depends upon it. Hence, every attempt must be made to preserve it; in other words, blood is equivalent to life itself<sup>[2]</sup>. However, the concept of bloodletting is studied in a healthy and diseased person. An ideal blood donation is studied. Blood-letting in Ayurveda is followed by depletion of *Dhatu*s

(tissues) which further leads to a depression of the *Agni* (digestive power) and excessive aggravation of *Vayu*. *Agni* needs to be corrected and vitiated *Vata* should be pacified accordingly. Ayurveda further emphasizes on blood formation in *Yakrita* (liver) and *Pliha* (spleen). Diet and drugs acting on these two organs potentiate blood formation.

An ideal blood donation should be performed each time. This would assure quality blood and its components for recipient. Diet/ disciplinary habits before and after blood donation assure good health status of donor and hence multiple donation episodes with a donor are done to cope increasing needs of blood donation.

### Need of the study:

1. To collect quality blood and its components for recipient by improving dietary and disciplinary habits of donor.
2. To assure good health status of donor by educating him benefits of blood donation and post dietetic management.
3. To assure multiple blood donation episodes in an individual to cope emerging needs.

### MATERIALS AND METHODS:

1. Study is literary review based on material available in Ayurvedic and modern texts including journals, websites etc.
2. Ayurvedic methodology is applied to study factors for ideal blood donation, pre and post dietetic regimens.

## AIMS AND OBJECTIVES:

1. To study the concept of ideal blood donation as per Ayurvedic laws.
2. To study the pre and post diet, other factors for blood donation as per Ayurveda.

Conceptual study and observations:

According to ayurveda ideal blood donation should be four-step process:

Step 1: Assessment and registration of an ideal donor.

Step 2: Pre dietetic and disciplinary management.

Step 3: Blood donation (Indications at the time of blood collection (including medical history and mini-physical check-up)

Step 4: Post dietetic and disciplinary management.

### Step-1: (Assessment and registration of an ideal donor)

Following are the persons not considered suitable/ ideal for blood donation. Donor's dietary habits including food items viz. vegetables, non veg. items, other consumables items, in disciplinary habits, mental condition, disease, symptoms and complaints of donors should also be considered before blood donation.

#### a) Person with following dietary habits is not suitable for blood donation<sup>[3]</sup>:

1. Person who is in a habit of taking or has taken *Ati-Lavana-Kshara-Amla-Katu* (excessively saline, alkaline, acidic and pungent foodsviz.

carbonated drinks, bakery products, pickles, salty snacks, pizza, cake, burgers, fast foods) or unwholesome or food in large quantity or wine with *Tikshana* (sharp) and *Ushna* (hot) property is not considered ideal for blood donation.

2. Pulse and vegetables like *Kullatha* (*Dolichosbiflorus* Linn.), *Masha* (*Phaseolus radiates* Linn.), *Nishpava* (a type of vegetable), *Tila* oil (sesame oil), *Pindalu* (*Dioscoreaalata* Linn.), all tubers and raw green vegetables like radish etc. Non-veg. items like meat of aquatic and animals of marshy areas or animals living in wholes should be avoided.
3. Other items like Curd, *AmlaMastu* (sour whey), *Shukta* (vinegar), *Sura* (wine) and *Sauviraka* (type of liquor) should not be consumed before blood donation.
4. Rotten, putrefied food articles and *VirudhaAhara* (foods having mutually contradictory qualities) and any other type of foods in excessive quantity should be avoided before blood donation.

#### b) Person with following in disciplinary habits/ mental condition is not suitable for blood donation<sup>[3]</sup>:

1. Person who is in a habit of sleeping during day time after taking liquid, unctuous and heavy food and taking food before the previous meal is digested.
2. Person who has excessive anger and is usually/ at the time before blood donation has

- excessive exposure to the sun or fire and who is in a habit of suppressing the urge for vomiting, urine and feces.
3. Blood donation should not be performed on a person who has exertion, external injury and heatstroke.
  4. Person who had not taken bloodletting therapy in *Sharad Ritu* (in autumn) as prevention to avoid *RaktajVikara* (blood disorders) is not considered ideal for blood donation.
  5. *SharadRitu*(autumn season, September-October) itself is not considered suitable for blood donation.
  6. Person who is emaciated, indulges in too much sex, is impotent, frightful, pregnant women, women in parturition and after *Shodhana* therapy (five purification therapies) should not be allowed to donate blood.
  7. However, avoid smoking at least a day before blood donation and avoid drinking at least 48 hours before blood donation.
- c) Person with following list of disease/ symptom/ complaint should not be considered for blood donation<sup>[3]</sup>:**

