EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 5
Issue: 9
229-231
Year: 2018

ROLE OF DIET AND NUTRITIONAL SUPPLEMENT IN WOUND HEALING PROCESS

Dr. Shivakant Bharat Nath Yadav*[1] and Dr. V. S. Rudrappagol[2]

[1]P.G. (Scholar), Samanya Shalya, Dept. of Shalyatantra, L.K.R. Ayurvedic Mahavidyalaya, P.G. Training and Research Centre, Gadhinglaj, Dist. Kolhapur – 416502, India.
[2]Guide and HOD, Dept. of Shalyatantra, L.K.R. Ayurvedic Mahavidyalaya, P.G. Training and Research Centre, Gadhinglaj, Dist. Kolhapur – 416502, India.

***Corresponding Author: Dr. Shivakant Bharat Nath Yadav**
P.G. (Scholar), Samanya Shalya, Dept. of Shalyatantra, L.K.R. Ayurvedic Mahavidyalaya, P.G. Training and Research Centre, Gadhinglaj, Dist. Kolhapur – 416502, India.

Article Received on 13/07/2018 **Article Revised on 02/08/2018** **Article Accepted on 22/08/2018**

ABSTRACT
The selection of dietary material and dietary rue play important role towards the healthy living, diet not only offers nutritional supplement to the body but also provides beneficial effects in various pathological conditions such as; wound healing. The literature study revealed that consumption of balanced diet plays important role in wound healing since it boosts process of regeneration and enhances other curative process of body. This article described role of diet and nutritional supplements in wound healing process. Article also suggested diets which need to be taken to get early relief from chronic wounds.

KEYWORDS: *Wound, Diet, Healing, Regeneration.*

INTRODUCTION

Wound defined as destruction/break/rupture/discontinuity of body parts. Chronic wounds which take more than 4-6 weeks to heal and peoples living in unhygienic condition suffer majorly with chronic wounds. Prevalence of wound not only increase healthcare burden but also impart economic diversity.

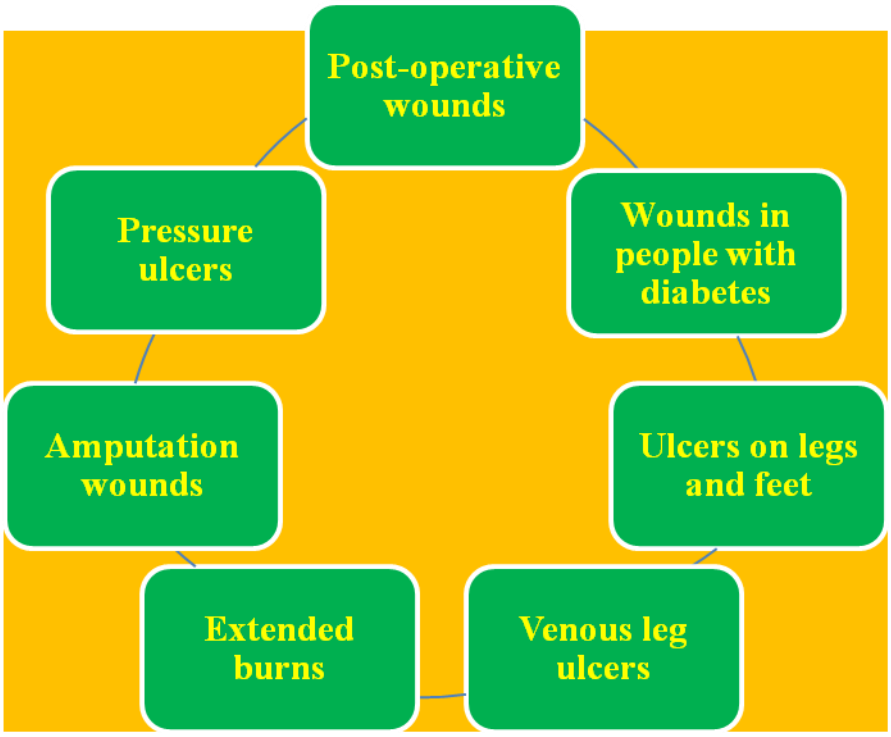

Figure 1: Examples of chronic wounds.

