Corneotherapy and anti-aging

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Corneotherapy was coined in the nineties by Professor A.M. Kligman. In his studies he proved that a skin therapy with moisturizers already could achieve clinical effects. Experience has shown now that corneotherapy can also protect the skin against premature aging.

Most important result of the Kligman studies is the finding that appropriate moisturizers and lipids will not only support the integrity of the horny layer but subsequently also further the regeneration of deeper skin layers. And, a recovery of the skin will also promote the protection against premature aging.

Modular systems

It is of course impossible to treat all the different types of skin with one single product only. Besides the precise analysis of the skin, a further significant precondition for corneotherapy is an individually adapted product respectively a modular system which can be individually adapted.
A well-targeted corneotherapy though focuses on specific base creams which can be individually adapted with particular skin care agents. The structure of the skin barrier served as model for the base creams with membrane structure. Just like the skin, they are able to absorb lipophilic and hydrophilic substances at room temperature. Liposomes and nanoparticles which are also part of the "membrane family" are additional active agent carriers. The natural phosphatidylcholine they contain may release linoleic acid in the skin and hence serves as a substrate for the synthesis of the barrier active ceramide I which can be found in the stratum corneum. Besides, linoleic acid is an effective agent for the therapy of 1st and 2nd grade acne vulgaris which among others are caused by a cornification disorder at the exits of the sebaceous glands.

Cell aging

Furthermore, phosphatidylcholine is responsible for the transformation of ceramides into sphingomyelins in live cells. An increase of ceramides there is an indication for cell aging. This might also be the reason for an improved skin structure, which in practice can be observed after the long-term application of phosphatidylcholine. A further interesting fact is that the fluidity of skin barrier layers can shortly be increased with the linoleic acid containing phosphatidylcholine. This specific feature is the reason for an increased penetration of liposomal encapsulated actives. On the other hand the fluidity of the skin barrier can be reduced by applying a base cream with membrane structure. Thus, the skin barrier can be specifically adapted to either passing (transport) or a barrier (skin protection) function.

Physiological cream bases

Emulsifier free cream bases prove to be of advantage for the corneotherapeutic treatment since emulsifiers impair the integrity of the natural barrier layers. Recommended are substances which are compatible with the physiology of the skin. Hence, mineral oil components like petrolatum and paraffin oil are not appropriate either.
Base creams for corneotherapeutic purposes rather contain triglycerides which are closely related to the lipids in the stratum corneum. A further important barrier component is cholesterol whereas the animal based substance can be replaced with vegetable shea butter. Shea butter provides a high percentage of *sterol*s of vegetable origin, the so called phyto*sterol*s whose structure is closely related to chole*sterol*.

Vitamins

A multitude of active agents is available for the individual adaptation of corneotherapeutics. Retinyl acetate (INCI) which is converted into free vitamin A in the deeper layers of the skin should be mentioned here to give an example. Together with retinoic acid which develops, vitamin A accelerates the cell renewal process which exactly is the objective in cases of bad skin and skin susceptible to acne. In combination with the vitamins C and E, the agent is also successfully used for the treatment of aging skin. Vitamin E acts as a scavenger for

free radicals and while doing so it forms a radical which reacts with vitamin C and subsequently is re-converted into vitamin E. D-panthenol may be an excellent supplement for the care of inflamed skin. In this connection, also vitamin K should be mentioned which is very helpful in cases of reddened skin and hence in the institute is used to calm the skin. Vitamin K, above all, is applied for the treatment of couperosis and rosacea skin. And, just for the opposite effect, green tea is used to stimulate the micro circulation in the skin which is a desired effect especially for the aging skin.

Atrophic skin

Combinations with coenzyme Q10 may be helpful for the atrophic skin. Coenzyme Q10 plays a key role in the respiratory chain. The Coenzyme Q10 level in elder people decreases which means that particularly the lipid metabolism will decline during the aging process. Coenzyme Q10 is a fat soluble molecule whose structure is closely related to the vitamins E and K structure. It can be found in the membranes of the mitochondriae which may be seen as the cells' power plants. Main component of these membranes also is phosphatidylcholine. Topically applied coenzyme Q10 may have positive effects on inflammatory processes and also activates the metabolism. It is most effective when transported into the skin together with nanoparticles and phosphatidylcholine.

Vegetable extracts

Very interesting are extracts of echinacea which is used in cases of couperosis and for sun-burnt skin, and of algae with their moisturizing and antimicrobial spectrum. Because of its astringent effect, hamamelis is applied on cracked and chapped skin. Based on vegetable extracts are also whitening concentrates used for pigment disorders with typical tyrosinase inhibiting components. They can be perfectly combined with liposomal encapsulated vitamin C which also has whitening effects.
Active agent concentrates are generally applied on the cleansed skin possibly even after a pre-treatment with aqueous D-panthenol preparations or empty liposomes which improve the penetrability of the skin.

Skin hydration

Phosphatidylcholine is not only used in base creams, liposomes or nanoparticles but also in specific oleogels. Oleogels practically are water free and preferred, when specifically high lipid content is required for corneotherapy. This however is only indicated in some rare cases where aqueous solutions are not tolerated or in cases of extremely dehydrated skin. An interesting field of application also is pedicure as they noticeably soften cornifications.
A precise diagnosis of the skin and the individual skin condition are the deciding factors when selecting the most appropriate product type. Members of the "membrane family" and oleogels for instance show completely different characteristics regarding the skin hydration process. This can also be observed for surface lipids of the skin and the transepidermal water loss (TEWL).
In order to sizably improve skin hydration physiological moisturizers like glycerin, urea, amino acids and salts are used. With the help of measuring devices, their efficacy can easily be proved. Main field of application is the aging skin which is susceptible to lipid deficiencies and dehydration. Among others also a clinically relevant improvement of the skin condition can be observed for atopic skin.

Skin smoothing

Natural oils may also influence the skin hydration balance. Raw skin becomes soft and smooth and the capability to cope with mechanical impacts will be increased. An excellent oil e.g. is avocado oil. Skin smoothing can also be achieved with the application of natural mucins as e.g. aloe extracts. Mucins retain water and coat the skin with a permeable moisture film. Similar film coatings may be achieved with hyaluronic acid, glucan and cellulose compounds. Due to their specific chemical composition hyaluronic acid and glucans combine with the proteins of the skin and their characteristic film is less noticeable compared to that of cellulose compounds. Similar to protein products the surface films lead to a light tightening of the skin after drying.

Preventive corneotherapy

Appropriately formulated corneotherapeutic preparations help to prevent premature aging of the skin. A further issue is to absolutely avoid a long term damage of the skin as e.g. caused by insufficient UV protection, persistent influence of apparently non-toxic substances and irritations due to repeated peelings. Significant corneotherapeutic elements above all are base creams and active agents which are related to the physiology of the skin.

Dr. Hans Lautenschläger