



## The Review of Scalp Hair Health, Hair Growth, and Hair Care Products

Martha Srinivas<sup>1\*</sup>, S.kamalika<sup>\*2</sup>, J V C Sharma<sup>3</sup>

Associate Professor<sup>1</sup>, IV Year B.Pharmacy<sup>2</sup>, Professor<sup>3</sup>

<sup>1</sup>Department of Pharmaceutics, Joginpally BR Pharmacy College, JNTU Hyderabad, Telangana, India, 500075

<sup>2</sup>Department of Pharmacy, Joginpally BR Pharmacy College, JNTU Hyderabad, Telangana, India, 500075

<sup>3</sup>Department of Pharmacognosy, Joginpally BR Pharmacy College, JNTU Hyderabad, Telangana, India, 500075

<sup>1\*</sup>Corresponding Author: srinivaaspharma@gmail.com

**ABSTRACT:** Straightening treatments, hair colors, and henna, Hair cosmetics are a valuable technique for improving patient adherence to alopecia and scalp treatments. This article examines the formulas and modes of action of hair cosmetics such as shampoos, conditioners, hair well as the prescription and safety of these products. The dermatologist's expertise of hair care products, their use, and potential side effects can extend to a comprehension of cosmetic resources, allowing doctors to better treat hair and scalp disorders based on hair type and ethnically variety of hair. Cosmetics are a valuable technique for improving patient adherence to alopecia and scalp treatments. This article examines the formulas and modes of action of hair cosmetics such as shampoos, conditioners, hair straightening treatments, hair colors, and henna, as well as the prescription and safety of these products. The dermatologist's expertise of hair care products, their use, and potential side effects can extend to a comprehension of cosmetic resources, allowing doctors to better treat hair and scalp disorders based on hair type and ethnically variety. It is clear that they understand the significance of hair care. The cuticles on hair treatment- treated hairs were less peeling and falling off when observed using electron microscopy than those on non-hair treatment-treated hairs. As a result, people should learn as much as they can about hair cosmetics in order to properly care for their hair. Hair cosmetic companies should also provide precise information that the general public may easily acquire.

**Key words:** Hair, hair care, hair cosmetics, Herbal shampoo, hair tonics, hair straightens.

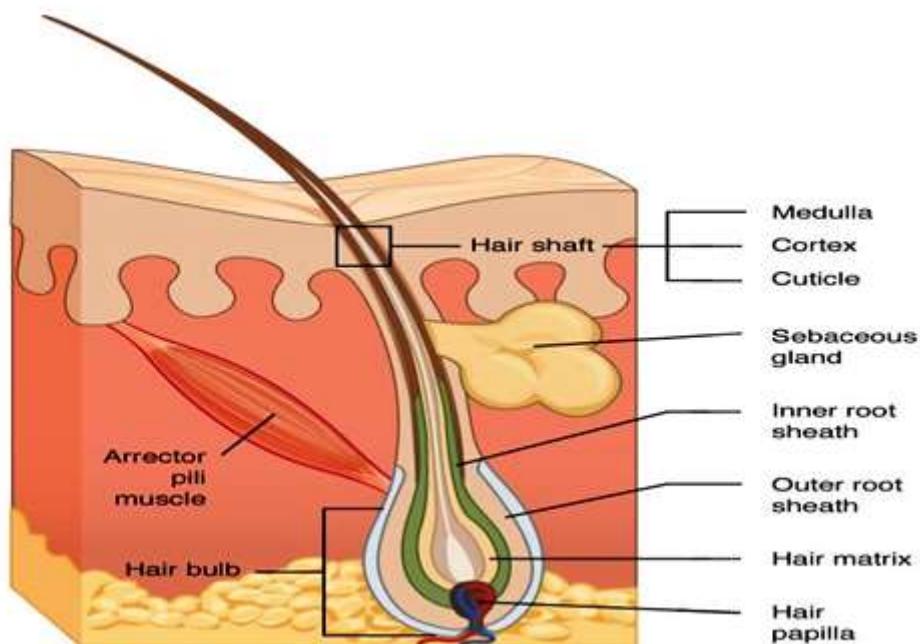
### 1. INTRODUCTION

#### 1.1 Hair

Hair is a complex system with unusual chemical and physical properties. It's a complicated structure made up of various morphological components that work together as a whole. The cuticle, cortex, and medulla are the three primary sections of a mammalian hair shaft. The medulla is present in coarse hair, such as grey hair, thick hair, and beard hair, but not in fine children's hair. Asians' coarser hair has more medulla than Caucasians'.

