

the argument that coconut oil has no cholesterol rising property, the metabolism of C12 from the main fatty acid lauric acid can be traced by nucleotide scanning

The beneficial effect of either oil in specific medical conditions (therapeutic effect) are explored but not in a systematic way. The disease conditions which are likely to be benefited from the use of either oil should be

identified using standard diagnostic criteria. A hypothesis on the mechanism by which coconut oil improves the disease pathology will help to search the mechanism of action and to define the clinical and laboratory criteria of treatment benefit. Finally it should undergo randomized multi centric clinical trials to have substantial level of evidence ■



Virgin coconut oil cures HIV/AIDS

● **Kadek Dharma Widhiarta**

Obstetrics and Gynecology Specialist, Faculty of medicine, University of Jember, Indonesia

HIV/AIDS is a global crisis, affecting many aspects of life. Social stigma and the economic cost of HIV/AIDS have been haunting many patients, societies and governments. The cost of treatment and prevention measures has been a serious burden not only for developing countries, but industrialized one as well. Since the first report of HIV infection in 1981, more than 40 million people have been infected, and more than 20 millions have died from AIDS.

Prevalence of AIDS varies among countries and the highest occurrence is reported from the Sub Sahara region of Africa, which has recorded a 30% rate of infection. It is estimated, that the numbers of HIV/AIDS patients will rise significantly. In Indonesia, the first case of AIDS was reported on a foreign tourist in Bali in 1987. HIV/AIDS has spread to all the provinces of Indonesia. No concrete data is available on the number of persons suffering from this disease, but it is estimated that around 80,000 to 1,20,000 Indonesians are HIV positive.

HIV mainly destroys the immune system, causing decreased quantity and quality of lymphocyte T cells, especially CD4. Progressiveness of the disease depend mainly on the host immune response, which is measured by the amount of CD4 in the body (CD4 count). Therefore, CD4 count is the base of HIV infection classification. Nutrition is well known for its immune response stimulation effects. Malnutrition can aggravate the disease by up regulating viral

replication. On the other hand, achievement of optimal nutritional intake will ensure adequate immune response of HIV patients.

Coconut oil has long been used not only as food, but also as traditional remedies. Indigenous population of the Asia Pacific, which consumes coconut and coconut oil has long been known to have healthy and long lives. Despite of its numerous benefits, many publications have focused on the negative effects of coconut oil. Their focus is on the high content of saturated fatty acids (SAFA). Saturated fatty acid is believed to be the main cause of arterial coronary diseases. This belief has caused people to turn to other source of plant oil, with low level of SAFA in their daily food consumption. This notorious belief is not entirely true, because SAFA in coconut oil, consist mainly of medium chain triglyceride/MCT which have many beneficial health effects.

Coconut oil is not only a source of medium chain fatty acids which are easier to absorb and utilize by cells, it also contain lauric acid and capric acid, which

Table 1. Weight, height, and body mass index

Variable		VCO (n=14)	Non-VCO (n=14)	p
Weight (kg)	Before treatment	53,7 ± 7,78	56,0 ± 7,96	0,291 ^m
	After treatment	54,0 ± 7,46	55,8 ± 7,64	0,358 ^m
Height (m)	Before treatment	160,5 ± 7,03	164,6 ± 4,83	0,082 ^t
	After treatment	160,5 ± 7,12	164,6 ± 4,83	0,09 ^t
Body mass index (kg/sqm)	Before treatment	20,8 ± 2,29	20,7 ± 3,38	0,55 ^m
	After treatment	20,9 ± 2,06	20,7 ± 3,21	0,811 ^t

m = Mann-Whitney U t = independent t test

sis have anti microbial effects. These substances can destroy bacteria and of virus which have lipid layer on their of cell membrane. Because of its fatty ed acids and other nutrients content, of coconut oil is thought to be beneficial to HIV patients.

An experimental study was conducted at Dharmas Cancer Hospital Special Clinic, Jakarta for six weeks between June and August 2006. Written consent was obtained from all subjects or their legal guardians. The study was conducted in HIV positive with CD4+ count > 200 cell/ μ L aged between 18 and 59 years, and without antiretroviral (ARV) treatment. Exclusion criteria included chronic protein energy malnutrition (body mass index < 17 kg/sqm), history of cardiovascular disease and diabetes mellitus (from anamnesis), pregnant, and breast feeding. Subjects were removed from the study if they refused to continue the trial or if there were any difficulty to follow protocol or in case of death.

