

**CONSIDERATION OF DIET IN WOUND HEALING****<sup>1</sup>\*Prerna Verma and <sup>2</sup>Prof. S. J. Gupta**<sup>1</sup>Senior Resident, Department of Shalya Tantra, IMS, BHU.<sup>2</sup>Professor, Department of Shalya Tantra, IMS, BHU.Article Received on  
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of Shalya Tantra, IMS, BHU.**ABSTRACT**

Good nutritional status is essential for wound healing: Ignorance of nutritional status decreases the patient's ability to heal and subsequently prolong the stages of wound healing. Thus, adequate nutrition provides power source for wound healing and promotes angiogenesis and deposition of new tissue. Malnourished patient's can develop pressure ulcers, infections and delayed wound healing which results in chronic non-healing wounds. Shalya Tantra is one of the important branch of Ayurveda, in which surgical and parasurgical techniques has been described for the management of various diseases.

Vrana is the most important and widely elaborated in Shalya Tantra. In Ayurveda, Sushruta has clearly mentioned about diet and its importance in wound healing process. Adequate balanced diet helps a lot in wound healing process. For healing wounds, our body needs several nutrients like protein, iron, carbohydrates, vitamins, zinc, amino acids and others. Integrated wound care with managed diets can give better prognosis and can also increase life expectancy. Balanced diet, enables quick reaction to the wound as well as enhances the healing capabilities throughout the curative process. Nutrients not only facilitates healing but also improves the quality of life.

**INTRODUCTION**

In the present era, as there is remarkable increase in number of wound cases, treatment modalities like antibiotics and local management is not sufficient for wound healing.

Along with this, a well balanced diet becomes essential for wound healing process.

Wound infection as well as delayed wound healing acts as burden on health care system. That's why nutritional support needs to be considered as fundamental part of wound management.

Acharya Sushruta has mentioned that the diet plays an important role in the healing of wound.

This review provides current information on the management of nutrition for simple acute wounds to complex non-healing wounds and offers insights to future innovative treatments.

### **PATHOPHYSIOLOGY OF WOUND HEALING IN AYURVEDA**

The break or discontinuity of body tissue or part of body is called "Vrana".

#### **Factors influencing wound healing in Ayurveda**

Sushruta Samhita has very well explained the factors which influences the wound healing. These factors include *vaya* (Age), *Poshak tatwa*(Nutrients) and diseases like *Madhumeha*, *Pandu* etc.

Local factors include *twaka sthana*(position of skin), *shalya* (foreign bodies), *bhutsanghata*(infection) etc.

### **AN AYURVEDIC ASPECT OF DIET IN WOUND HEALING**

*Pathya ahara* plays an important role in healing of wound. *Ahara* plays an important role in wound healing process as nutritional supplements ensure proper proteins, vitamins and minerals etc.

The diet of patient having wound should consists of *laghu ahara*(light diet) in small quantities.

Freshly cooked food along with *goghrita* should be taken.

Above all, digestive upsets should be avoided. *Ahara* which increases *Kapha* and *Vata dosha* and possess cold properties should be avoided.

Dietetic constituents, as prescribed by *Acharya Sushruta*, should be advised for rapid healing and to avoid any complications.

Hot liquified food like *Manda*, *Peya*, *Vilepi* prepared from old rice, mixed with *Goghrita* in small quantity with *mamsa rasa*, a good diet for patient by which quick healing of wound occurs.

### **PATHYA AHARA IN AYURVEDA**

*Puraan shastika shaali*, *jeevanthi shaaka*, *jangala mamsa*, *Tanduleeyaka shaaka*, *Vaastuka*, *Balamulaka*, *Vaartaka*, *Patola*, *kaarvellaka*, *daadima*, *saindhava lavana*, *puraan sarpi*, *moong*, *vilepi*, *srutha jala*.

**PURAAAN SHASTIKA SHAALI:** *Puraan Shastika Shaali* is *Tridoshaghna*<sup>[1]</sup> i.e balances all three doshas vata, Pitta, Kapha.

It stimulates the digestive fire and helps to promote virility.