The medulla may be crucial in hair splitting because it provides a point of weakness that causes cracks to progress along the fibers axis. The cuticle, like shingles on a roof, is a chemically resistant region made up of tiny overlapping scales (keratinocytes) (keratinocytes). The differential friction effect in hair is created by the shape and orientation of the cuticle cells. Asian hair has a cuticle that is 6–8 scales thick, slightly less in Caucasians, and even less in African hair. African hair is more prone to breakage due to its thinner cuticle layer. The epicuticle is a thin proteinaceous membrane that is covered by a lipid layer that contains 18-methyl eicosanoic acid (18-MEA) and free lipids. The A-layer, the exocuticle or B-layer, and the endocuticle are three layers beneath the cuticle cell membranes, all of which contain strongly cross-linked protein, mostly cystine. The first one contains the

most cystine, whilst the third one contains the least. The cortex, which is composed up of elongated, fusiform cells connected by a CMC and contains protein and melanin granules, makes up the majority of the mass of human hair. The cortex cell also contains macrofibrils, which are spindle-shaped fibrous structures made up of microfibrils, which are highly structured fibrillar units, and matrix. The matrix is made up of crystalline cystine-rich protein. In a spiral structure, the macrofibrils are arranged. Protofilaments are subfilamentous units found inside microfibrils that consist small bits of alpha-helical proteins in coiled coil producing polypeptide chains. The objective of the hair straightening process is to break the forces that hold the coil in place, allowing it to be expanded. The act of rupturing chemical bonds and curling the hair is known as “perm,” which stands for “permanent curling.” Hair reduction involves the use of alkaline substances such as sodium or lithium hydroxide, guanidine, and ammonium thioglycolate with a pH greater than 9.0. All of these can cause splits or fissures in the endocuticle and CMC, but the greatest cause of hair damage after using hair lowering treatments is misapplication and lack of care when combing hair in the decreased. Figure 1 depicts the hair follicle anatomy.<sup>[1-3]</sup>



**Figure 1: The anatomy of hair follicle**

## 1.2 Reason for hair loss/ hair damage<sup>3</sup>

- 1) **Stress:** Although emotional stress is less likely than physical stress to cause hair loss, it can still occur in situations such as divorce, ageing parents, or the death of a loved one. It would be beneficial to have a hair fall tip to manage stress and anxiety using yoga, meditation, and talk therapy.
- 2) **Dietary habits:** Vitamin deficiency is the leading cause of hair loss. Hair loss is commonly caused by low vitamin B levels and a lack of necessary minerals. It occurs when there is a lack of nutrients in the diet and the food is not nutritious. Staying away from meals that promote hair loss and replacing them with nutritious foods like lean proteins and plenty of fruits and vegetables is one of the solutions to this hair loss problem.
- 3) **Protein Shortage:** Hair loss is frequently caused by a protein deficiency. If you don't get enough protein in your diet, your body will break down more protein. This depletes the hair of the required protein for growth and prevents the inflow of keratin into the hair. Consume extra protein and necessary fats to promote hair development.
- 4) **Chemical-based products/wrong products:** One of the most common causes of hair loss is the use of incorrect hair products. It's always a good idea to utilise products that keep your hair healthy and prevent hair loss. Anti-dandruff shampoo and conditioner for dry or damaged hair, for example, will not help you fix the problem. Instead, use a shampoo that is designed to help you combat hair loss in a targeted approach.
- 5) **Heredity:** Hair loss can be caused by genetic diversity, which is a significant factor. Hair loss with a pattern is inherited by both males and women. Hair loss is caused by a number of genes that have been found. This is why it's typical to hear that hair loss runs in families.

### 1.3 Medical Procedures<sup>6</sup>

Aside from drugs, there are a variety of alternative medical procedures to consider, such as laser therapy, which uses low-level lasers to enhance hair density in patients who have genetic hair loss.

#### 1.3.1 Natural herbs for hair growth

##### 1.3.1.1 Aloe vera

The use of Aloe Vera gel on a regular basis will aid in the maintenance of the hair's pH balance. It will also aid in the opening of blocked scalp pores and the stimulation of hair follicle development.