**Table No. 01- Unfit persons and conditions for blood donation**

S.No.	Disease/ Symptom/ Complaint	S.No	Disease/ Symptom/ Complaint
1.	<i>Mukhapaka</i> (stomatitis)	17.	<i>Santapa</i> (burning sensation)
2.	<i>Akshiraga</i> (redness in eyes/ conjunctivitis)	18.	<i>Atidaurbalya</i> (excessive weakness)
3.	<i>Putigharanasyagandhita</i> (rhinitis, foul odour from mouth)	19.	<i>Aruchi</i> (Anorexia)
4.	<i>Gulma</i> (abdominal tumor)	20.	<i>Shirsarukka</i> (headache)
5.	<i>Upkusha</i> (type of mouth diseases)	21.	<i>VidahaAnnapanasyaTiktaAmlaUdgara</i> (bitter sour eructation after diet and drink not digested properly)
6.	<i>Visarpa</i> (erysipelas)	22.	<i>Krodha</i> (excessive anger)
7.	<i>Raktapitta</i> (bleeding from different parts of body)	23.	<i>Lavanasyata</i> (saline taste in mouth)
8.	<i>Pramilaka</i> (person with habit of	24.	<i>SwedaShariraDaurgandhya</i> (excessive sweating,

	Thinking every second/ drowsiness)		foul smell of the body)
9.	<i>Vidradhi</i> (abscess)	25.	<i>Mada</i> (any intoxication)
10.	<i>Raktameha</i> (hematuria)	26.	<i>Kampa</i> (shivering)
11.	<i>Pradara</i> (menorrhagia)	27.	<i>Swarakshaya</i> (aphonia)
12.	<i>Vatashonita</i> (gout)	28.	<i>TandranidraAtiyoga</i> (drowsy, excessive sleep)
13.	<i>Vaivarnya</i> (pallor)	29.	<i>Tamashchatidarshanam</i> (frequent attack for fainting)
14.	<i>Agnisada</i> (suppressed power of digestion)	30.	<i>Chardi</i> (vomiting)
15.	<i>Pippasa</i> (thirst)	31.	<i>Atisara</i> (diarrhea)
16.	<i>Gurugatrata</i> (heaviness in body)	32.	<i>Kandukothapidikakushthacharmadalaadi</i> (pruritis, eruption, urticaria, pimples, obstinate skin diseases including leprosy, dermatitis etc.)

**Ideal Donor- *Raktasara Purusha*:** An ideal donor must possess the properties of *Raktasara Purusha* (individual having excellence of blood). Individuals having the excellence of *Rakta* or blood are characterized by *Snigdha* (unctuousness), *Raktavarna*(red color), beautiful dazzling appearance of the ears, eyes, face, tongue, nose, lips, sole of the hands and feet, nails, forehead and genital organs. Such individuals are endowed with *Sukha* (happiness), *Medha* (great genius), *Manasvi* (enthusiasm), *Sukumaryata*(tenderness), *Anatibala* (moderate strength) and *Akleshasaha* (inability to face difficulties). Their body remains hot<sup>[4]</sup>.

However, quantity of blood donated should be as per donor's strength and nature<sup>[5]</sup>. Donors can be examined with reference to *Sara* (the excellence of their *Dhatus*/ tissues).

Considering the above factors, ideal donors should be identified and registered.

## **Step 2: Pre dietetic and disciplinary management:**

### **Dietetic management before blood donation:**

#### ***Yavagu*: (*Panchkola Siddha Yavagu*) :**

#### **Quality of *Yavagu*:**

*Kashyapa Samhita* has described the standard quality of *Yavagu*<sup>[6]</sup>. A quality *Yavagu* should possess normal semisolid texture and should not be excessively concentrated or

dilute. It should be prescribed in warm and fresh condition and not after cooling. The rice grains should remain intact after the

preparation as it can be separated from each other and the ultimate quality is its pleasant and palatable appearance.

