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UNIT V: COSMETIC PROBLEMS ASSOCIATED WITH SKIN AND HAIR

COSMETIC PROBLEMS ASSOCIATED WITH SKIN AND HAIR

5.1. INTRODUCTION

Skin is the number one target for most cosmetics and personal care products. Consumers apply products to their skin to cleanse, protect, moisturize, peel, or cover it. Cosmetics are not intended to change the structure of the skin. However, OTC drug-cosmetic products and prescription-only drugs and even some cosmeceutical products alter the structure of the skin. Therefore, understanding the structure and function of the skin is essential (Unit 1). Human skin can be categorized based on gender, its color, UV sensitivity, vulnerability,

oiliness, healthiness, and special need among others. Amongst these, Skin Types Based on Hydration State and Lipid Content is discussed here.

5.2. SKIN TYPES BASED ON HYDRATION STATE AND LIPID CONTENT

It is essential to keep the skin hydrated in order to maintain the integrity of the skin barrier and prevent loss of water as well as penetration of physical and chemical substances. Scientists differentiate among oily, dry, combination, and normal skin. These types have different characteristic features. It should be emphasized that the skin type of an individual is not constant; it may change over time depending on several internal factors, such as hydration state, lipid content, pH, moisture binding capacity, as well as some external factors, such as UV light, wind, temperature, and humidity content. This classification is often used when selecting cosmetics, such as cleansers and moisturizers.

5.2.1 NORMAL SKIN

It has no exact definition, it is usually compared to other skin types as a reference. It is generally described as not too oily and not too dry. At a cosmetological level, normal skin is structurally and functionally balanced, and it has fine pores; it is smooth and well supplied with blood. In addition, it has no or only a few imperfections, no severe sensitivity, and a radiant complexion.

5.2.2 DRY SKIN

Dry skin is a very common skin condition characterized by a lack of the appropriate amount of water in the most superficial layer of the skin, epidermis. It can be characterized as scaly, rough, and dull, which can lead to tautness and itchiness. In addition, it generally has red patches and can be characterized with less elasticity and a rough complexion. Dry skin tends more toward premature aging and is likely to have more wrinkles. While dry skin tends to affect males and females equally, older individuals are typically much more prone to dry skin. The skin in elderly individuals tends to have diminished amounts of natural skin oils and lubricants. Areas such as the arms, hands, and particularly lower legs tend to be more affected by dry skin. Environmental factors, such as humidity and temperature, have a profound effect on the amount of water retained within the skin. For example, cold, dry air when heated by a furnace will produce dry skin by evaporating moisture on the skin. Frequent hand washing and sanitizing causes evaporation and dryness. Dry skin may also be a side effect of some medications as well as a byproduct of certain skin diseases.

The epidermis is normally composed of fat (lipid) and protein. The lipid portion of the epidermis along with specific epidermal proteins (for example, filaggrin) helps prevent skin dehydration. When there deficient proteins and/or lipids the skin moisture evaporates more easily. As skin becomes dry, it also may become more sensitive and prone to rashes and skin breakdown The medical term for dry skin is xerosis Simple prevention and treatment measures are very effective in the treatment of dry skin. Basic dry skin prevention steps include avoidance of harsh soaps and chemical cleansers. Treatment generally requires more frequent and regular applications of bland emollients and moisturizers. Untreated, dry skin may result in complications, including, eczematous dermatitis, secondary bacterial infections, cellulitis, and skin discoloration. Fortunately, dry skin is usually mild and can be easily remedied.

SIGNS AND SYMPTOMS OF DRY SKIN

The signs (what we see) and symptoms (what we feel) of dry skin are:

- Rough, scaly, or flaking skin
- Itching
- Gray, ashy skin in people with dark sski
- Cracks in the skin, which may bleed if ssever
- Chapped or cracked lips
- When dry skin cracks, germs can get in through the skin. Once inside, germs can cause an infection. Red, sore spots on the skin may be an early sign of an infection.

CAUSES OF DRY SKIN

Dry skin (xerosis) often has an environmental cause. Certain diseases also can significantly affect skin. **Potential causes of dry skin include:**

Weather: Skin tends to be driest in winter, when temperatures and humidity levels plummet. But the season may not as much if live in desert regions,

Heat: Central heating, wood-burning stoves, space heaters and fireplaces all reduce humidity and dry the skin. Hot baths and showers: Taking long, hot showers or baths can dry the skin: So can Frequent swimming particularly in heavily chlorinated pools. Harsh soaps and detergents. Many popular soaps, detergents and shampoos strip moisture from skin as they are formulated to remove oil.