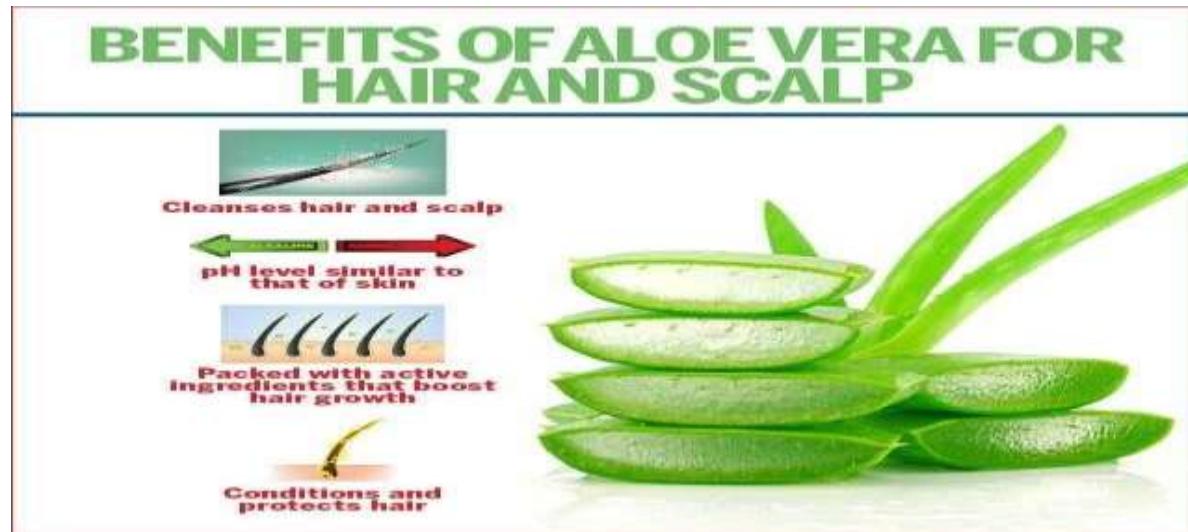


Figure 2: Aloe vera for hair

##### 1.3.1.2 Lavender

Lavender is one of the most well-known herbs for promoting hair growth and reducing balding. *Lavandula angustifolia* oil has anti-inflammatory, anti-microbial, and antiseptic properties. Lavender oil improves scalp circulation, strengthens new hair growth, and helps to regulate the scalp's natural oil production. Lavender oil is also a natural insect repellent, making it effective against disease-carrying parasites such as fleas, ticks, mosquitoes, and head lice.



Figure 3: Lavender for hair

### 1.3.1.3 Hibiscus

Hibiscus is packed full of antioxidants and vitamins that help to improve the overall health of the scalp and hair. It is also a very effective treatment for dandruff which can interfere with healthy hair growth



**Figure 4: Hibiscus for hair growth**

### 1.4 FACTORS AFFECTING HAIR GROWTH

- a. Rest and sleep
- b. Climate also effect the hair growth
- c. Exercise, stress, genes
- d. Vitamins and minerals effect the hair growth
- e. Moderate exercise regime help stimulate
- f. Habits those are beneficial for the tresses

## 2. TREATMENT OF HAIR LOSS

A patient's quality of life might be negatively impacted by hair loss, which can be distressing. Family doctors may be the first place to look for patients with diffuse or patchy thinning hair. Scarring alopecia should be evaluated by a dermatologist, who is the best person to do so. This type of alopecia, known as alopecia areata, can be diagnosed and treated by your family doctor. Alopecia can be treated with Androgenetic Minoxidil, which is clinically diagnosed. By its distinctive areas of hair loss, Alopecia areata can be identified. Hair loss is a condition that has a finite course. Baldness can be caused by Tinea capitis and needs to be addressed. The treatment should be systemic. Non-inflammatory and non-scarring, telogen effluvium is an alopecia that occurs unexpectedly. Stress, either physical or emotional, is to fault. When the triggering source is removed, hair normally comes back. In order to treat trichotillomania, the underlying psychological issue must be addressed. Condition. Damaged hairs are called Trichorrhexis nodosa, and they are broken by stress.

### 2.1 Herbal products

Tea bags, pills, tablets, liquids, and powders are among the various types available. Black cohosh, echinacea, garlic, ginkgo, saw palmetto, and St. John's wort are examples of common herbal health remedies and supplements. These are some examples of herbal products.