**Table No. 02: Contents and proportion of *Panchkola Siddha Yavagu*:**

S.N	Name of the ingredients	Botanical name	Rasa	Guna	Veerya	Vipaka	Doshkarma	Quantity
1.	Rice (paddy)	<i>Oryza sativa</i>	Madhur	Laghu	Sheeta	Madhur	VatapittaShamaka	1 part
2.	Water							6 parts
<i>KwathaDravyas</i> (decoction material):								
1.	<i>Pippali</i>	<i>Piper longum</i>	Katu	Laghu, Snigdha, Tikshna	Anushanashet	Madhur	VataShamaka	1 part
2.	<i>Pippalimool</i>	<i>Piper longum</i>	Katu	Laghu, Tikshna	Ushna	Katu	VataKaphaShamaka	1 part
3.	<i>Chavya</i>	<i>Piper retrofractum</i>	Katu	Laghu, Ruksha	Ushna	Katu	KaphavataShamaka	1 part
4.	<i>Chitraka</i>	<i>Plumbagozeylanica</i>	Katu	Laghu, Ruksha	Ushna	Katu	KaphavataShamaka	1 part
5.	<i>Shunthi</i>	<i>Zingiberofficinale</i>	Katu	Laghu, Snigdha	Ushna	Madhur	KaphavataShamaka	1 part
6.	Water							8 parts

### Method of preparation of Yavagu (gruel):

Collect all the ingredients of *Panchkola* and then clean, wash and dry them properly. Prepare decoction by adding 8 times of water in 5 grams of *Panchkola* which is reduced to  $1/4^{\text{th}}$  of its quantity at mild heat and is filtered. Then take 40 grams of rice along with above *Kwatha* and 6 times water is added. It is then heated at mild heat till rice is cooked<sup>[7]</sup>. The above prepared *Yavagu* is given as meal before blood donation.

### Pharmacological properties:

*Yavagu* being *Laghu* (light), it promotes digestion, causes downward movement of flatus, feces, urine and *Doshas*; causes perspiration being liquid and hot; being liquid pacifies thirst; due to combination of other substances it supplements the diet, thus increases strength<sup>[8]</sup>. *Yavagu* is *Grahi* (stops loose motions), *Balya* (strengthening), *Tarpana* (nourishing) and *Vatanashini* (relives *Vata*). *Acharya Sharangdhara* describes the quality and preparation under preparation of *Annaprakirya* (rice puddings) as the quantity of water is six times in *Yavagu*<sup>[9]</sup>. *Panchakola Siddha Yavagu* shows improvement in *Agnimandya* by its *Katu Rasa*, *Katu Vipaka* and *Ushna Virya* i.e. entire aspect of drug shows effect on the *Agnimandya*. *Yavagu* itself is considered as *Deepaniya*. It is *Agnideepana*, *Pachana* and *Rochana* in action and it pacifies *Kapha-Vata*. *Panchakola* have the *Katu Rasa*

dominancy which is *Agnideepana*, *Rochana* in action and pacifies *Kapha*. *Vipaka*: *Vipaka* of *Panchakola* is *Katu*. *Veerya* of *Panchakola* is *Ushna* according to its *Katu Rasa*.

### a) Disciplinary habits to be maintained before blood donation:

Donor should not be involved in any contradictory dietetic and in-disciplinary habits as explained above. He should not have any disease/ symptom or complaint as explained in table no. 1. Donor should be advised to correct/ leave such habits 8 days (*Nirama Avastha*) before donation<sup>[10]</sup>. He should be assessed again before donation.

### Step 3: Blood donation (Indications at the time of blood collection including medical history and mini physical check up)

#### a) Ayu (age) consideration for blood donation:

Considering the verse, that *Siramokkshana* (Bloodletting) in persons below the age of sixteen years and above seventy years should not be done<sup>[11]</sup>. A person aged between sixteen to seventy years should be allowed to donate blood. This is an ideal age for blood donation.

#### b) Matra (Quantity) of blood donated:

Bloodletting is to be done, with regard to the *Bala* (strength) of the patient and nature as well as seriousness of the disease<sup>[5]</sup>. An excessive blood loss will result in *Shiroabhitapa* (burning sensation in head), *Andhya* (blurring of vision), *Adhimantha*

(glaucoma), *Timira* (errors of refraction), *Dhatukshaya* (loss of tissues/ emaciation), *Akshepaka* (convulsive disorders), *Daha* (burning sensation), *Pakshaghata* (hemiplegia), *Angavikara* (monoplegia), *Hikka* (hiccough), *Swasa* (dyspnoea), *Kasa* (cough), *Pandu* (anemia) and may cause *Maranam* (death)<sup>[12]</sup>. Excessive bleeding produces blindness, convulsions, thirst, and darkness before eyes, headache, hemiplegia, dyspnoea, cough, hiccough, burning sensation, anemia and even death. The body is made out of blood; life is maintained by blood, so blood should be preserved at all costs<sup>[13]</sup>.