Risk factors associated with chronic wounds

Chronic wounds may occur in any individual but more frequent in the elderly, ill and diabetic persons. The frequency of ulcers and lower limb amputations caused by chronic ulcers in people with diabetes has constantly increased. Individuals with hip fracture are at risk of developing pressure ulcers, as are individuals with neurological impairment and those who are immobile for prolonged periods of time. Other wounds at risk of delayed healing are wounds in oncology patients and stomas.

Factors associated with delayed wound healing

- Arthritis
- Chronic liver disease
- Diabetes
- Excess alcohol intake
- Impaired self-caring
- Inadequate nutrition
- Inflammatory disease
- Poor circulation
- Poor cognition/cognitive I dysfunction t
- Renal failure
- Vascular disease
- Weakened immune system

Factors influencing wound healing

There are four phases of wound healing which may affected by certain factors such as; age, nutrients and the diseases like diabetic and anemia etc. Local factors including position of skin; foreign bodies and infection etc. also affect process of wound healing.

Table 1: Phases of wound healing.

S. No.	Phase of Healing	Time of post Industry
1	Hemostasis	Immediate
2	Inflammation	Day 1 – 4
3.	Proliferation (granulation and contraction)	Day 4 – 21
4.	Remodelling (Maturation)	Day 21-2 years.

Nutrition in wound healing

There is a large body of evidence demonstrating the essential role of nutrition in wound healing, without adequate nutrition, healing may be impaired and prolonged. Improved nutritional status enables the body to heal wounds such as the accelerated wound healing seen with nutritional supplementation. When the body sustains a wound, stress hormones are released in a fight or- flight reaction and the metabolism alters in order to supply the injured area with the nutrients it needs to heal; known as the catabolic phase. The body experiences an increased metabolic rate, loss of total body water, and increased collagen and cellular turn over. These effects can be pronounced even with a small wound. If the catabolic phase is prolonged and/or the body is not provided with adequate nutrient supplies, then the body can enter a protein energy malnutrition (PEM) state.

Protein-energy malnutrition (PEM) is the most serious type of malnutrition - where there is an inadequate or impaired absorption of both protein and energy. PEM causes the body to break down protein for energy, reducing the supply of amino acids needed to maintain body proteins and healing and causing loss of lean body mass. PEM can be defined as low Body Mass Index (BMI) or unintentional weight loss (of 5% or more) with loss of subcutaneous fat and/or muscle wasting.

Nutrition for chronic wounds needs to be assessed on an individual basis, however pressure ulcers especially larger or multiple ulcers and ulcers on legs in people with diabetes place high demand for nutrients on the body. Infected wounds also increase nutrient demand as they cause more tissue damage. Protein loss *via* wound exudates needs to be monitored. If dressings are being changed frequently due to the amount of exudates, protein is being lost at a high rate and therefore protein replacement should be considered.

Protein is essential for the maintenance and repair of body tissue. Depleted protein levels will cause a decrease in collagen development, slowing the wound healing process. Adequate protein levels will help achieve optimal wound healing rates. In slow to heal/chronic wounds 3 recommended daily intake of 1.5g/ kg/day will meet the protein needs of most individuals, but up to 3g/kg/ day may be appropriate for those with more severe wounds. Sources of protein include red and white meat, fish, eggs, liver, dairy products (milk, cheese and yoghurt) soy beans, legumes, seeds, nuts and grains.

Following Edible Materials Offers Relief in Wound Healing Process

Amino acids

Dietary supplementation with arginine has been shown to enhance protein metabolism helping to decrease muscle loss and collagen synthesis, which helps to increase the strength of the wound. In addition, l-arginine is essential for the stimulation of the nitric oxide pathway, which is in turn important for collagen deposition in wound healing. L-Arginine supplementation has also been shown to enhance the immune system and improve the secretion of growth hormone and insulin that are also involved in wound healing.