## 2.1.1 Ingredients/composition

**Table No 1: Composition of Natural Herbs and Quantities**

Ingredients	Quantity
Soap nuts	25g (1/3) cup
Dried gooseberry	25g (1/3) cup
Dried shikakai	25g (1/3)cup
Aloe vera	½ cup (64g)
Hibiscus	½ cup(64g)
Tulsi leaves	½ cup(64g)

## 2.2 Natural herbs for hair:

Herbal medicines are one type of dietary supplement. They are sold as tablets, capsules, powders, teas, extracts, and fresh or dried plants. People use herbal medicines to try to maintain or improve their health. Many people believe that products labeled “natural” are always safe and good for them.

### 2.2.1 Best Herbs for Hair Growth for Natural Hair

Ginseng, Aloe Vera, Lavender, Hibiscus, Rose Petals, Ginseng, Gin

The well-known Chinese plant is a natural herbal cure for a variety of ailments, including hair loss.

Green Tea is a famous natural plant because of its numerous health advantages.

Below figure 5 represent the herbs used for hair growth.



**Figure 5: Ayurveda herbs**

## 3. HAIR TONICS

Visual examination of colour, scent, and uniformity were all part of the organoleptic test. The pH of the test solution was determined using a pH metre that had been calibrated by dipping the electrode in two different solutions and assuming that the pH of the test solution was between the two. PH 4 and pH 7 are the most widely utilised solutions. Wet and dry pycnometers were used to determine the specific weight. The empty pycnometer (w1) was weighed and filled with distilled water at room temperature, while the outside was wiped dry and weighed (w2). The distilled water was thrown away. The pycnometer was then dried and loaded with hair tonic before being weighed (w3). The viscosity was determined by timing the time it took the liquid to pass through two markings as it flowed down a vertical capillary tube using an Ostwald viscometer. The hedonic test was carried

out on the aroma, feel, and taste. Fig 6 represents the hair tonics.<sup>10-12</sup>

### 3.1 Advantages of Using a Hair Tonic

Hair tonics offer a variety of benefits that assist many people in resolving hair and scalp difficulties. There is probably a hair tonic recipe that will work for you, whether your hair is long, short, dry, greasy, wavy, straight, thick or thin (or even if you don't have any hair at all).

- Hair and scalp are moisturised.
- Improves the pH balance of the scalp
- Itching and dandruff are reduced.
- Restores the ability to manage
- Adds lustre and sheen.
- Other hair product build-up and residue are broken down.
- Cleans hair follicles that have become blocked.
- Prevents hair loss by avoiding split ends and breaking.
- Hair growth and thickness are boosted.

### 3.2 Consequences of hair tonics

Although some people may feel that the aroma of an over-the-counter hair tonic clashes with their perfumes, colognes, body lotions, or deodorants, there aren't many negative side effects to taking one.

If you're using a prescription-strength pharmaceutical hair tonic (which is often intended to enhance hair growth), see your doctor about potential side effects.



**Figure 6: Marketed hair tonics**

## 4. HAIR COSMETICS REACTIONS

The following are the most common reactions to cosmetic chemicals, in decreasing order of Frequency: Formaldehyde, parabens, quaternium-15 (a formaldehyde donor).

Have been left on in most cases, short-contact cosmetics do not cause irritation or allergies.

Edema of the eyelids was described by Van Lerberghe and Baeck. The patient received a Hair-smoothing treatment the day before, using INOAR Moroccan Hair Treatment Containing formaldehyde that her stylist had purchased in Morocco.

#### 4.1 HENNA

Her stylist had acquired a formaldehyde-containing hair treatment in Morocco. The patch Test revealed that formaldehyde and non formaldehyde components were present. The dried and powdered leaf of Lawson inermis is used to make red henna. Henna has long been used as a skin, Hair, and nail color. There have been a few cases of allergic contact dermatitis due to the use of Red henna and/or its active component Lawson .Type I allergy is uncommon and mostly affects hairdressers as a work-related Hazard (sneezing, conjunctivitis, running nose, dry cough, dyspnoea, swelling of the face, or Generalised urticaria). Because lawsone is a powerful oxidant of G6PD-deficient cells, henna used topically to children with G6PD deficiency could result in life-threatening haemolysis.



Figure 7: Banjara's Herbal Henna



Figure 8: Marketed Hair dyes

#### 4.2 HAIR DYES

Hair dyes are divided into several categories based on whether the dye penetrates the surface or the deeper layers of the hair shaft.

We'll look at the two most common forms of hair dyes in this chapter: demi-permanent and permanent dyes. (Above fig 8 represent hair dyes).

