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COSMETICS AND THEIR ASSOCIATED ADVERSE EFFECT

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ABSTRACT

The Greek term "kosmeticos," which means to embellish, is where the word "cosmetics" originates. Since ancient times, cosmetics have included elements meant to enhance or beautify one's look. The need for attractive appearance is universal, and the idea of cosmetics is as old as humanity and civilisation. Since the days of the early tribes, humans have felt the impulse to enhance their physical appearance. Women utilise a variety of cosmetic goods, such as skincare, hair, fragrance, dental hygiene, and nail care items, that may include hazardous chemicals that are bad for their health.Cosmetics have been used to improve human body appearance for a very long period. People are enticed to fake their appearance as a remedy for their insecurities in a world that is preoccupied with beauty. The approximate cost of cosmetic Global industry nowadays is estimated to be worth $20 billion. As consumers, we are drawn to using cosmetics and personal care items regularly. However, these products, which are meantto improve our health and appearance, have a sinister underbelly. a number of harmful substances and risky Excessive amounts of chemicals used in cosmetics are included. These substances have the potential to have major negative effects on skin and to enter the body and cause cancer in the skin and other organs. In addition to infiltrating the fashion industry, cosmetics are now a significant part of daily life. Making people aware of the numerous negative consequences of cosmetics and the chemicals presentin them becomes essential.

KEYWORDS: Hazards, Cosmetics, Chemicals, Heavy Metals, Skin, and Health.

INTRODUCTION

Cosmetics are substances that are applied to the body with the intention of boosting attractive traits and beautifying, cleaning, or improving appearance.[1] Cosmetics include a variety of items like tooth paste, shampoo, conditioners, mascara, after-shave lotion, styling gel, creams, lotions, powders, lipsticks, fingernail and toenail polish, eye and facial makeup, hair wavers, hair dye, hair spray, deodorants, and antiperspirants. According to the definition of "make up," it is a type of cosmetic that generally refers to coloured items used to change a person's appearance.[2] Schneider et al defined skincare items or cosmetics as combinations of artificial or natural chemical substances intended to enhance the body's look or odour.They fall into two categories:- They are items designed to be injected into, rubbed on, poured, sprinkled, sprayed, or otherwise administered to the human body or any part thereof for without damaging the body's structure or functioning, enhancing attractiveness, cleaning, beautifying, or changing the appearance.

Common cosmetics products and associated toxicities

Most women choose the skincare products they use based on influences including advertising, peer pressure, and societal acceptance. Robertson et al. did a study and came to the conclusion that women who wear makeup are uneasy, insecure, and lacking in confidence.[3] A variety of hazardous or dangerous compounds used in cosmetic items can have negative effects on skin. the producers of Cosmetic items also include natural components like Shea butter, rose extract, and cane sugar in addition to synthetic ones. which are affordable, environmentally friendly, and less damaging to consumers.[4] Skincare items like perfumes, cosmetics, nail polish, and other items last longer on the skin and can have negative effects including allergic responses.

Skin Lightening Agent

One of the most hazardous compounds is determined to be skin-lightening treatments like hydroquinone (HQ). Reports of ochronosis and possible mutagenicity have been discovered. Ochronosis is a rare side effect of HQ that includes characteristics like a gradual darkening of the area where the cream with high concentrations of HQ is administered for many years. A hydroxyphenolic substance called hydroquinoneprevents the production of melanin by inhibiting the tyrosinase enzyme. It also prevents the development or breakdown of melanosomes and prevents the creation of DNA and RNA in melanocytes. The most widely used depigmenting agent today is hydroquinone, although it has been discovered to be highly cytotoxic to melanocytes and perhaps

mutagenic to mammalian cells.[5] It induces exogenous ochronosis as well as irritation, redness, and burning. Only minor skin patches and the treatment of conditions like age spots or sun spots were permitted.[6]

