Canterbury Branch of the New Zealand Wound Care Society

Education Evening Report - 22nd April 2021

Research: The Benefits of Vitamin C for Wound Healing

Guest Speakers:

Margreet Vissers | Research Professor, Centre for Free Radical Research Department of Pathology and Biomedical Science | University of Otago, Christchurch

Juliet Pullar | PhD, DPH, Research Fellow Department of Pathology and Biomedical Science University of Otago, Christchurch | Te Whare Wānanga o Otāgo ki Ōtautahi

Dorothy Cabunilas MSc. Research Nurse,
University of Otago

Our first education evening for 2021 was a two-hour session on the limited research in the field of Vitamin C and wound healing.

Professor Vissers gave us an excellent introduction to Vitamin C and its role in our bodies. Also known as ascorbic acid; it is necessary for the growth and development and repair of all body tissues. Vitamin C functions as a cofactor in many enzymatic reactions in animals that mediate a variety of essential biological functions: gene function, energy production, blood vessel formation, energy production, wound healing, collagen syntheses, absorption of iron, the proper functioning of the immune system, and the maintenance of cartilage, bones and teeth.

Ascorbate circulates in our bodies, is highly water soluble and does not get stored; it always turns over, so that is why you need to take it daily for it to be replenished. Vitamin C is present in all plants and animals that are not cooked, fresh fruit and vegetables with varying levels. Oranges have a high level; you need to eat 6-8 apples for 1 orange and about 15 bananas to achieve the levels to that in 1 orange.

The blood stream is the delivery system, and ascorbate gets filtered out in the kidneys when the body reaches saturation levels of 100µmol/l (excess gets passed out).

So how much Vitamin C do we need? No toxicity level has reached for vitamin C intake. In NZ the RDA is 45mg, but Professor Vissers discussed that this level is not high enough for health promotion; in the EU the RDA is 200mg per day. At higher intake

levels, the plasma ascorbate reaches a plateau at about 80µmol/l per day due to the decrease absorption rates and increased excretion.

Dr Juliet Pullar discussed the functions of Vitamin C and discussed several studies about chronic wounds and Vitamin C including one that her team was involved in, the Zespri study. A kiwifruit study that asked participants to have 250mg (2x kiwi fruit) per day.

The functions of vitamin C include the following;

- antioxidant function in the skin- UV protection
- Cell signaling regulation of cellular processes.
- Immune cell function
- Collagen synthesis

Pullar discussed the interesting study by John Crandon, a surgeon at Harvard Medical School, in 1939, did an experimental study looking at human scurvy. Investigating prolonged Vitamin C deficiency. He placed himself on a diet of bread, crackers, cheese, eggs, beer, pure chocolate, and no sugar with supplements of yeasts and all the known vitamins except vitamin C. From 6 weeks onwards no ascorbic acid could be detected in his blood plasma. After 2 weeks he began to feel fatigued. At 26 weeks a self-inflicted wound made show no signs of healing within 10 days. He was given 1g of ascorbic acid by intravenous injection each day for a week and then the wound healed rapidly within the following 10 days.

Pullar proposed some research questions yet to be answered. Do patients with chronic wounds have low vitamin C status and will increasing Vitamin C increase the rate of healing as an adjunct to standard wound management.

Dorothy Cabunilas shared with us her work for her master's thesis, Vitamin C and Chronic Wounds. She wanted to see if there is an association between Vitamin C and wound healing and is there any predictable variations of Vitamin C levels in chronic wounds. The study was a cross sectional study, the cohort being patients attending the wound clinic at Nurse Maude. N=54. Almost 50% of the cohort had a deficiency in plasma Vit C. There was an inverse correlation between Vit C and BMI; the higher the BMI the lower the plasma vitamin C status. The conclusion of the study, Cabunilas suggested that there is strong evidence to suggest that that Vit C supplementation may improve wound healing.