It is very much useful in internal wounds, peptic ulcers and mouth ulcers.

Also used to treat fever, neurological disorders, digestive problems, respiratory illness.

*Shaali dhanya* is advised by *Yogaratanakar*, *Bhaishajya Ratnavali*, as it is *laghu*, *Tridoshanashaka*.

Consumption of *Nav Shastika Shaali* is beneficial in Psoriasis, liver cirrhosis and piles.

**JANGALA MAMSA:** Substances which are used for *Brimhana* (nourishing karma possess heavy, cold, soft, unctuous, thick, gross, slimy, sluggish, stable and smooth qualities.

Most of the *Jangala mamsa* has the qualities like heavy, cold, soft, unctuous.

According to *Sushruta Samhita* and *Ashtang Hridaya*, *Jangala mamsa* is *pathyakar* for *vranita*.

Specially, *mamsa* of *Jangal mruga* and *pakshi* is advised for wound patients by *Yogaratanakar* and *Bhaishajyaratnavali*.

As *Jangala mamsa* is *laghu* and *balyakar*.<sup>[2]</sup>

Apart from having high quantity of *Protein*, *mamsa* also have essential amino acids, unsaturated fatty acids, various vitamins and minerals which make it highly nutritive food, which helps to get ideal body built.

**MUDGA:** *Mudga* from *Shimbi dhanya varga* is *pathyakar* in *vranita*.

*Mudga* is the main source of protein and has anti-microbial and anti-inflammatory action.<sup>[3]</sup>

*Mudga* is described as “*Sarva-hitkari*”<sup>[4]</sup> in Ayurvedic classics.

*Mudga* is also rich source of Vitamin B6, A, C, Iron, Magnesium, Calcium and Potassium.

But in regards to quality, vegetable proteins are inferior to animal proteins.

**SAINDHAAVA LAVANA:** It is considered superior to the normal cooking salt as it has less water retention capacity. Thus it is best for those suffering from cardiac diseases, hypertension and renal diseases.

*Saindhava* is mentioned as *avidahi* and *Tridoshaghna*.<sup>[5]</sup>

It is also used as *Vrana Shodhaka* and *Ropana*. Also helps in strengthening skin tissue to rejuvenate the skin.

**AMALAKI:** It is the greatest source of Vitamin C. The active constituents in *Amalaki* are phyllembin, Gallic Acid, Tannins, Pectins and Ascorbic acid.

*Amalaki* alleviates *Tridoshas* and specially normalizes *Pitta dosha*. It is rich in Vitamin C and contains many minerals and vitamins like calcium, Phosphorus, iron, carotene and vitamin B complex.

*Amalaki* is also powerful anti-oxidant and acts as an anti-ageing agent.

**YAVA:** Yava is described under *Shukadhanya* *varga* in Ayurveda.

*Yava* is described as both '*Pathya*' and '*Aushadha*', in ancient texts and modern researches.

*Yava* is described as *Pitta-Kapha shamaka* and *Sara gunatmaka*.<sup>[6]</sup>

*Yava* is *pathyakar*, for *vranita* according to *Vagbhatta*, *Yogaratanakar* and *Bhaishajya Ratnavali* because of its anti-inflammatory effect.

**ANTARIKSHA JALA:** It is the purest water, as described in ancient texts.

It is vital for life, maintains the body, invigorating and decreases tiredness, lethargy, thirst, intoxication, fainting, drowsiness, sleep and burning sensation and is always highly beneficial.

**MADHU (HONEY):** It's major constituents are 38.2% fructose, 31% glucose, 1.5% sucrose and 9% of other sugars, along with water and small amounts of vitamins, minerals and enzymes.

Madhu is also used topically as an antiseptic and as therapeutic agent for the treatment of ulcers, burns and wounds.

It is used as *Vrana shodhana*, *Sroto shodhana*, *lekhana*, *Sandhana*<sup>[7]</sup>, *Ropana*, *Chedana*.

It is best to reduce cholesterol and thus prevents diseases like Coronary Artery Disease and also prevents obesity.