Forty subjects who met inclusion criteria were admitted to this study. The subjects were selected using block-randomized method into two groups designated as VCO and non-VCO, 20 subjects in each group. The main different treatment was on the VCO group, all the subjects received VCO 3 x 15 ml/day for six weeks but

not in the non-VCO group.

Population demographics data (age and sex), anthropometric measurement included height and weight to determine body mass index (BMI), assessment of nutritional intake with food recall 1 x 24 hours was used to establish daily energy and macronutrient intake and laboratory assessment (CD4+ count) was done on subjects. Statistical Analysis used independent t test for group difference if normal distribution otherwise the Mann-Whitney test.

In the VCO group, 57% subjects were between 18 and 29 years old and in the non-VCO group 71% subject were between 18 and 29 years old. 71% were woman in the VCO group and 64% were men in the non-VCO group (64%). 12 subjects (6 from each group) dropped out from the study due to various reasons. There was no significant difference on anthropometric measurement before and after treatment (table 1).

Nutritional assessment

There was no significant difference on energy intake before treatment ($p = 0,37$) on the contrary, there was significant difference on energy intake after treatment ($p = 0,007$) between VCO and non-VCO (figure 1). There were no significant difference on carbohydrate (figure 2) and protein intake (figure 3) not only before treatment but also after treatment. There was significant difference on fat intake after treatment ($p < 0,001$) between VCO and non-VCO (figure 4).

Energy intake Proportion

There was no significant difference on energy requirement ($p = 0,084$) between VCO and non-VCO. However there was significant difference on energy intake proportion (energy intake per energy requirement) ($p = 0,004$) between VCO and non-VCO (table 2).

CD4+ T Lymphocyte Count

There was no significant difference on CD4+ T lymphocyte count ($p = 0,37$) before treatment between VCO and non-VCO. However there was significant difference on CD4+ T lymphocyte count ($p = 0,047$) after treatment (figure 5).

Drop out of 30% subjects from this study resulted declining on research power from 80% to 60 – 70%. Most of the subjects (92%) in this study were drug or

Energy	VCO	Non-VCO (n=14)	p
Requirement (Cal/day)	2608,57 \pm 309,41	2820,71 \pm 321,74	0,084 ^m
Intake (Cal/day)	1459,35 \pm 327,37	1101,01 \pm 319,82	0,007 ^t
Energy Intake Proportion (%)	56,07 \pm 11,7	39,43 \pm 13,03	0,004 ^m

m = Mann-Whitney U test, t = Independent t test, Significant at $p < 0,05$

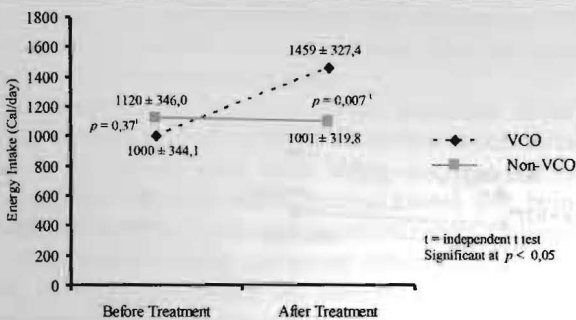


Figure 1. Energy intake before and after treatment between VCO and non-VCO.

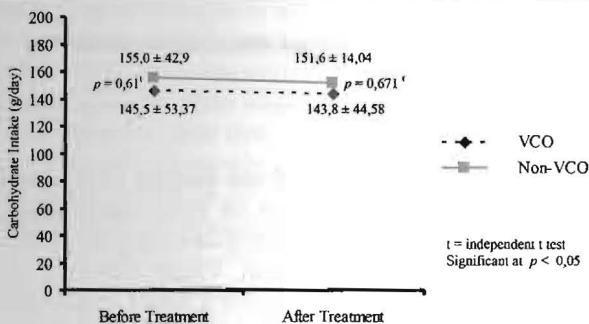


Figure 2. Carbohydrate intake before and after treatment between VCO and non-VCO.

narcotic users which made it difficult to obtain subject to follow the protocol.

92% subject had HIV from IDU. In developing country, HIV spread mostly through IDU. Badan Narkotika Nasional (BNN), 2004 conducted a study in ten big cities in Indonesia (Medan, Jakarta, Bandung, Semarang, Yogyakarta, Surabaya, Makasar, Denpasar, Manado, and Batam) found that 56% from 572 thousand ribu people are intravenous drug/narcotic users and 40% or 229 thousand are HIV positive. This data indicate that HIV cases has risen very highly during the past.