Other skin conditions: People with skin conditions such as atopic dermatitis (Eczema) or psoriasis are prone to dry skin prevention

Try these tips to keep skin from getting excessively dry:

Moisturize: Moisturizer seals skin to keep water from escaping Limit water exposure: Keep bath and shower time to 10 minutes or less. Turn the dial to warm, not hot. Try to bathe no more than once a day. skip the drying soap: Try cleansing creams, gentle skin cleansers and shower gels with added moisturizers.

Cover as much skin as possible in cold weather: Winter can be especially drying to skin, so be sure to wear a scarf, hat and gloves when go to the outside

Wear rubber gloves: By wearing gloves, skin can be protect from water or harsh

cleansers

Treatment

Moisturizer. Applying a moisturizer frequently throughout the day can help. It can make the skin softer, smoother, and less likely to crack. Body moisturizers come in a few forms: ointments, creams, lotions, and oils.

For very dry skin, a moisturizer that contains urea or lactic acid may be helpful. These ingredients help the skin hold water. A drawback is that these ingredients can sting if have eczema or cracked skin.

- **Medicine:** When skin is extremely dry, a corticosteroid (cortisone-like) or an immune modulator (tacrolimus, pimecrolimus) is used. These medicines tend to be quite good at relieving the itch, redness, and swelling. Also need to use a moisturizer several times a day.

Changes to routine day: If dry skin is caused by something, such as immersing hands in water all day, may need to stop doing this for a few days. When start up again, then may need to wear gloves or apply a special moisturizer throughout the day.

5.2.3 OILY SKIN

has enlarged pores; therefore, it is very shiny as a result of over activity of the sebaceous glands. Oiliness is most visible on the forehead, nose, and chin, and these parts are oily to the touch. Oily skin can appear shiny and heavily textured. The excessive amount of shine and feeling of oil on face can be notice by midday. In addition to this, a greasy feeling, enlarged pores, breakouts, and other blemishes often accompany oily skin.

Oily skin usually develops with the onset of puberty and affects a large percentage of young people. There are several factors that can cause and/or contribute to oily or greasy skin, including genetic inheritance, hormonal changes, diet, stress, and external agents (such as cosmetics, chemicals, UV light). Individuals with this skin type often tend to suffer from acne and dandruff as adolescents.

SYMPTOMS OF OILY SKIN

Oily skin happens when body produces more natural oil than needed. Symptoms of oily skin appear mainly along the "T-zone" area of face and include: Oily skin is marked by large pores and a shiny, thicker feeling complexion.

It produces more than enough oil so hydration isn't the issue, but blackheads and pimples usually are

The extra oil that body produces cannot only feel and appear uncomfortable, but can also lead to breakouts or acne.

People with oily skin struggle with keeping shine down during the day, and usually feel the need to wash their face often.

CAUSES OF OILY SKIN

1. Heredity

Oily skin tends to run in families. It likely to have overactive sebaceous glands too, if parents have oily skin,

2. Age

If don't necessarily grow out of oily skin, then skin will indeed produce less sebum as age pass. Aging skin loses protein, such as collagen, and the sebaceous glands slow down. This is why many people who have aging skin also have dry skin. This is also the time when fine lines and wrinkles are more noticeable because of the lack of collagen and sebum. Even people in their 30s may not have the same skin composition as they did in their teens and 20s. An aesthetician can help evaluate skin type every few years to see if need to make any changes to skin care routine.

3. Diet

Consuming excess salt lead to an increase in oil levels as the skin tries to combat the dehydration caused by salt. Limit salt intake by steering clear of processed foods that often contain high levels of salt, and avoid adding extra salt to food. "Red meat (such as sausages, beef, lamb and bacon) can be high in saturated fats, which can increase inflammation in the skin. This excess inflammation can cause excess oil to be produced,

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Research has shown foods high in sugar increase the production of IGF-1, a peptide hormone that stimulates growth but can also cause an overproduction of sebum, aka excess oil," "Foods high in refined carbohydrates (aka white bread, white pasta, white rice) can also increase the production of IGF-1, which can cause an overproduction of sebum," An easy change to make is to switch white refined grains to the less refined varieties (eg., brown pasta and brown rice).