The key difference between the dyes is whether they can reach the brain and stay there permanently, Or if they can't reach the cortex and stay shallow on the cuticle surface, washing after 10-15 Shampoos. Demi-permanent dyes are those. The product must have an alkaline pH capable of Opening the scales inorder to penetrate the cuticle and reach the cortex. Ammonia is commonly used to raise the pH of permanent dyes. Some goods claim to be ammonia-free; however they really contain ethanolamine for that purpose. Both compounds deplete the natural cuticle lipid 18-mreall Eicosanoic acid, which gives protection to the skin.Because of its endurance and capacity to lighten the original darker color, permanent hair colours are the most often used hair colours.

They're also ideal for grey or white covers. The coloration is permanent, and the white hair that appears 10-15 Days after application is not due to shampoo removing the dye, but rather to new hair growth.

Permanent dyeing is a type of oxidation that allows colours to penetrate the cortex. Para- Phenylenediamine, para-toluenediamine, and para- aminophenol (known as the principal Intermediates) are pigments that are combined with hydrogen peroxide to liberate oxygen. They also Contain resorcinol, albeit this chemical is rapidly being phased out of several markets for safety Reasons. They mix with aniline dyes once within the cortex to form the needed colour molecules. After 15–30 days, the roots will need to be touched up, and the product will need to be reapplied.<sup>10</sup>

## 5. TREATMENTS FOR HAIR FALL

### Hair loss treatments are one option for dealing with hair loss:

When someone arrives with hair loss, a medication evaluation is necessary to see if there is a nutritional shortage such as anaemia, thyroid problem, or PCOS. It's possible that blood tests will be required to confirm this. The treatment must include the treatment of any medical conditions that may present. In this case, a timely visit with your dermatologist will be beneficial. Even if you don't have such significant issues, you can take nutritional supplements to prevent hair loss under the supervision of a doctor.

Hair treatments from VCare are the best responders for all forms of hair loss and scalp damage. More than a million people have benefited from a full hair regeneration method developed after years of thorough research and technological improvement. Our skilled trichologists and hair care professionals at VCare will thoroughly analyses your current hair and scalp condition and recommend the best treatment option for you to achieve the greatest results.<sup>14</sup>

## 6. HERBAL SHAMPOO

Shampoos are normally made up of 10–30 ingredients, while there are others that have as little as four. The ingredients are divided into four categories: (1) cleansing Agents; (2) additives that contribute to the product's stability and comfort; (3) Conditioning agents that impart softness and gloss, reduce flyaway, and improve Disentangling ability; and (4) special care ingredients that target specific issues like Dandruff and greasy hair Shampoos not only clean the scalp, but they also protect the hair shaft from Damage.<sup>4</sup> Active chemicals added to shampoo formulas can also treat a variety of Scalp ailments. Whatever the disease or condition (dermatitis, seborrhea, alopecia, Psoriasis), it is preferable to keep the hair strands visually presentable by retaining Their softness, combability, and lustre while treating the scalp.<sup>5</sup>

- Untangling the strands is difficult, and the frizz effect is noticeable. The main cause of frizz is attrition, which can be reduced with proper cleaning solution formulation. Fiber attrition is exacerbated if the shampoo formulae do not include the appropriate composition. fig 10 are the herbal shampoo
- Despite their reputation as safe goods, shampoos can cause contact dermatitis. Allergens in shampoos include Cocamidopropyl betaine, methylchloroisothiazolinone, formaldehyde-releasing preservatives, propylene glycol, Vitamin E (tocopherol), parabens, and benzophenones.<sup>7</sup>



Figure 9: Marketed Herbal shampoos

### 6.1 Need of shampoo

Shampoo is one of those things that most of us take for granted. We get in the Shower, lather up, and rinse. However, if you've ever had hair or scalp issues, you Know that the kind of shampoo you use matters. Here are ten reasons why shampoos Important, including reasons that go beyond your hair.<sup>8</sup>

- Shampoo keeps your scalp clean
- It can make your hair oilier
- It can dry out your scalp
- Shampoo can help with hair loss
- Washing your hair reduces cortisol
- They can clean chrome and carpet
- Shampoo can clean your hairbrushes
- People are drawn to natural and organic shampoo

## 6.2 Ideal properties of shampoo

- Remove dirt completely
- Readily removed
- Low toxicity
- Smooth and shiny
- Good bio degradable
- No irritation
- Produce foam

