

Letters

Snake Oil:

A Potent Source of Omega-3 EFA

To the Editor,

Snake has been a part of medical history since ancient times. It is not by accident that the Caduceus, logo of our profession, depicts a snake wrapped around the staff of Asklepios (Aesculapius). Galen's famous potion, Theriac, relied on snake as one of its ingredients and this was a mainstay in western medicine for almost 1000 years. Chinese medicine also found a place for snake and it remains in use to this day as an externally applied oil for arthritis and skin disorders. Snake oil, no less!

While I have seen no references to valid research studies of therapeutic benefits of snake oil, I am inclined to the prejudice that, since it has survived for many centuries in both western and Oriental medicine, it might actually have some therapeutic value. The fact that snake oil is referred to so regularly in labelling a false treatment as quackery may imply that it actually was popular enough, not too long ago, to threaten the medical orthodoxy, particularly in the late 19th Century in the United States, where the Chinese workers brought it and cowboy hucksters sold it.

In light of recent information about therapeutic benefits from fish oil, particularly its anti-inflammatory and anti-coagulant effects, it struck me as likely that snake oil, also derived from a cold-blooded animal, might contain similar essential fatty acids of the omega-3 type, such as eicosapentanoic acid (EPA) and docosa-hexanoic acid (DHA).

I purchased a bottle of snake oil in San Francisco at a Chinatown herbal store and sent it for chromatographic analysis to Monroe Medical Research Laboratory in Southfields, New York. The result: 19.6 percent EPA, a concentration even higher than that of cod liver oil, which like most ocean fish has about 12 percent EPA. This snake oil product was lacking in other omega-3 EFA, such as DHA and alpha-linolenic acid. It was also very low in omega-6 EFA, with only 2.5

percent arachidonic and 4.4 percent linoleic acids. The results are summarized in Figure 1 (below).

In order to verify the presence of omega-3 essential fatty acids in other snakes, I obtained two rattlesnakes, a red (*Crotalus tigris*) and a black (*Crotalus viridis*). These were donated by James Nyhan, proprietor of "The Creature Exchange" in San Francisco. I am indebted to Dr. George Miroff, Monroe Medical Research Laboratory, for analysis of subcutaneous dorsal fat (gas chromatography and flame ionization methods) in these snakes as well as the Chinese snake oil.

The rattlesnake results are about one third the concentration of omega-3 fatty acids compared to the Chinese product. The red snake's fat was 6.5 percent omega-3 and 32.8 percent omega-6 EFA. The black snake's fat was 5.6 percent omega-3 and 16.9 percent omega-6 EFA. The red snake contained 0.6 percent EPA and 5.4 percent DHA (docosa-hexanoic acid). The black snake contained 4.1 percent EPA and 0.1 percent DHA.

Figure 1.
Fatty acid fractions in snake oils
(percent concentration)

Source	Omega-3			DHA
	ALA	EPA		
Chinese	0.001	19.6		0.001
Black	1.4	4.1		0.1
Red	0.5	0.6		5.4
Source	Omega-6			ArA
	LA	GLA	DGLA	
Chinese	4.4	0.001	0.001	2.4
Black	9.7	0.71	2.8	4.7
Red	20.8	0.06	0.1	12.8

ALA = alpha linolenic acid; EPA = eicosapentanoic acid; DHA = docosa-hexanoic acid; LA = linolenic acid; GLA = gamma linolenic acid; DGLA = dihomogamma-linolenic acid; ArA = arachidonic acid.

While the amount of omega-3 EFA in these wild rattlesnakes is less than half

that of cod liver oil and less than a third that of imported Chinese snake oil medicine, it is nevertheless sufficient to benefit those whose diet is low in fish, soy, legumes, walnuts, chestnuts or flax seed or oil, which are the traditional sources of omega-3 EFA. The salad oils in common use nowadays, eg. corn, peanut, safflower, cottonseed and sunflower contain only about 0.5 percent omega-3 EFA. Soy oil, with 5 to 8 percent omega-3 EFA is comparable to the rattlesnake specimens.

The nutritional requirement of omega-3 EFA is estimated to be 1 to 2 percent of calories or about 3 grams daily. This amount is found in about 1 tsp. flax oil, 3 tsp. of cod liver oil, 3 tsp. of Chinese snake oil or 9 tsp. of rattlesnake oil. The presence of significant amounts of eicosapentanoic acid puts snake oil in the same class with fish oil as a therapeutic factor.

Conclusion

In the light of recent advances in our

understanding of essential fatty acids, snake oil gains new credibility. Certainly it deserves to be evaluated scientifically. We might begin by asking how it is that the Chinese product has triple the concentration of omega-3 essential fatty acids compared to two California rattlesnakes. Is it a species difference, a matter of climate or do they feed their snakes on fish while ours eat mice? Finally, I propose that it is time to rescue snake oil from those who would call it quackery. After all, it is a snake, not a fish, that adorns the staff of Asklepios.

References

1. Lee TH, Hoover RL, Williams JD, et al: Effect of Dietary Enrichment with Eicosapentanoic and Docosahexanoic Acids on in vitro Neutrophil and Monocyte Leukotriene Generation and Neutrophil Function. *N. Engl. J. Med.* 1985: 313, 1217-1224.

Richard A. Kunin, M.D. 2698 Pacific Avenue
San Francisco, CA 94115 (415) 346-2500