Black Henna

For temporary "black henna tattoos," red henna and pphenylenediamine (PPD) are usedto create black henna. Due to the inclusion of p-phenylenediamine (PPD), which can befound in the form of synthetic hair dye added into henna paste, black henna tattoos arechemical stains. PPD is added to henna to intensify and darken the colour, speed up the dyeing and drying process (to only 30 minutes), improve the tattoo's design pattern, and lengthen the tattoo's lifespan. Blisters, surface leaking, swelling, and erythromatousrashes on the skin are all side symptoms of PPD. The use of henna dyes might cause acute allergic reactions, according to studies and observations. Numerous instances where there was no skin reaction but instead there was sneezing, runny nose, coughing, and shortness of breath have been discovered.[7][8]

Sunscreen Product

Today's sunscreen products may trigger allergic, phototoxic, irritating, or photoallergic reactions. A lot of people are sensitive to benzophenones. While cinnamates, paraaminobenzoic acid (PABA), and debenzoyl methanes could result in photoallergic dermatitis.[9] The aroma or other components are the main culprits in allergic responses linked to deodorants, antiperspirants, and fragrances. Fragrances can enter the body through the skin (adsorption), lungs, airways, ingestion, and pathways from the nose straight to the brain, which can result in symptoms such as headaches, weariness, eye, nose, and throat irritation, forgetfulness, and others. Airborne contact dermatitis can be brought on when scents are sprayed into the air or are detected in the air. Phethleugenol and coumarins, which are typically found in scents, are thought to be carcinogens, whereas phthalates are thought to be hormone disruptors.

Shampoos

Shampoos and conditioners have relatively little skin contact time because they are solely administered to the hair, which means they have less negative effects. The issue emerges, though, when they come into touch with the eyes while washing the hair. The scalp hair matting, also known as tangling of hair, is the most frequent side effect of using shampoo.[10] The pH of the shampoo should be taken into account. The majority of shampoos have an alkaline pH, which enlarges the hair shaft and makes the hair more susceptible to damage. The ideal shampoo for chemically treated hair—whether from permanent colouring or permanent waving—has a pH that is neutral.[11] Ammonium persulfate and hydrogen peroxide solutions are two active components in hair bleaching products that have the potential to trigger Types I and IV allergic contactreactions.

Health hazards associated with chemical used in formulation of cosmetics

BHA And BHT

The synthetic compounds BHA (butylated hydroxyl anisole) and BHT (butylated hydroxyl toluene), which are employed as preservatives in moisturisers and lipsticks among other cosmetics, are closely related. The skin may respond allergically to BHA and BHT. The BHA has been identified by the as a potential human carcinogen. The International Agency for Cancer Research. Based on findings that it disrupts hormone function, the European Commission on Endocrine Disruption has also listed BHA as a Category I priority substance.[12] In some circumstances, BHT may encourage the growth of tumours. Little evidence suggests that large dosages of BHT may resemble oestrogen, the main hormone involved in female sex, and block the expression of male sex hormones, which could have harmful effectson reproduction.

Coal Tar Dyes

There are numerous compounds derived from petroleum that make up coal tar. The majority of colours made from coal tar are used in cosmetics, and they are often designated by a five- digit Colour Index (CI) number. A typical coal tar dye used in numerous hair colours is p-phenylenediamine. Darker hair dyes contain phenylenediamine more frequently than lighter ones. Stinging sensations, an erythromatous rash, swelling, blisters, and surface leaking are all side effects of p-phenylenediamine. The use of henna dyes has been linked to numerous reports of acute allergic (and also anaphylactic) reactions in the literature.[13] Instead of skin reactions, the majority of patients present with sneezing, runny nose, coughing, and shortness of breath. The biggest issue with specific coal tar colours (whether made from coal tar or synthetically) is their potential to induce cancer. Coal tar may potentially be linked to cancer. Low concentrations of heavy metals may be detected in these colours, and some of them are mixed with aluminium substrate. Many heavy metals, including aluminium compounds, can harm the brain. Despite being used in potentially ingestible cosmetics like lipstick, some of the colours used to make these dyes are not permitted as food additives. It has been determined that p-phenylenediamine causes cancer.[14]