4.Hormone levels

Many of the skin changes may experience around puberty and later in life are due to small glands called sebaceous glands. Sebaceous glands, like many other parts of the skin, have receptors which are influenced by sex hormones. These glands are affected most dramatically by androgens, which are male sex hormones like testosterone, but are present in both sexes. These androgens increase the production of sebum during puberty in both sexes. When there are more androgens binding to the receptors on the sebaceous glands, more sebum is produced. This can lead to noticeably oilier skin, and may progress to acne. Sebum production may change throughout the menstrual cycle. The impact that estrogen has on sebum production is still unclear. Estrogen has been demonstrated to suppress levels of sebum production and gland activation, particularly at high doses

5. Pregnancy

Oily skin during pregnancy is a pretty common phenomenon. Even women who normally have dry skin sometimes end up with greasy skin during their pregnancy period. Skin changes during pregnancy are common. Simply put: hormones. The body experiences a spike in the hormone progesterone, which can lead to an increase in the sebum production in hair and skin. Increased sebum production can then lead to oily skin during early pregnancy. Curiously enough, some women who normally have oily skin experience drier and clearer skin during their pregnancy.

6. Birth control pills

For women, fertility is dependent on a fluctuation of hormones, so a steady level of

hormones induced by combination contraception pauses fertility, but the consistent estrogen component can stabilize and suppress negative changes that affect skin such as blemishes, unwanted facial hair, and enlarged pores. Estrogen can sometimes increase melanin, so some women may notice increased areas of pigmentation known as melasma. Hormone birth control methods that don't contain estrogens, such as progestin-containing IUDs, or the progestin subdermal implant have little measurable effect on the skin.

7. Cosmetics use

Oil-based products can work wonders for dry and normal skin types but can prove disastrous for oily skin. Instead, choose products marked 'oil-free', 'non-comedogenic', or 'non-acnegenic'. Mineral oil is highly irritating and clogging to oily skin, so steer clear of even small doses. Moisturizer with highly emollient ingredients such as shea butter can severely clog pores, triggering more oil and massive breakouts. Stick to oil-free, non-comedogenic moisturizers. Petrolatum, or petroleum jelly, has earned the derision of natural beauty devotees because of concerns about how it might affect the skin and body. The debate rages on, but many people with dry skin find that the moisture-sealing property of petrolatum is a godsend. That's not the case for those with oily skin. Occlusive petrolatum can clog pores and contribute to even more oil production, so leave it for people with dry skin.

8. Humidity and hot weather

Sebum oil produced by the skin naturally protects and moisturizes it. Sebum can be worst enemy or best friend, depending on skin type. If there is a humid climate, skin produces much more of it in hot weather. This wouldn't be a problem, except that too much oil in skin causes clogged pores and leads to acne and other skin problems. Since heat tends to dry out the skin and trigger excess sebum production.

5.2.4. COMBINATION SKIN

Combination skin, as its name implies, is the combination of normal and oily skin, or of oily and dry skin. This type of skin has a tendency to be greasy in the central T-zone of the forehead, nose, and chin. The skin on the other areas (cheeks and hairline) is normal or dry. Although it sounds like an oxymoron, it's possible to have skin that's simultaneously dry and oily. Dermatologists may label skin with this condition as "combination skin." Dry and oily skin often occurs in people who are chronically dehydrated. But the primary cause behind dry, oily skin is simply genetics. Combination skin means that have fine lines and wrinkles at the same time as acne, blackheads, and other oil-related breakout issues.

SYMPTOMS OF DRY, OILY SKIN (COMBINATION SKIN)

Before taking steps to treat combination skin, it's important to know whether the actually do have it. Here are some signs of combination skin.

See a dermatologist to confirm the diagnosis:

Oily T-zone: Noses, chins, and across the forehead are oily or look shiny. This area is known as the T-zone.

Large pores: can easily see pores in the mirror, especially the ones on forehead, nose and the sides of nose.

Dry spots: Cheeks and the skin under eyes are often dry (and sometimes flaky) If not sure whether the above symptoms apply to you, do a simple test: 1. Wash face thoroughly with a gentle soap or cleanser. Blot skin dry with a towel, and then wait for 20 minutes.

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A Don't touches face during this time or put anything on face (such as moisturizer) After 20 minutes have passed, look at skin in the mirror. If T-zone is oily but the rest of face feels tight, then probably have combination skin.

TREATMENT OF DRY, OILY SKIN

Although genetics is the leading factor in skin type, there are ways that can combat the problems associated with dry, oily skin. Here are a few of the most popular treatments:

Nutrition: Many times, people with dry, oily skin get breakouts from moisturizers or lotions. However, it's still important to moisturize skin. By incorporating healthy oils into diet or taking fatty acid supplements, such as fish oil with docosahexaenoic acid (DHA) and eicosa pentaenoic acid (EPA) and plant sources with alpha-linolenic acid (ALA).