#### Calculations:

The quantity of bloodletting may be *Prastha* (540 ml), *Half Prastha* (270 ml) or quarter *Prastha* (135 ml). Normally one *Prastha* equals sixteen *Pala* but in case of bloodletting one *Prastha* should be taken equal to 13.5 *Pala*<sup>[14]</sup>.

13.5 *Pala* = 54 *Tola* = approximately 540 ml of blood (1 *Tola* = 10 ml) should be taken at each donation.

#### c) Sex:

Females should not donate blood before menarche and after menopause. Age consideration is between twelve to fifty years<sup>[15]</sup>. Female blood is considered pure as monthly shredding of blood during menses purifies *Rakta*. However, blood donation

during and within 5-7 days after menses should be avoided.

#### d) *Kala* (time) for conversion of *Rasa-Rakta* into other tissues/ number of blood

**donations a year:** The *Rasa* remains in each and every *Dhatu* (tissue) for a duration of three thousand and fifteen *Kalas*. In this way it takes one month for the *Rasa* to get converted into *Shukra* (spermatic fluid) in or menstrual blood in women. In this way eighteen thousand and ninety *Kalas* are required in all (for the *Rasa* to transfer the *Dhatus*). *Rasa* (plasma) gives rise to *Rakta* (blood) which produces *Mansa* (muscles), *Mansa* produces *Medas* (fat); *Meda* gives rise to *Asthi* (bones) which then forms *Majja* (bonemarrow); from *Majja*, *Shukra Dhatu* is produced. The *Rasa* (nutrient fluid) derived from the food and drinks provide nourishment to all the tissues mentioned above. Hence, *Rasa*, should be protected carefully by person by keeping vigilance on foods and drinks<sup>[16]</sup>.

*Rasa* and other *Dhatus* get transformed into *Shukra* (semen) in about a month's time by the action of *Pitta*, so also *Rajas* (ovum) in women<sup>[17]</sup>.

#### Calculations:

$20 + 1/10 \text{ Kala i.e. } 20.1 \text{ Kala} = 48 \text{ minutes (1 Muhurat)}$ <sup>[18]</sup>

$1 \text{ Kala} = 48/20.1 = 2.38 \text{ minutes}$   
( $3015 \times 6 =$ ) 18090 *Kala* is required to nourish all six *Dhatus* reaching *Shukra*. i.e.  $18090 \times 2.38 =$

43054 minutes, equals 717.57 hours, which is 29.89 days (approximately 30 days). Further, 5 days (which is 120 hours, equals 7199.9 minutes, and equals 3015 *Kala*) is required for *ShukraDhatu* nourishment. Nourishing organs is however a continuous process, but in case of donated blood, blood seems to regain its normal functions and components within 35 days.

**e) Indications to blood collector:**

Bloodletting should not be attempted during cold season nor very hot season, neither before sudation therapy nor after too much of sudation. It should be adopted after the person has been satisfied with *Yavagu*. Blood does not flow properly during cold season, on empty stomach, during fainting, during drowsiness, fright, intoxication, exhaustion and suppression of urine and faeces<sup>[19]</sup>. If, after blood donation, vitiation of *Vayu* along with inflammation and pain occurs, part should be smeared with lukewarm *Ghruta*<sup>[20]</sup>.

1. Above conditions/ parameters of donor should be assessed by a trained person as follows: see table no. 3.
2. Room temperature should be well maintained between and donor should be acclimatized for at least 10 minutes.
3. Whole body (external) *Snehana* (oleation) and *Swedana* (sudation) should be done to avoid *VataPrakopa*.

4. Blood donation should be done after having *Yavagu* as meal.
5. *RaktaPramana* (quantity of blood collected) should be assessed.
6. Blood donation should be followed by having *Manda* (rice water).
7. Donor should be kept under observation for 10 minutes.
8. Donor should be provided with diet chart or general instructions considering diet.

**Table No. 03: Guidelines for collecting blood**

No.	Parameters
1.	Body weight
2.	Hb %
3.	<i>Agni</i> (appetite and motion)
4.	<i>Vayayama</i> (physical activity)
5.	<i>RaktasaraPurusha</i> (according to excellence of <i>Dhatus</i> / tissues)
6.	<i>Ayu</i> (age)
7.	<i>Matra</i> (quantity of blood collected)
8.	<i>Kala</i> (date of previous blood donation)

**Step 4: Post dietetic and disciplinary management:**

**a) Dietetic management after blood donation:**

After blood donation, following facts are studied to decide diet.

1. After blood donation, intake of food and drinks which are neither very hot nor very cold, and are light and stimulant of digestion are recommended. As after donation, instability of blood is observed. Hence, power of digestion and metabolism is specially

required to be maintained<sup>[21]</sup>. If food and drinks are exceedingly cold, they will suppress *Agni* (the digestive power and metabolism); if too hot, they will add to instability of blood. So the intake of food and drinks which are not too hot or cold are recommended. Light and easily digestible food may also be given with a view to stimulate digestive power.

2. Blood-letting is followed by depletion of tissues which further leads to a depression of the digestive power and excessive aggravation of *Vayu*. Hence the patient should be given foods which are not too cold, but are light to digest, demulcent, haemanetic and are only slightly sour or are not sour at all<sup>[22]</sup>. After blood donation *Vata* tends to get aggravated filling up the vacant channels in the body produces various disorders pertaining to the entire body or one of the parts<sup>[23]</sup>. *Ghrita* along with *Sobhagya Shunthi Paka* can be advised if *Vata* seems to vitiate.

3. Site of origin and properties of *Rakta*: The *Ahara* (food), when eaten, digested and metabolized properly; its nutritious essence which is extremely fine is called *Rasa*. *Rasa* as it travels through the liver and spleen gets colored. *Rasa*, the physiological product of digestion gets colored by the normal *Tejas* (enzymes) of the body and is known as *Rakta* (blood)<sup>[24]</sup>.

4. *Rasa* reaches *Hridaya* (heart) with the help of *Samana Vayu*, gets transformed and colored by *Pitta* and becomes *Rakta* (blood). *Rakta*, found all over the body is the chief sustainer of life, possessing *Snigdha* (unctuous), *Guru* (heavy), *Chala* (movement) and *Swadu* (sweet) property.<sup>[25]</sup>

*Rakta Panchabhautika*: Other concept for origin of blood is, that blood is *Panchabhautika* (made up of the five primordial elements, viz. earth, water, fire, air, space.) as all attributes are present in the blood also; the attributes being *Vistrata* (fleshy odor), *Dravta* (fluidity), *Raga* (redness), *Spandana* (movement) and *Laghuta* (lightness)<sup>[26]</sup>.

#### ***Manda*(rice water):**

**Definition of *Manda*:** One part of rice and fourteen parts of water are boiled together. The fluid (without grains) emerging thereby is called *Manda*. This fluid mixed with powder of *Shunthi* and *Saindhava* is a good *Deepana-Pachana* (digestive and carminative)<sup>[27]</sup>.

**Quality of *Manda*:** Scum of boiled rice is free from rice pieces is a *Manda*. However, in *Peyya* though rice pieces are present but in less quantity, in *Yavagu* the pieces of cereals are in good quantity, while in *Vilepi*, the liquid portion is exceptionally present<sup>[28]</sup>.

**Table No. 04: Contents and proportion of *Manda*:**

Sr. No.	Name of the ingredients	Botanical Name	Rasa	Guna	Virya	Vipaka	Doshkar ma	Quantity
1.	Rice (paddy)	Oryza sativa	Madhura	Laghu	Sheeta	Madhura	Vatapitta Shamaka	1 part
2.	Water							14 parts
<b>PrakshepaDravyas:</b>								
1.	Shunthi	Zingiber officinale	Katu	Laghu, Snigdha	Ushna	Madhura	Kaphavat ashamaka	½
2.	Pippali	Piper longum	Katu	Laghu, Tikshana	Anushna sheeta	Madhura	VataShamaka	½
3.	Water							6

### Method of Preparation of Manda:

The *Shashti Shali* (rice grown in 60 days) was taken and then cleaned, washed and dried properly. Patient was advised to make a decoction by adding 6 times of water in 5 grams of *Pippali and Shunthi* mixture which was reduced to 1/4<sup>th</sup> of its quantity at mild heat and was filtered.