Di butyl phthalate (DBP)

DBP is primarily used in nail care products as a plasticizer to keep nail polish from drying up and hardening and as a dye solvent. It has been demonstrated to result in developmental flaws and alterations. Decreases sperm counts in the testicles and prostate.[15] Additionally, it has been discovered that it interferes with hormone function, acting as a probable endocrine disruptor that could harm an unborn child and aggravate infertility. According to numerous studies, prolonged consumption of items containing phthalates can result in catastrophic health problems such liver and renal failure in young children.[16] [17] It has been discovered that phthalates have a number

of negative health impacts, including a reduction in men's sperm counts and reproductive abnormalities in the growing male foetus (when the mother is exposed while pregnant).

Parabens

Preservatives are employed to shield cosmetics from microbiological contamination. Parabens are the preservative that is most frequently used in cosmetics. Parabens are present in cosmetics in between 75 and 90 percent of cases, usually in extremely small amounts. Endocrine disruption is thought to be caused by the ease with which parabenspenetrate the epidermis. They imitate oestrogens, the main hormone involved in female sex. Additionally, they could obstruct male reproductive processes. According to numerous studies, when methylparaben is applied to the skin, it interacts with other chemicals and speeds up the ageing process and damages DNA.[18] Parabens are also present in some foods, including barley, strawberries, carrots, onions, currents, and vanilla.[19] Using parabens in food is When consumed, they are metabolised, which weakens their estrogenic effects. On the other hand, parabens in cosmetics skip the metabolic process and enter the blood stream and human organs unaltered when applied to the skin and absorbed into the body. Women are exposed to 50 mg of parabens from cosmetics each day, according to research.

Perfume (Fragrance)

Using a combination of aromatic chemicals, essential oils, and solvents, perfume is used to offer the human body, animals, Around 3,000 chemicals are used as fragrances. Fragrance is a main ingredient in perfumes, deodorants, and colognes. Almost all cosmetic products contain fragrances, even if they are marketed as "fragrance-free" or "unscented" may contain fragrance ingredients in the formulation. Perfumes are used togive a pleasant scent to an individual's body. They are typically found in liquid form. Many of the undeclared fragrance compounds are irritants that can exacerbate allergies, migraines, and asthma symptoms. The use of perfume may make asthma symptoms worse or possibly hasten the onset of asthma in youngsters. It is listed as the second most typical factor in patient allergies.[20]

Polyethylene glycol (PEG)

Petroleum-based substances known as polyethylene glycols (PEGs) are frequently employed in creams as thickeners, solvents, softeners, and moisture-carriers. PEGs may become contaminated with 1, 4-dioxane in detectable concentrations during productionoperations. It has been determined that this 1, 4-dioxane causes cancer. It is difficult todecay and may linger in the environment for a long time after being flushed down the shower drain.[21] PEGs can irritate the skin and be hazardous to the body when appliedto damaged skin. They also have some indications of genotoxicity.

Petrolatum

In a variety of moisturisers, petroleum jelly serves as a barrier to keep moisture in the skin. In order to make hair care products shine, it is utilised. It also goes by the name mineral oil jelly. Polycyclic Petrolatum may include aromatic hydrocarbons (PAHs) asa contaminant. Numerous studies have revealed that PAH exposure over a lengthy period of time may be linked to cancer. Because of this, the European Union limits the use of petrolatum in cosmetics and classifies it as a carcinogen. Allergies and skin irritability may also be brought on by PAHs in petrolatum.[22]

Siloxane

Siloxanes are silicone-based substances that give softness and smoothness to a variety of cosmetic products. They speed up the drying process for hair products and improve the spreadability of deodorant creams. They are most frequently utilised in face treatments and moisturisers. Cyclotetrasiloxane and cyclopentasiloxane are the two most often utilised siloxanes that are hazardous. These substances could bioaccumulatein aquatic creatures. Cyclotetrasiloxane is a sort of endocrine disruptor since it interferes with how human hormones work and because it may be damaging to the reproductive system, it may also reduce fertility in humans.[23]