Oil-free sunscreen: Always use a sunscreen whenever we are outside. This proves difficult for many people with dry, oily skin, though, because they fear sunscreen will cause breakouts. Oil-free formulas are a safe bet. They're commonly labeled as "mineral sunscreen."

Sensitive skin is a complex dermatological condition, defined by abnormal sensory symptoms, for example, tingling, chafing, burning, or prickling, and possibly pain or pruritus by various chemicals (eg, cosmetics, soaps, water, pollution), physical factors (eg UV light, heat, cold and wind), microorganisms, psychological factors (e.g., stress), and hormones (e.g., menstrual cycles). It is often thought to be a specific skin type, similar to oily or dry skin. However, it is more of a condition since normal, oily, dry, and combination skin can also be sensitive to various irritants. The term "sensitive skin" mainly refers to facial skin, but it can also concern other body areas, such as hands, scalp, or genital area. It is a very common condition in the US, affecting a larger percentage of women. Its pathophysiology includes the alteration of the skin barrier, allowing potential irritants and microorganisms to penetrate the skin and generate an inflammatory reaction.

5.3. SKIN MOISTURISATION

Wrinkles form on the face well before the rest of the body and serve as an indicator of age and lifestyle. The relative color and luminosity of the facial skin represents overall health and emotional state. Facial skin can be dull to vibrant representing poor to excellent physical health. The face mirrors acute changes in well-being. For example, persons experiencing cardiac distress appear ashen while anger or embarrassment may be expressed as a reddened face. Thus, the face represents the current physical state of the individual. Moisturizers can enhance the appearance of the face and are thus important cosmeceuticals.

The incidence of cutaneous melanoma as measured by relative tumor density is highest on the face in subjects over the age of 50 years, a statistic that is interpreted as directly correlating to the amount of long-term UV exposure. This means that facial photo protection is of great importance, thus the incorporation of efficacious UVA and UVB protection in daily facial moisturizers is worthwhile. The hands and feet are prone to dryness and impaired barrier function because of their unique functional roles, predisposing the skin to heightened irritant sensitivity and the development of dermatoses. Protective and regenerative moisturizing skin care is the foundation for averting and treating dry skin associated skin diseases and disorders.

The face is a major point of contact for sensory input the facial skin possesses high innervation and is therefore more sensitive than skin elsewhere on the body. The skin covering the face also has to allow for the subtleties of facial expressions and phonations. Dry skin is a term used to describe the condition that arises when the normal functioning of the skin is compromised. If the water content of the SC drops below 20% for an extended period of time, the enzymes involved in desquamation will be unable to function and the process of orderly epidermis cycling will be compromised. This is especially apparent in dry facial skin.

Skin of the hands and feet is different from other body sites. In particular, skin on the palms and soles is thicker, and has a high density of eccrine sweat-glands; however, it lacks apocrine glands. Repetitive use of the hands and feet accompanied by pressure and friction can promote the formation of areas of thickened keratinized skin or calluses, which can crack and fissure. Hand skin is particularly susceptible to xerosis and dermatitis. Constant use of the hands, frequent washing and environmental, chemical, and irritant exposure can provoke these problems. Further, because the hands are especially prone to injury and exposed to irritants and pathogens, specific protectant skincare formulations can be highly beneficial to prevent irritation or occupational dermatoses such as hand eczema.

While the feet may be less likely to suffer from deleterious occupational exposures, environmental factors can have an impact on the moisture status of the foot skin. Cold, dry weather in winter, bare feet in summer, and the confinement of shoes can compromise the hydration state. Occlusive shoes and socks can also trap moisture and render the foot susceptible to microbial infections, especially from fungus, damaging the barrier function and dehydrating the skin. In addition, certain metabolic diseases can impact circulation and innervation of the extremities, which in turn affects skin hydration. In particular, reduced circulation and eccrine sweat gland activity in diabetics cause severe xerosis which can spiral into other severe foot problems.

5.3.1 FACIAL MOISTURIZATION

The physiologic goal of facial moisturization is to restore the elasticity and flexibility of the SC, thereby restoring its barrier function. Kligman and Leyden defined a moisturizer

as a topically applied substance or product that overcomes the signs and symptoms of dry skin. The esthetic goal of moisturization is achieving soft, supple, glowing, healthy looking skin, as subjectively evaluated by the end - user. Regular use of facial moisturizer mitigates and prevents signs of aging especially when formulated with broad - spectrum sun protection for daytime use.

A properly formulated moisturizer can supplement the function of the endogenous epidermal lipids and restore the epidermal barrier function. This allows the skin to continue natural process of renewal and desquamation at a normal rate. The substances utilized by all moisturizers to achieve this desired effect are Humectants, such as glycerin, attract and hold moisture, facilitating hydration. Emollients, typically lipids or oils, enhance the flexibility and smoothness of the skin and provide a secondary soothing effect to the skin and mucous membranes. Occlusives create a hydrophobic barrier to reduce water loss from the skin. Emulsifiers work to bring together immiscible substances, they are a critical element in the oil and water mixtures employed in moisturizer formulas. Preservatives prevent the premature breakdown of components and inhibit microbiologic growth. Fragrances not only add to the esthetic value but can also mask the odor of formulation ingredients.

5.3.2 FACIAL MOISTURIZER FORMULATION

Facial moisturizers are typically oil in water emulsions. The water improves skin feel and offers an acceptable, universally tolerated base for the active ingredients. The water or oil solubility of components is inconsequential because both are present. Emulsions allow for a wide range of properties, such as slow to fast absorption rates depending on the final viscosity of the formulation. The fine-tuning of these properties is important for achieving the high esthetic expectations of a facial moisturizer. For example, a daily - use formula with high emollient content may feel heavy in a cream but be acceptable in liquid form. Conversely, overnight creams with antiaging additives may be thick in order to remain on the face during sleep and to slow the absorption of active components. Therefore, by utilizing a range of water to oil ratios, and varying humectant and emollient mixtures, the desired effects can be formulated within the acceptable esthetic parameters for a facial moisturizer

1. Humectants

The overall hydration level of the stratum corneum (SC) affects its mechanical properties. Humectants are key substances to maintain skin hydration. Natural humectants, such as hyaluronic acid, are found in the dermis, but external humectants can be externally applied in moisturizers. Humectants draw water from the viable epidermis and dermis, but can draw water from the environment if the ambient humidity is over 80%.

Humectants are water - soluble organic compounds that can sequester large numbers of water molecules. Glycerin, sorbitol, urea, and sodium lactate are all examples of external applied humectants.

Glycerin, also referred to as glycerol, is one of the most widely utilized compounds in cosmetic formulations. Its chemical structure brings together the stability of three carbon atoms with three water-seeking oxygen atoms in an anisotropic molecule, which is perfectly designed for use in skin and hair moisturizers. Glycerin constructs different physical forms that cover the spectrum

from sticks to microemulsions to free flowing creams that maintain stability over time. Glycerin can restore the suppleness of skin without increasing its water content, a trait that is exploited by its use in the cryopreservation of skin, tissue, and red blood cells, where water would freeze and damage them. Glycerin enhances the cohesiveness of the intercellular lipids when delivered from high glycerin therapeutic formulations, thereby retaining their presence and function

2. Occlusives

In order to maintain epidermal water content and preserve the barrier function of the SC, occlusive agents are employed in a role meant to complement the water - attracting nature of humectants. Occlusive agents inhibit evaporative water loss by forming a hydrophobic barrier over the SC and its interstitial areas. Occlusion is successful in the treatment of dry skin because the movement of water from the lower dermis to the outer dermis is a guaranteed source of physiologically available water. Petrolatum and lanolin are two historically popular occlusives that are slowly being replaced by more sophisticated alternatives. Petrolatum is a highly effective occlusive, but it suffers from an unfavorable esthetic. Lanolin is not recommended for use in facial formulations because of its odor and potential allergenicity

3. Emollients

Emollients are agents, usually lipids and oils, designed to soften and smooth the skin. Lipids

are non - polar molecules and as such they repel polarized water molecules, thereby limiting the passage of water to the environment. The most prevalent lipids in the SC, especially within the extracellular membranes, are ceramides. They comprise about 40% of the lipid content of the SC, the remainder of which is 25% cholesterol, 10 - 15% free fatty acids, and smaller quantities of triglycerides, stearyl esters, and cholesterol sulfate. These lipids are synthesized throughout the epidermis, packaged in lamellar granules, and eventually differentiate into multilamellar sheets that form the ceramide rich SC water barrier. The purpose of an emollient is to replace the absent natural skin lipids in the space between the corneocytes in the SC. Additional benefits include the smoothing of roughened skin thereby changing the skin's appearance, and providing occlusion to attenuate transepidermal water loss (TEWL) and enhance moisturization.

4. Fragrance

Fragrance is a component of facial moisturizers that is often dismissed as an unnecessary potential irritant, but this idea is becoming increasingly antiquated as the science supporting its proper use and evaluation is improved. Vigorous protocols have been developed that comprehensively and conclusively assess the tolerance of formulations on human subjects. Fragrances are screened separately first and then together in both normal and sensitive populations, and utilized at the minimum concentration required to mask the smell of certain components, if necessary. Fragrance improves the overall esthetic qualities of the moisturizer, which is an important component of any moisturizer formulation, especially one that is applied to the face.

5 Preservatives

Preservatives are also subject the same rigorous testing protocols as fragrances. The preservative must be strong enough to completely inhibit bacterial growth, but must not be sensitizing or irritating. Preservatives are an important component in facial moisturizers to

prevent the lipids in the formulation from becoming rancid. All facial moisturizers have some type of preservative, because there is really no such thing as a preservative - free formulation

6. Photoprotection and facial moisturizers

Sunscreens could be considered to be the most globally effective ingredient added to a facial moisturizer. Because the incidence and mortality rates of skin cancer have been steadily rising in the USA, the use of sunscreen as a daily protectant has become more important to consumers. There are both immediate and long - term benefits from photoprotection. The immediate benefit is the prevention of painful sunburn while long photoprotection results in reduced photodamage manifesting as wrinkling, inflammation, and dryness

A key immediate event that leads to chronic photoaging is the production of proteases in response to UV irradiation at doses well below those that cause skin reddening. Matrix metalloproteinases (MMPs), for example, are zinc dependent endopeptidases expressed in many different cell types and are critical for normal biologic processes. They may also be involved in desquamation processes, and overexpression would lead to early sloughing and increase in TEWL. With a proper sunscreen regimen, production of MMPs is minimized and their participation in chronic photoaging can be avoided. The addition of sunscreens to facial moisturizers also contributes to the prevention of reactive oxygen species (ROS) production, Langerhans cell depletion, and sensitivity to UV radiation, as is observed in polymorphous light. A number of commercially available hand and foot moisturizers incorporate combinations of both humectants and occlusive materials to deliver the optimal skin benefits (Table 5.1)

5.4. COMEDOGENIC

In the 1970s the cosmetic industry received adverse publicity which suggested that certain materials used in cosmetic products could cause and aggravate acne, particularly in adult women. These materials were described as being 'comedogenic'. Various companies capitalized on these findings by labeling their products as 'non-comedogenic'. After further research, however, it was found that the condition found both in adult women and in adolescents is acne vulgaris which can develop by several different mechanisms.

A frenzy of research produced a long list of such comedogenic ingredients,

- Isopropyl myristate
- Isopropyl palmitate
- Octyl palmitate
- Myristyl myristate
- Oleic acid

- Cocoa butter
- Coconut oil
- Butyl stearate
- Isopropyl isostearate Grapeseed oil
- Octyl dodecanol
- Oleyl alcohol
- Lanolin
- Isostearic acid

Comedone formation occurs when the pattern of keratinization inside the sebaceous follicle changes. Within the keratinocytes, these changes include the production of different keratins and a reduction in the number of lamellar granules. There is also an increase in mitotic activity. As a result the keratinocytes do not desquamate properly and the follicular duct is blocked. It is not known what causes these changes, but the result is a microcomedone. As further keratinized material accumulates, the follicle becomes visible from the surface as a closed comedone, or whitehead (Fig. As more material accumulates, the follicles distend and open comedones, also known as blackheads are formed. The black color is attributable to the oxidation of lipids as they reach the skin's surface. The test methods to assess comedogenesis are designed to quantify the hyperkeratotic plugs.

In addition, it was realized that a lot of exaggerated claims were being made the term comedogenic has been superseded by the more accurate description 'acnegenic'. Acnegenic covers the potential of a material to cause and aggravate both comedones and pimples. Although the list of acnegenic materials helps reduce the risk of formulating a product which may cause acne-related problems, it is still advisable to test the finished product.

More often than not, individual materials which may have acnegenic properties produce finished product which is non-acnegenic of course, the converse can also be true.

5.4.1. THE COMEDOGENIC SCALE FOR OILS AND BUTTERS

With more natural oils and butters available than ever before, it can be difficult to know which ones will work with skin. One way to navigate the spectrum of products and identify the ones

ideal for skin type is by learning about the components within the oils and how they differ. Fortunately, there's a cheat sheet called the comedogenic scale, which ranks oil and butters based on their propensity to clog skin pores. Since carrier oils and plant butters are the key ingredients in many cosmetic products, it's very helpful to know what effect they are likely to have

Comedogenic Scale

The comedogenic scale is ranked by how likely it is that any specific ingredients, such as oils and butters used in cosmetic product formulation, will clog pores. Anyone who is susceptible to acne breakouts and blackheads should avoid highly comedogenic oils, as they are likely to cause recurring acne problems. However, people with drier skin might prefer more emollient oil toward the middle of the scale.

The scale uses a numbering system of 0 to 5. Here's how the numbers rank on the scale

- 0 - Won't clog pores at all
- 1 - Very low likelihood of clogging pores
- 2 - Moderately low likelihood
- 3 - Moderate likelihood
- 4 - Fairly high likelihood
- 5 - High likelihood of clogging pores

Non-comedogenic oils are oils that do not clog pores and have a comedogenic rating of 2 or less. And just about any oil with a rating of 5 pretty much guarantees that a person who is prone to acne breakouts will have one

But so many factors are involved in how particular oil impacts skin that there is no way to make an "absolute" prediction. The fact is, everyone's skin is different, so oil will impact different people in different ways. For example, avocado oil can be a nourishing oil for some people with oily skin while others who also have oily skin will use it and develop more acne breakouts.

Factors that can lead to this variety of results may include things like skin type, illness, water intake, environmental factors, and other things that can influence the way the oils act on skin. In addition to an ingredient's comedogenic ranking, the composition of fatty acids is also useful in determining which skin type will benefit from a particular oil.

5.5. DERMATITIS

One of the skin's primary physiological functions is to act as the body's first line of defense against exogenous agents. However, the skin should not be viewed as a flawless physicochemical barrier. Many low-molecular weight compounds are capable of penetrating this barrier. When toxic agents (such as irritants or allergens in cosmetic products) permeate it, the resulting adverse effects may cause considerable discomfort to the consumer. Even minor disturbances of the skin surface can produce discomfort, especially in the facial area which has

an extensive network of sensory nerves. Moreover, because most cosmetics are applied to the highly permeable facial skin, the majority of reported cosmetic reactions occur in the face. Therefore, safety with regard to cosmetic products is a vital issue.

This is a nonspecific term used to describe any inflammatory skin disease resulting from contact with an irritant or allergenic substance. Whatever the causative agent, the clinical features are similar: itching, redness, and skin lesions. It is also often used (inaccurately) as a synonym for allergic contact dermatitis (ACD).

5.5.1. IRRITANT CONTACT DERMATITIS

Irritant contact dermatitis (ICD) is a term given to a complex group of localized inflammatory reactions that follow non-immunological damage to the skin. The inflammation may be the result of an acute toxic (usually chemical) insult to the skin, or of repeated and cumulative damage from weaker irritants (chemical or physical).

An irritant is any agent, physical or chemical, that is capable of producing cell damage if applied for sufficient time and in sufficient concentration. Acute ICD is the result of a single overwhelming exposure to a strong irritant or a series of brief physical or chemical contacts, leading to acute inflammation of the skin. An irritant reaction is a transient noneczematous dermatitis characterized by erythema, chapping, or dryness, and resulting from exposure to less potent irritants.

5.5.2 ALLERGIC CONTACT DERMATITIS

ACD occurs when a substance comes into contact with skin that has undergone an acquired specific alteration in its reactivity as a result of prior exposure of the skin to the substance eliciting the dermatitis. The skin response of ACD is delayed, immunologically mediated (Type IV), and consists of varying degrees of erythema, edema, papules, and papulovesicles. Patch testing is the gold standard; it is imperative for proving ACD, determining the actual allergen, predictive testing i.e. determining "safe" materials for the consumer, and exclusion of other diagnoses. Allergens are low-molecular-weight (500-1000 Da) molecules capable of penetrating the skin and binding to skin proteins to form a number of different antigens that may stimulate an allergic response in an individual. Common allergens in cosmetic products are fragrances (eg, cinnamic aldehyde) and preservatives (e.g., formaldehyde and formaldehyde donors).

5.5.3. PHOTOIRRITANT CONTACT DERMATITIS

Photoirritant contact dermatitis (PICD) is a chemically induced nonimmunological skin irritation requiring light. This reaction will occur in all individuals exposed to the chemical light combination. The clinical picture is that of erythema, edema, or vesiculation in sun exposed areas, resembling an exaggerated sunburn. This may be followed by hyperpigmentation, or if the exposure is repeated, scaling and lichenification may occur. Bergapten, a component of bergamot oil, which used to be a popular ingredient in perfume, is a potent photoirritant that causes berloque dermatitis.

5.5.4. PHOTOALLERGIC CONTACT DERMATITIS

Photoallergic contact dermatitis (PACD) is an immunological response to a substance that requires the presence of light. The substance in the skin absorbs photons and is converted to a

stable or unstable photoproduct, which binds to skin proteins to form an antigen, which then elicits a delayed hypersensitivity response. Examples of photoallergens present in cosmetics are musk ambrette and 6-methylcoumarin, which are present in fragrances Photopatch testing is the diagnostic procedure for photoallergy

5.6. HAIR AND SCALP

The sebaceous gland plays an important role in determining hair and scalp type. This production of sebum is a natural process that adds strength and lustre to the hair strand. However, diet, blood circulation, emotional distress and drugs and the aging process can all influence production. Salon products are designed specifically to compliment individual needs and work toward producing strong, healthy, naturally beautiful hair. Hair and Scalp types fall into the following broad categories:

5.6.1 OILY

Over-active sebaceous glands produce an excess quantity of sebum, which can make hair limp and lank. This may be due to hormonal changes, often evident during puberty or menopause. Many people have a naturally oily scalp, which can result in greasy hair. Fair hair is much finer than dark hair, hence is more susceptible to excess oil.

High quality shampoos cleanse without stripping the hair of essential moisture and nutrients.

5.6.2. DRY

Dry hair looks dull and lifeless and is also more susceptible to breakage. Dry hair can only be stretched 15% of its overall length before breaking, while healthy hair can be stretched up to twice this amount, more when wet! A common cause of dry hair is dehydration. Water retention can measure between 4 and 13% of overall hair volume.

A change in lifestyle can make all the difference, and there are many products available to help nourish the cortex and smooth cuticles,

5.6.3. NORMAL HAIR

Normal hair is shiny, supple and good looking and is the result of a well-balanced, healthy lifestyle, combined with good hair care using the right products.

66.4. MIXED CONDITION

active sebaceous glands and poor scalp condition may create a glut of sebum; this can be absorbed back into the scalp, preventing essential oils from travelling the length of the hair strand. The scalp in this condition is a common cause of Pityriasis steatoides. Mixed condition hair types have dry, frizzy ends that are prone to breaking with oily roots. In this scenario application techniques are very important when applying products to ensure the problem area is targeted.

5.7. ELEMENTS OF HEALTHY SCALP

Healthy hair starts at the scalp. Think of hair as a garden, with flowers that have roots in the soil. Scalp is the soil for hair! Without healthy soil that is full of nutrients and oxygen, while free of pollutants and harmful bacteria, a garden will never look its best. In the same way, the health of hair is a reflection of the health of scalp. There are five elements that help to maintain healthy scalp.

1. Moisture and Oils

Scalp contains oil glands that produce sebum, a natural oil that lubricates the hair strand as it grows. Sebum is essential for healthy, moisturized hair. If this oil is stripped from the scalp, hair will be dry and less manageable. Treat the scalp with beneficial oils like Natural oil (Jojoba oil), which mimics sebum, along with other oils that keep the roots and scalp moisturized and promote growth.

What to do:

- > Don't wash the hair too often (shampoo strips sebum out of scalp.) Shampoo with a sulfate-free, all-natural shampoo that won't strip or damage hair.
- > Enrich the diet with Omega-3s and fish oils to help keep scalp moisturized and balanced.

2. pH balance

A healthy scalp pH ranges from 4 to 5. Scalp pH is essential for moisture retention in hair, Acid causes the hair cuticle to flatten, helping it retain moisture. If the scalp is too basic/alkali, the cuticle opens up and the hair dries out more quickly. This target acidity also makes hair less prone to tangles, and a pH balance is optimal to prevent bacterial and fungus growth. Many products have an extremely high pH that disrupts the scalp balance However, products with a very low pH can degrade hair and skin.

What to do:

- > Use products that mimic the target pH of scalp. Stay away from alkali products (especially harsh shampoos.)

3. Cleanliness

Oil, hair products, dead skin cells, and dirt easily build up and clog the pores and follicles the scalp. This irritates the scalp, prevents hair growth, and creates a haven for fungus and bacteria to grow. Fungus, bacteria, and other infections can cause dandruff, itchiness, irritation, and many other problems. So keep the scalp clean.

What to do:

Clean the scalp regularly with a clarifying Use oil that combat bacterial growth

* Apple cider vinegar is both clarifying and microbial, so do occasional rinses to keep scalp clean

- > Exfoliate scalp regularly with a scalp scrub.
- > Avoid products with silicones or mineral oil, which coat the hair and build up on the scalp.

4. Circulation

Blood circulation brings oxygen and nutrients to scalp and hair follicles, which is essential for growth! Think of blood circulation to scalp like fertilizer for plants in a garden.

What to do:

- > Essential oils are extremely beneficial for blood circulation or other products with essential oils to improve circulation Give regular scalp massages to stimulate blood flow to the scalp. > Yoga and stretching help with circulation throughout the body.