In *shaka varga*, Acharya Sushruta, Vagbhatta, Yogaratnakar and Bhaishajyaratnavali has mentioned *Balmulak*, *vartaka*, *patola* and *Karvellaka* as *pathyakar* for *vranita*.

**BALMULAKA (RADISH):** In Ayurvedic classics, *balmulaka* is described as *Vrana-nashaka*.<sup>[8]</sup> It is also a rich source of Vit C, B9, Copper and Potassium.

**VARTAKA:** According to Ayurvedic texts, *vartaka* has the property of *Agni-varhdhana*.<sup>[9]</sup> Major nutrients found in *Vartaka* are Vit B6, Vit C, Magnesium, Copper and Phosphorus.

**KARVELLAKA:** *Karvellaka* is commonly used for its anti-diabetic, anti-oxidant and antibacterial properties.

It improves and accelerates the process of wound healing.

*Karvellaka* is rich in Vit. A, B, C and minerals like iron, folic acid, zinc Manganese, Copper and amino acids like Glutamic acid. Also Glutamic acid is precursor for the synthesis of fibroblasts and macrophages.

**PATOL:** *Patol* is described as *krimighna*<sup>[10]</sup>, in *Ayurvedic Classics*. *Patol* is also rich in Vitamin A and C.

*Tanduliyaka* is mentioned as *pathyakar shaka* for *vranita* in *Sushruta Samhita*, *Ashtang Hridaya* and *Yogaratnakara*.

*Tanduliyaka* has been described as *Rakta -Pitta shamaka* and *Visha- nashaka*.<sup>[11]</sup> *Tanduliyaka* is richest source of Manganese, Copper, Iron, Magnesium.

Acharya Sushruta, Vagbhatta and Bhaishajyaratnavalikar has described *Jeevanti*, *Sunnishannak* and *Vastuka* as *Pathyakar*.

*Jeevanti* has been mentioned as “*Sarva- doshaghna*”.<sup>[12]</sup>

*Jeevanti* is also found to contain Iron, Copper, Zinc and Manganese.

Both *Sunnishannak* and *Vastuka* are “*Agni-Vardhaka*” and *Tridoshaghna*.<sup>[13]</sup>

*Vaastuka* also found to contain Vitamin C, Potassium, Sodium Calcium, Iron and Zinc in high contents.

According to *Bhaishajya Ratnavalikar*, *Nimba -patra* is *pathyakar* for *vranita*. *Nimba patra* is bitter in taste. That's why helps in *Pachan*. Also, neem leaves has anti-inflammatory and anti-oxidant action.<sup>[14]</sup>

In **Fala Varga**, *Dadima*, *Amalaki*, *Panas*, *Mocha*, *Draksha* are described as *Pathyakar* for *vranita* in *Sushruta Samhita* and *Ashtang Hridaya*.

**DADIMA** – Dadim is mentioned as *Hridya*, *Deepan* and *Tridoshaghna*.<sup>[15]</sup>

Dadima is also rich in Vit C and A, calcium and Magnesium.

**VILEPI** is described as *pathyakar ahar* in *Sushruta Samhita*, *Yogaratanakar* and *Bhaishajyaratnawali*. Vilepi has *Grahi* and *Deepan* action<sup>[16]</sup> as *Vilepi* is *laghu* and *balyakar*.

**LAJA-MAND** is mentioned as *pathyakar ahar* for *vranita* in *Yogaratanakar* and *Bhaishajyaratnavali*. *Laja-mand* does *Deepan* and *Pachan* karma.<sup>[17]</sup>

**Shrut jal** i.e warm water is advised for *vranit* by Acharya *Sushruta* as *shrut jal* is *laghu*<sup>[18]</sup> and has *Deepan- Pachan* action.

#### **APATHYA AHARA**

*Nava Dhanya*, *masha*, *tila*, *vishama bhojana*, *ati bhojana*, *upavasa*, *viruddha bhojana*, *adhyashana*, *kulattha*, *nishpava*, *amla-lavana-katu rasa*, *vallura mamsa*, *shushka shaaka*, *vasa*, *sheetodaka*, *Madhya*.

So, these *ahaara* must be avoided during wound healing time.

#### **NUTRIENTS INVOLVED IN CONNECTIVE TISSUE SYNTHESIS AND WOUND HEALING**

Collagen fibers and proteoglycan synthesis are dependent on the supply of nutrient building blocks, such as aminoacids and amino sugars.

Vitamins and minerals are also needed for many enzymatic reactions involved in connective tissue rebuilding.

Some of the nutrients that are involved in connective tissue repair and wound healing are as follows:

#### **CARBOHYDRATES**

Carbohydrates sources includes whole grain cereals, rice, bread etc.

Carbohydrates intake provides energy which is essential for optimal healing.

#### **PROTIENS**

Essential for maintenance and repair of body tissue.

Adequate protein levels help to achieve optimal wound healing.

Sources of protein includes eggs, white meats, fish, liver and dairy products (milk, cheese and yoghurt), soyabean, legumes, seeds, nuts and grains.

### **AMINOACIDS**

Collagen fibres are made up of long chains of amino acids.

### **L-ARGININE**

Dietary supplementation with arginine enhances protein metabolism, helps to decrease muscle loss and collagen synthesis, which helps to increase the strength of wound.

### **FATS**

Sources of fats to promote wound healing include meat, full fat dairy products such as milk, cheese, butter, creams and oils.

Fats (mono and polyunsaturated fats) provides fuel for wound healing.

### **VITAMIN A**

Sources of Vitamin A are: milk, cheese, eggs, fish, dark green vegetables. Vitamin A increases the inflammatory response in wounds, stimulating collagen synthesis.

### **VITAMIN C**

Considered as important water-soluble anti-oxidant. Vitamin C is required for collagen fibre synthesis, a process vital for tissue repair and healing.

Deficiency in Vitamin C is associated with poor collagen formation and delayed wound healing.

### **VITAMIN E**

Vitamin E supplementation reduces free radical damage and helps in wound healing and connective tissue repair.

### **ROLE OF MINERALS**

Zinc, Copper and Manganese for superoxide dismutase (SOD) induction.

Superoxide Dismutase(SOD) is an antioxidant enzyme.

This enzyme plays an important role in wound healing.

Dietary zinc sources include red meat, fish, milk products, eggs.

**Iron**

Sources of iron in diet- Red meat, fish, eggs, whole meal bread, dried fruits, nuts.

Iron provides oxygen to the site of the wound.

**Energy**

Main sources of energy for the humans and for wound healing are carbohydrates and fats.

Main demand for energy is for collagen synthesis.

**Fluid Maintenance**

Hydration is important in wound healing, as dehydrated skin is less elastic, more fragile and more susceptible to breakdown.

**GOGHRITA**

*Goghrita* as described in Ayurveda is *Saptadhatu vardhak*, *Ojovardhaka* and is advised to take in day to day life. Hence, *Goghrita* with several beneficial effects on human body and mind, holds an important place in Ayurvedic Chikitsa.

That's why *Goghrita* is used since ancient times including the Vedic Kala.

*Goghrita* taken regularly in small doses is invaluable as it increases the digestive capacity as well as have nourishing property.

The anti-oxidants present in *Goghrita* make it a miraculous *Rasayana* and thus it is useful in many diseases.

Regenerative properties of *Goghrita* not only heals wound but also promotes the growth of healthy cells. Wound healing ability of *Goghrita* is even clinically proven.

*Goghrita*, is rich in Vit A and Vit D, which is essential for collagen synthesis.

**SPECIAL CONSIDERATION OF DIET IN WOUND HEALING**

*Laghu ahara* (light diet) in small quantities must be recommended.

One should consume freshly cooked food.

*Mamsa/Peya/Vilepi* mixed with *Goghrita* and *Mamsa rasa* helps in wound healing.

*Ahara* which increases *Kapha* and *Vata dosha* and possess cold properties should be avoided.

**CONCLUSION**

This review demonstrates the intrinsic link between nutrition and wound healing and the need to ensure that macro, micro-nutrients and fluid requirements are met in order to promote good skin condition and to maintain and repair tissues.



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