Health risks with Associated Heavy Metals in Cosmetics

Commonly used by women cosmetics have heavy metals in them.[24] Literature reviews have examined the negative consequences of heavy metals in numerous cosmetic goods, including facial makeup.[25] The accumulation of heavy metals in the body over time are known to result in a number of health issues. Cancer, reproductive and developmental abnormalities, neurological issues, cardiovascular, skeletal, blood, immune system, kidney and renal problems, headaches, vomiting, nausea, and diarrhoea, as well as lung damage, are some of the health dangers linked to the use of heavy metals in cosmetics. Additionally, they may result in contact dermatitis, brittle hair, and hair loss. While some heavy metals are respiratory poisons, others are hormone disruptors. They can be ingested or absorbed through broken skin to enter the body.[26]

Cadmium

The environment naturally contains cadmium. present cadmium Although it can be found in body and hair creams, the body absorbs them through dermal contact and stores them in the liver and kidney. in the majority of adult tissues. It is regarded as "carcinogenic to humans and its compounds, classified as known human carcinogens by the United States Department of Health and Human Services," according to the IARC.[27] High doses can cause severe stomach discomfort, vomiting, and diarrhoea,while prolonged exposure to low doses can harm the kidneys, cause bone deformation, and make bones more brittle and prone to breaking.

Lead

Lipsticks can include lead as an impurity thanks to the use of Using colours that are polluted by raw materials lead might be present.[28] Daily skin contact with lead has been observed to cause some lead to be absorbed via the skin. The Blood-lead levels in children and women have been linked to the use of leaded eye powders (such Surma and Kohl).[29] Because it can easily pass the placenta and enter the fetus's brain, pregnant women and young children are more at danger. Additionally, it can be stored in bones and passed on to infants through breastfeeding mothers' milk.[30] [31] Miscarriages, hormonal abnormalities, decreased fertility in men and women, irregular menstruation, and delayed onset of puberty in girls have all been linked to lead exposure.[28] Inorganic and lead Lead-based chemicals have been identified as potentially cancer-causing to humans.[26]

Nickel

Everyone is exposed to nickel in minute amounts through food, air, portable water, soil, household dust, and skin contact with products that contain it, such as cosmetics. Nickel is abundant in nature.[29] Depending on the route and the type of nickel exposed to, high exposure levels can have major health impacts.[29] Metallic Nickel and its alloys have been identified as potentially carcinogenic to humans, despite the fact that some forms of nickel are regarded as "toxic" due to their ability to induce cancer.[26] In addition to being allergenic, nickel can also induce severe contact dermatitis.[29] Eventhough 1 ppm of nickel can cause an allergy to flare up, eye makeup has been linked tothe first occurrence of nickel allergy.[32]

Mercury

Commonly found in skin-lightening soaps and lotions is mercury. Other cosmetics including mascara, eye makeup, and cleaning supplies also include it. Some African and Asian nations make extensive use of skin-lightening soaps and lotions.[33] By preventing the production of melanin, mercury salts lighten the skin's colour. In cosmetics, mercury can be found in both inorganic and organic forms. Inorganic mercury, such as ammoniated mercury, is utilised in soaps and creams as a skin- lightening ingredient. Ethyl mercury and phenyl mercuric salts are examples of organic mercury compounds are preservatives that are used in cosmetics like mascara, cleaningproducts, and eye makeup. Kidney damage is the principal side effect linked to the inorganic mercury found in skin lightening soaps and lotions.[34] Skin rashes, skin discolouration, and scarring, as well as a decrease in the skin's resistance to bacterial and fungal infections, can all occur when mercury is present in skin-lightening treatments. Peripheral neuropathy, anxiety, sadness, or psychosis are additional adverse effects. Eventually, the mercury from soaps, creams, and other cosmetic goods gets released into the wastewater. The mercury is subsequently released into the environment, where it is methylated and forms highly poisonous methyl mercury, which eventually enters the food chain as fish. