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Review

The Cosmeceuticals: A review

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Cosmeceuticals are the latest addition to the health industry and are described as cosmetic products with drug-like activities. The term cosmeceutical was coined by Kilgman but these lines of product became popular in 1996 and have an expanding market that has rapidly reached Africa. Many scientists and health consumers in Africa may not be conversant with this line of products. They may therefore, be under-researched or over-utilized. This paper is to briefly, expand the recent knowledge about cosmeceuticals.

Key words: Kilgman, cosmeceuticals, health industry.

INTRODUCTION

Cosmetics are products that are used to cleanse and beautify the skin (Millikan, 2001). The first recorded use of cosmetics is attributed to Egyptians in 4000 B.C (Rona et al., 2004). Pharmaceuticals are essentially drug products and are defined as products that prevent, mitigate, treat or cure disease and /or affect the structure or function of the body (Vermeer and Gilchrest, 1996). Cosmeceuticals is a deliberate portmanteau of these two terms and is intended to connote drug like benefits from an otherwise cosmetic product. Kilgman may be described as the father of Cosmeceuticals, a term he popularized (Kilgman, 2005), but they first appeared in the world market in 1996 (Draelos, 1997). The purported drugs-like effects are largely unproven and the term is neither recognized by the United State‟s food and drug administration nor by any other regulatory body. The scientific community has latched onto the flamboyant term. Between 1996 - 2007, over 837 articles have been published in reputable journals and over 600 have used the world cosmeceuticals as an authentic term (Mehta and Fitzpatrick, 2007). This may be the beginning of international recognition. Cosmeceuticals are generally presented as lotions or creams and are mostly targeted at dermatological issues (Choi and Berson, 2006). Recently, orally delivered products of similar claims as cosmeceuticals have been labeled as either oral cosmeceuticals or as nutricosmetics or nutriceuticals. Commonly, all these are simply called cosmeceuticals. Recently an alarming term called physician dispensed cosmeceuticals has been used in the United States

(Mehta and Fitzpatrick, 2007). What products, really, are cosmeceuticals?

LINES OF PRODUCTS

The lines of products of cosmeceuticals are designed both to exploit veterinary and human therapy. The main product lines of veterinary cosmeceuticals are shampoos and anti ectoparasites. MERA-PET (MP) lines of products are probably the most popular in Europe and North America. „Tickoff" is an MP veterinary cosmeceutical that is claimed to be an "herbal research product that is scien- tifically for killing actions against fleas, ticks and lice" (Mera-Pet, 2008). GLOSSOM pro-Vit (Mera-Pet, 2008) is claimed to be an excellent shampoo for treating furs. It contains protein, Vitamins E and A and is marketed as an enhancer of healthy and shiny body coat. The German company, Novoselect Gmbh, has pushed out an exten- sive list of cosmeceuticals for the veterinary sector that is targeted at germinal reduction and as supports of skin healing processes (Granato, 2000).

Beckett (2008) is another market leader in cosmeceu-ticals that has sought to enhance its sales by marketing so called „animal friendly" product lines. The rationale for veterinary cosme-ceuticals is sometimes based on good science. Whatever product is designed to be animal friendly is obviously good in today"s pet loving world. Most veterinary cosme-ceuticals contain a carbamate. For example, „Tickoff" contains 5% Carbaryl, a broad

spectrum carbamate insecticide which has documented activity against over 100 ectoparasites (Baron, 1991). The damage is that the major constituents include concoctions of *Azadirachta indica, Cedrus deodora, Cocos nucifera, Pongamia pinnata* and *Premna integrifolia* all with no stated evidence of ectoparasite activities (Mera-Pet, 2008).

The main product lines of human cosmeceuticals are anti-aging while very few are anti acne or moisturizers. Common brand names include “Bliss”, “MD Skin Care”, “La Roche”, Nu-Derm” and “SensiClear”. Almost all are the products of research and development (R and D) from basic sciences (Choi and Berson, 2006). As at 2005, the global market was estimated at $53billion (Thornfeldt, 2005). Anti-aging Cosmeceuticals control over 95% of these and has a double digit growth in most global markets (Thornfeldt, 2005).