Fats

Fats, including mono and polyunsaturated fats provide fuel for wound healing. Fats are a safe and concentrated source of energy. Adequate fats are needed to prevent the body using protein for energy.

Carbohydrates

It is not clear how carbohydrate deficiency influences wound healing but increased carbohydrate intake provides energy that is essential for optimal healing. Carbohydrate sources include wholegrain cereals, breads, potatoes, rice, pasta and biscuits.

Vitamin A

"Vitamin A" increases the inflammatory response in wounds, stimulating collagen synthesis. Low "vitamin A" levels can result in delayed wound healing and susceptibility to infection. It has also been shown that vitamin A can restore wound healing impaired by long term steroid therapy or by diabetes. "Vitamin A" is found in milk, cheese, eggs, fish, dark green Vegetables, oranges, red fruits and vegetables.

Vitamin C

"Vitamin C" plays an important role in collagen synthesis and subsequent cross linking as well as the formation of new blood vessels (angiogenesis). Adequate "vitamin C" levels help strengthen the healing wound. Research has shown "vitamin C" supplementation helps promote pressure ulcer healing. "Vitamin C" is found mostly in fruit and vegetables, especially oranges, grapefruit, tomatoes and leafy vegetables. Fruit juices with added "vitamin C" are also a good source, although often they contain only small amounts of "vitamin C".

Minerals

Zinc

Zinc plays a key role in protein and collegen synthesis and in tissue growth and healing. Dietary zinc sources include red meat, fish and shellfish, milk products, poultry and eggs.

Iron

Iron is part of the system that provides oxygen to the site of the wound; therefore iron (haemoglobin) deficiency can impair healing. The best sources of iron in the diet are red meat, offal, fish, eggs, whole meal bread, dark green leafy vegetables, dried fruits, nuts and yeast extracts.

Factors that may hinder adequate nutrient intake

- Poor eyesight
- Anxiety
- Poor dentition
- Pain
- Eating environment
- Packaging of food
- Confusion and/or altered level of alertness.
- Difficulty swallowing, e.g. due to Parkinson's disease or other neurological conditions
- Individual food preferences e.g. cultural food choices, vegetarian.
- Lack of manual dexterity e.g. due to arthritis, peripheral vascular disease, neurological conditions.
- Taste changes, reduced appetite
- Feeding routines in institutions e.g. tray collection times.

CONCLUSION

Holistic wound care must include both nutritional support and supplementation where necessary according to an individual's needs. A nutrient rich diet is fundamental, but sometimes it is not possible to achieve adequate levels of essential nutrients through normal consumption of food and liquids. In these cases, nutritional supplementation has been shown to promote process of wound healing.

REFERENCES

1. Watters CA, Tredget EE, Cooper C. Nutrition and wound healing in burns, trauma, and sepsis. In: Milnar JA, editor., ed. Nutrition and Wound Healing. Boca Raton, FL: CRC Press, 2007: 219–260.
2. Eneroth, M, Apelqvist, J, Larsson, J, and Persson, B.M. Improved wound healing in transtibial amputees receiving supplementary nutrition. *Int Orthop*., 1997; 21: 104–108.
3. Breslow, R.A, Hallfrisch, J, Guy, D.G, Crawley, B, and Goldberg, A.P. The importance of dietary protein in healing pressure ulcers. *J Am Geriatr Soc*., 1993; 41: 357–362.
4. Molnar JA, Burke JF. Nutritional aspects of surgical physiology. In: Burke JF, editor. , ed. Surgical Physiology. Philadelphia, PA: W.B. Saunders Company, 1983: 249–269.
5. Suzuki K. Counseling wound care patients on nutrition and supplements. *Podiatry Today*, 2016; 29(3): 28–29.
6. Cleveland Clinic *Nutrition guidelines to improve wound healing*. Cleveland, OH; 2014 Sep 23. https://my.clevelandclinic.org/health/articles/11111-nutrition-guidelines-to-improve-wound-healing.