## 7. CONDITIONERS

The purpose of a hair-conditioning ingredient is to give the hair manageability, shine, and Antistatic characteristics. This might be incorporated in the shampoo, which would then serve both a cleaner and a conditioner. Silicone (dimethicone) droplets contained in a surfactant Mixture were used by Procter and Gamble to produce “2 in 1” shampoos/conditioners in 1987. These are ideal for those who want to shampoo their hair every day and for those who have dry, Damaged, or chemically treated hair. Hydrolyzed silk and animal protein, glycerin, dimethicone, Simethicone, polyvinylpyrrolidone, propylene glycol, and stearal – konium chloride are all Common conditioning agents. Split ends, also known as trichoptilosis, can be temporarily repaired with protein-derived compounds found in conditioners. The cortical fragments are helped Fig 10 (Are some conditioners used for hair) Together until the next shampooing by protein attracted to the keratin. The appropriate

Conditioner can restore the fiber's hydrophobicity while also neutralising static electricity. The conditioner May reach the cuticle surface or the interior section of the cortex, depending on its ability to enter the fibre. Smaller molecules have a better chance of reaching the cortex. The cuticle is affected by the larger ones. Polypeptides with a low molecular weight (less than 10,000 Da) can diffuse into hair. On bleached hair, larger molecules (500,000 Da) can disperse through the cuticle. Although intracellular diffusion is possible, intercellular diffusion or diffusion through Nonkeratin areas is favoured. Polymers with a higher molecular weight (600,000 Da) may adsorb on the hair shaft's surface. Hair products using cationic chemicals, such as cationic Polymers, are particularly popular.<sup>9</sup>

### 7.1 Functions of the conditioners

- Improve combability
- Mimic the hair natural lipid outer layer
- Restore hydrophobicity
- Seal the cuticle
- Avoid or minimize frizz, friction: Neutralize the negative charge.



**Figure 10: Marketed hair Conditioners**

## 8. SHAMPOO AND CONDITIONER

Adopting a healthy hair wash practise is important not only for hair hygiene but also for its long- Term health. Choosing the proper shampoo and conditioner for your hair type is also an importlong Part of creating the ideal hair care regimen. You must determine the purpose of the substances in your potential hair care products in order to select the best option for you. In this post, we'll go overall of the well-known and lesser-known advantages of utilizing shampoos and conditioners.<sup>16</sup>

### Why do we use conditioner after shampoo?

A shampoo can only remove dirt, oil, and product buildup, as previously stated. Apply the shampoo to avoid drying out your hair's ends, apply only to your scalp.

Conditioner aids in the replacement of moisture in the middle and ends of your hair. It's vital to get shampoo and conditioner that are again suited to your hair type.

### How often should you use shampoo and conditioner?

As previously stated, a shampoo can only eliminate dirt, oil, and product buildup. To avoidDrying out your hair ends, apply the shampoo only to your scalp. Conditioner replenishes Moisture in the middle and ends of your hair. Once again, it's vital to find shampoo and Conditioner that are appropriate for your hair type.

### Is it possible for shampoos and conditioners to have negative side effects?

Shampoos and conditioners rarely cause allergic reactions. It is well recognised that a pH greater Than 5.5 might irritate the scalp. Damage to the hair shaft can occur if the improper kind of shampoo is used on a regular basis for the type of hair a person possesses, especially if no conditioners are used to preserve and restore the hair. When a person complains of skin eruptions around applicationSites and a feeling of unease with these hair care products, be cautious.

## 9. CONCLUSION

This review article contains information about hair, hair growth natural, hair care products, and Hair tonics, herbal products, hair care cosmetics, shampoo conditioner, and combinations of shampoo and conditioner. The article explains the significance of herbs used for hair. The ethnic hair care industry has already grown to be a multibillion-dollar sector, fueled by expanding trends like natural hair. When it comes to hair care, there are a lot of questions and problems that comes up Hygiene.Indeed, the goal of cosmetic technology is to develop new methods and procedures for the development of cosmetic goods that are primarily composed of natural origin materials while minimising associated costs and meeting market demands. Hair with a lustrous sheen, a smooth texture, and clean-cut ends is thought to be healthy. Consumer demand for hair care products has risen in recent years, particularly in the field of natural goods. As a result, this review focuses on hair care and cosmetics technologies, emphasising the importance of shampoo in various forms and formulations.

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