Like veterinary cosmeceuticals, anti-aging cosmeceuticals have been formulated on sound biological grounds but with unsubstantiated clinical claims. Aging may be intrinsic or extrinsic. Restated, the score of the aging process at any time depends on the outcome of dynamic interactions between biological (intrinsic), psychological (intrinsic and extrinsic) and environmental factors (Lupo and Cole, 2007). The final pathway to all the mechanism of aging is apparently the same and involves disruption of the network of collagen and elastin (Rattan, 2007). Anti-aging cosmeceuticals are therefore designed to repair and/or maintain the body‟s maintenance and repair systems-so called MRSs.

These formed the grounds for products like cosmeceutical peptides which may contain neurotransmitters, signal peptides or carrier proteins. Up to 500 peptides have been characterized (Lupo and Cole, 2007) and are theorized to increase growth factor (Rattan, 2007). Botanical cosmeceuticals contain botanical ingredients with traditional or folk medicine usage. These often include grape seed extracts, Aloe Vera, mushrooms, olive oil, green tea, licorice, coffee Arabica and coffee berry extracts (Baumann, 2007). Antioxidants play a large role in the MRSs. This may explain incorporation of Vitamins C and E into cosmeceuticals sometimes called better cosmeceuticals (Burke, 2007). Better cosmeceuticals may also contain niacinamide and kinetin (Chiu et al., 2007).

EFFICACY OF COSMECEUTICALS

The term „cosmeceutical“ has been heavily criticized because it connotes that rigorous efficacy studies have been done as it would be for pharmaceuticals. Veterinary cosmeceuticals are virtually all sold as animal treats, probably to avoid rigorous requirements for proof of efficacy. Various studies on cosmeceutical peptides have not demonstrated clinically significant difference from placebo. Botanical cosmeceuticals are probably at similar level of development with oral herbal remedies. Extensive studies in animals have demonstrated effects like anti-inflammatory, anti-tumorigenic, anti-microbial, antiperoxidation and free radical scavenging activities in wide range of models using mouse, rats and guinea pigs (Thornfeldt, 2005). Most have neither undergone phase 2 or 3 clinical trials nor randomized studies and their efficacy remain unproven. The so called better cosme-ceuticals have fared worse on rigorous testing. Though, high concentrations of Vitamins C and E do indeed protect against acute ultraviolet skin damage, the low concentrations in most comseceuticals have not been shown to be effective(Farris, 2005). Furthermore, the stability of these vitamins is compromised as soon as the product is exposed to light and air (Glaser, 2004). Finally, they are often incorporated into cosmeceuticals as esters or mixtures of isomers that are neither absorbed nor metabolized by the skin (Thornfeldt**,** 2005). Generally cosmeceuticals that contains 15% Vitamin C probably have some effect on wrinkles (Farris, 2005). Such lines of products are called Skinceuticals probably to emphasize that traditional cosmeceuticals do not contain such a high amount of vitamins C.

THE TOXICITY OF COSMECEUTICALS

The term „natural“ is frequently used for most components of cosmeceuticals and willingly or unwillingly connotes safety. This is far from the truth. Carbaryl, the only constituent of veterinary cosmeceuticals with documented toxicity profile, has an oral LD50 of 100 mg/kg in mice and 250 mgkg in rats (Carpenter, 1961). Though, it is rapidly metabolized by human and animals and does not accumulate, low doses have been known to cause dermal and eye irritation in rabbits despite that the dermal LD50 in rabbits is quoted as greater than 2000 mg/kg (Haward, 1991).

Vitamin E has been shown to cause a significant increase in contact dermatitis (Burke, 2007) while the anti-oxidant P-hydroxyanisole increases skin pigmentation (Choi and Berson, 2006). Some component peptides have also been shown to be carcinogenic (Burke, 2007). Perhaps the greatest danger is from deliberate adulterations and incorporation of harmful products like steroids and retinoid. These can lead to devastating skin and systemic changes (Sorg et al., 2006). Microbial contaminants have been reported with unfavorable consequences (Choi and Berson, 2006).

CONCLUSION

Cosmeceuticals are not drugs but are claimed to have drug like effects. The claims are largely unsubstantiated and the term, though misleading, has probably come to stay. The term and the target consumers appear flamboyant enough to withstand government regulations.

In a free trade world, the benefits and adverse effects of cosmeceuticals are probably optimized by frequent review to inform the clinical and public stake holders of their uses and limitations.

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