Then 40 grams of rice was taken and 14 times water was added. It was heated at mild heat till rice was cooked and was filtered to separate liquid<sup>[27]</sup>. The prepared liquid called *Manda*

### Pharmacological properties:

*Acharya Charaka* mentioned *Manda Kalpana* under *Krittana Kalpana*. *Manda* is considered better among *Krittana Varga*, it is considered *Agnivardhaka*, *Laghu*, *Vatanulomic*, *Grahi*, *Dhatusamyakara*, *Strotomardvakar*, *Swedala*, *Shrama*, *Trishna Nashaka*, *Dosha*, *Shosha*, *Kaphapitta*, *Atisara*, *Asmari* and *Jwara Nashaka*. It is *Tridoshanashaka*<sup>[29]</sup>.

*Manda* (gruel water) is appetizer, Carminative, softening for channels and diaphoretic. It supports strength due to appetizing property and lightness, in persons subjected to reducing therapy and purgation and also in those having thirst after the fat is

digested. This *Manda* added with sour pomegranates and boiled with long pepper and ginger alleviates hunger and thirst, is beneficial for channels and eliminates excreta in evacuated persons<sup>[30]</sup>.

The *Manda* prepared from fried paddy along with *Pippali* and *Nagara* is salutary to those who have undergone eliminative therapy; it is a digestive, an appetizer, a carminative and a cardi tonic<sup>[31]</sup>. *Manda* mixed with powder of *Shunthi* and *Saindhava*(rock salt) is a good *Deepana-Pachana*(digestion and assimilation)<sup>[27]</sup>.

#### **Benefits of rice water:**

Rice is rich in vitamin B<sub>5</sub> which help in better breaking down of food. They are rich in manganese, magnesium, selenium etc. Those who eat diets poor in manganese are said to have sugar craving after food as manganese helps to maintain normal blood sugars.

The health benefits of rice water includes its ability to provide fast and instant energy, regulate and improve bowel movements, stabilize blood sugar levels, and slow down the aging process, while also providing an essential source of vitamin B1 to the human body. Other benefits include its ability to increase the metabolism, aid in digestion, reduce high blood pressure, help weight loss efforts, improve the immune system and provide protection against dysentery, cancer, and heart disease.

However, besides fiber, rice also has natural antioxidants like vitamin C, vitamin-A, phenolic and flavonoid compounds, which also act as or stimulate antioxidants to scour the body for free radicals<sup>[32]</sup>.

#### ***Shritasheetajala* (boiled and cooled water):**

Water boiled to half or one forth and cooled water is beneficial for the treatment of *Daha* (burning sensation), *Atisara* (diarrhoea), disease caused by vitiated *Pitta* and *Rakta* (blood), fainting, intoxication, poisoning and also *Trishna* (thirst), *Chardi* (vomiting) and *Bhrama* (giddiness)<sup>[33]</sup>.

#### **b) Disciplinary habits to be maintained after blood donation:**

After blood donation the donor should avoid *Vayayama* (exercise), *Maithuna* (copulation), *Krodha* (anger), *Sheetasana* (cold bath), *Pravata* (cold breeze), *Ekashana* (one meal a day), *Divaswapana* (day sleep), *Kshara-Amla-Katu Bhojana* (use of alkalies, sour and pungent substance in food), *Shoka* (grief), *Vada* (too much of conversation) and *Ajirna* (indigestion) till he attains good strength<sup>[34]</sup>. These actions/ habits/ mental conditions vitiate *Vata Dosha*. However, Smoking can be done at least 30 minutes and drinking at least 24 hours after blood donation.

#### **b) Diet to be followed by regular blood donor (General instructions):**

Stop Tea, coffee, soft drinks, alcohol, skipping meals and stress. Non Suppressible Urges: *Mutra* (Urination) and *Mala* (defecation). Vitamin C should be taken along with iron rich food whole day in the form of Orange Juice, Lemon, *Amla* Juice, *Aloevera* Juice, *Chhacha* (butter milk). Fermented foods and Yoghurt should be consumed at least once in a day. Iron vessels should be used to prepare food. Milk should be avoided during treatment or it should not be consumed along with any iron rich diet. Tea/coffee etc. milk products should not be consumed immediately after meals except buttermilk. Cooking methods Adopted are, steaming, boiling, microwaving, roasting, grilling, and poaching rather than frying. Foods rich in Vitamin B12, folic acid and vitamin C should be consumed. *Sharkara*(Jaggery) should be consumed at night with *Ghee* and *Chappati*. *Go-Mutra*(cows urine) can be consumed 40 ml twice a day in morning and evening.

**c) Diet advised for regular blood donors:**

- Drinks: *Shritasheetajala* (boiled and cooled water), *Nimbupani* (lemon Juice) with 2 TSF (tea spoon full) honey with added 2-3 *Tulsi* leaf extract, beetroot juice, *Laghu Panchmool Kwatha*, *Amla* juice, *aloevera* juice and *Takra/Chaccha* (buttermilk). Juices should be prepared fresh. No tinned, canned, bottled or packed juices. Do not add sugar to juices.

*Takra/Chaccha* (with roasted and crushed *Jeera* powder) and *MridvikaArishta*.

- Cereals: *Chappati*(wheat, oats, barley, *Ragi*), oats meals (Iron fortified), whole grain bread with peanut butter. soyabean (soaked in warm water overnight)/ Sprouted grains.
- Pulses (*Dal*):*Munga*(green gram), *Mansura*(Indian brown lentils), *Arhara*(split red gram), *Kala Chaana*(black chick pea).
- Vegetables: *Palak*(spinach), *Bathua*, broccoli, *Methi* (Fenugreek), *Gobhi* (Kale), watercress, *Shimlamirch*(Capsicum), Beans, Prunes, *Muli* (raddish) *Gajjar* (carrots), *Surankanda*(*Amorphophalluscampiculatus*), *Tori*, *Parwal*(pointed gourd), Beans, *Gheeya* (bottle gourd), *Saaga* (green leafy vegetable), *Kadu*(pumpkin), *Karela*(bitter gourd), mushroom.
- Fruits: *Amruda* (Gauva), *Anara* (pomegranate) *Amala*, Apple, *Jamuna*(black plum), *Naspatti* (Pear), blackberries, blueberries, plums, oranges, *Mausami* (sweet lime), strawberries, carrots, sugarcane juice, orange juice. Fruits to be sprinkled with *Dadimashtak Churna* and lemon.
- Salad: *Chukundar*(beetroot), *Khira* (cucumber), tomato, lemon, *Draksha*, pomegranate, *Muli*(Raddish), *Gajjar*(Carrot).
- Dry fruits: *Pista* (Pistachio Nuts), *Akhrot* (Apricots), *Khajura* (dates), *Draksha* (Raisins).
- Fermented foods: *Idly*, *Dosa*, *Upma*, *Dhokla* and yoghurt (*Dahi*), add *Pippali*(*Piper longum*),

*Kali Maricha*(black pepper) powder and *Saindhava* (pink rock salt) in curd according to need.

- Oils: olive oil/ sunflower/ rapeseed oil/ mustard oil. Cow or buffalo *Ghee*(clarified butter) can be used to lubricate *Chappatis*.
- Sauces: Use tomato sauces instead of cream sauces, homemade *Pudina*(mint) or *Imily*(tamarind) *Chuttny*(sauce) are preferred.
- Spices: Avoid spices except: *Ajwayan*(caraway seeds), *Mulethi*(liquorice), *Shunthi*(dry ginger), *Dhaniya*(coriander), *Maricha*(pepper), *Haldi*(turmeric), *Saindhalavana* (pink rock salt), *Amla*(Indian gooseberry).
- Soups: *Muli Yusha*(soup), *Palak* (Spinach) *Yusha*, Sweet corn soups.
- Non-Vegetarian items:  
Egg (boiled/ poached/ half boiled).  
Red meat (heart, kidney and liver of chicken, Lamb, ham and beef).  
Fish-Salmon, Tuna and oysters, Shrimps.

#### **Contraindications:**

- *Langhana* (fasting) is contraindicated as *VataDosha* is vitiated. However, *Kala* (time) and *Matra* (quantity) for *Ahara* (food) should be considered after blood donation. Person with *Durbaala Agni* should take meal only ones a day. *Matraheena* (meal in less quantity) should be given to *Mandagni* patient<sup>[35]</sup>.
- Biscuits, cookies, candy, frozen foods, muffins, pancakes, chips, chocolates etc (bakery items)

are contraindicated. Avoid tea, caffeine, alcohol, processed foods, pizzas, partially baked bread. *Garam Masala*, Red chilli, green chilli are avoided. No milk at night. No chilli sauces.