Body mass index was not significantly different between VCO and non-VCO before and after treatment. Short period of treatment and lower proportion of energy intake were the main reasons of this result. All the subjects had lower energy intake proportion and all of them had normal BMI. Possible reasons for this could be inaccuracy or bias in food recall interview. Secondly, reference for energy requirement from AKG (Angka Kebutuhan Gizi) or Indonesian RDA is not suitable for the subject. There were several study with the same result using AKG for energy requirement. If we calculate basal energy requirement with Harris-Benedict equation, the entire subject had 75% (minimum) fulfilled basal energy requirement. But there is no data to show that how long if someone had energy intake only for basal requirement have affected BMI. Studies show that BMI will decline if there is opportunistic infection on HIV subject.

CD4+ T lymphocyte count is used to indicate HIV disease progression, because HIV bind to this receptor in human body resulted in destruction and decline of CD4+ T lymphocyte count. The study show that there was significant difference on CD4+ T lymphocyte count between VCO and non-VCO. This result indicates that VCO supplementation had positive influence to CD4+ T lymphocyte. The same result was obtained by another study. One of the reasons for the positive influence of VCO supplementation on CD4+ T lymphocyte is the high content of lauric and capric acid in VCO. Lauric acid and capric acid are fatty acids with antiviral and bacterial capability. Fatty acids had toxic on viral cultivated and the more carbon chain on fatty acid made the more weaker toxicity characteristic. Thormar et al (1987) showed that lauric and capric acids

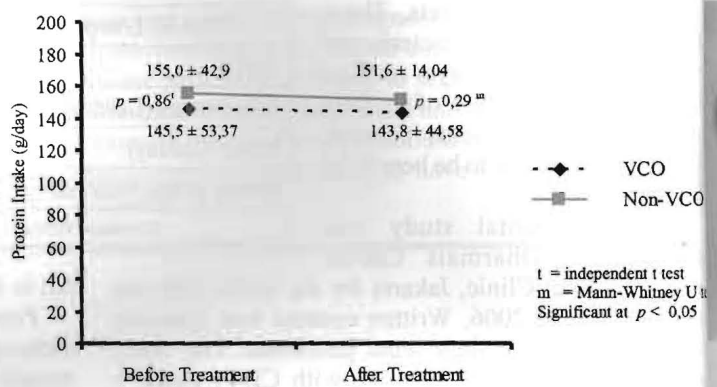


Figure 4.5. Protein intake before and after treatment between VCO and non-VCO.

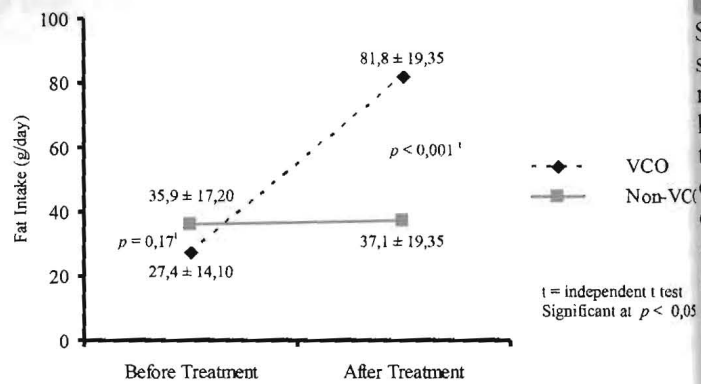


Figure 4.6. Fat intake before and after treatment between VCO and non-VCO.

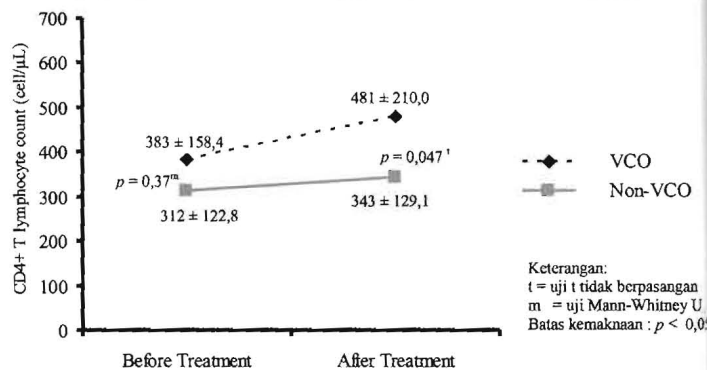


Figure 5. CD4+ T lymphocyte count before and after treatment between VCO and non-VCO.

have the antiviral ability and can destruct lipid capsule layer virus at ten times more on lower concentration compared to long chain fatty acid like oleat and linoleat. It can be concluded that Virgin Coconut Oil supplementation 3 x 15 ml/day for 6 weeks significantly increases CD4+ T Lymphocyte concentration in HIV patient. ■