#### **DISCUSSION:**

1. Persons indicated in ayurvedic text are not considered ideal for blood donation. However, if an individual willing to donate blood, he/ she should avoid such diet and indiscipline habits for 08 days before blood donation. By the administration of proper regimen, with due regard to the *Desha* (place), *Kala* (time) and *Satmya* (habit); pure blood is formed<sup>[36]</sup>. Hence, ideal regimen (diet and discipline) should be followed 8 days before blood donation.
2. Persons having diseases/ symptoms or complaints mentioned in table no. 1 should be first treated and then allowed to donate blood. However, he/ she should be checked for properties of *RaktasaraPurusha* (individual having excellence of blood) before donation.
3. *Ayu*: (age) Male aged sixteen to seventy years and female from twelve to fifty years are ideal for blood donation. However, female should avoid blood donation during menstruation and 5 days after it. Female blood is considered more pure in comparison to male.
4. *Matra*: On an average one unit (450 ml) of blood is collected irrespective of donors condition. However in ayurveda, quantity of

blood donation varies according to individual. It should be 540 ml, 270 ml or 135 ml.

5. *Kala*: A healthy donor may donate red blood cells every 56 days, or double red cells every 112 days. A healthy donor may donate platelets as few as 7 days apart, but a maximum of 24 times a year<sup>1</sup>. But considering calculations for *Kala* (time), if a donor is provided with dietetic, disciplinary management, before and after blood donation, blood seems to regain its normal functions and components in 35 days. Further, donor is advised to leave/ correct his diet and disciplinary habits 8 days (*NiramaAvastha*) before blood donation. Donor's *Agni* is corrected in 7, 5 or 3 days for 540 ml, 270 ml or 135 ml blood collected respectively. Hence, ideal blood donation can be done after 50 days (35+8+7), 48 days (35+8+5) or 46 days (35+8+3).
6. Blood seems to be vitiated in *SharadRitu* (autumn season) i.e. two months duration. Excluding those two months, ideal blood donation can be done at the maximum of six times a year.
7. As a spark of fire gets kindled into a big and stable flame when fed gradually with dry grass, cow-dung cake, etc., similarly the digestive fire or the enzymes in the body responsible for digestion and metabolism (which subdue because of purificatory measures viz. bloodletting) in a purified person

grows strong, becomes stable and becomes capable of digesting all types of food by the gradual administration of *Peyaadi* (thin gruels)<sup>[37]</sup>.

#### CONCLUSION:

According to ayurveda blood donation should be simple four-step process: 1. Assessment and registration of an ideal donor, 2. pre dietetic and disciplinary management, 3. blood donation (Indications at the time of blood collection (including medical history and mini-physical check-up) and 4. post dietetic and disciplinary management.

Factors like, body weight, Hb %, status of *Agni*, *Vayayama* (physical activity/ occupation), signs of *Raktasara Purusha* (individual having excellence of blood), *Ayu* (age), *Matra* (quantity of blood), and *Kala* (time) should be taken care by the blood collector at the time of blood donation.

Following 08 days *Niramma Avastha* (correction period), 35 days for *DhatuPoshana* (nourishment of tissues) and 7 days of *Samsarjan Karma*, blood donation can be done again. That means after 50 days. Also, blood donation is contraindicated during 2 months of *SharadRitu*. So, a person can be an ideal donor for maximum of 5 to 6 times a year.

People desirable/ willing for blood donation should follow proper diet, disciplinary and mental habits. They should

take *Shodhana* (purification procedure) like *Nitya Virechana* (purgation on regular basis).

*Yavagu* (Gruel): *Panchkola Sidha Yavagu* is advised immediately before blood donation and *Manda* (rice water) is advised after blood donation to pacify *Vata Dosha*. Diet to be followed by regular blood donors are discussed for maintenance and regulation of body functions.

Under IEC program (information, education and counseling); benefits of blood donation should be promoted among donors. They are guided for health promotion and disease prevention through bloodletting. As there is no alternative to human blood and its demand is increasing, so, to cope up the needs, people should be encouraged and health of regular donors should be taken care. Ideal blood donation should be followed to provide good quality blood to the recipient. Further, donor remains healthy if diet and disciplinary habits are followed.

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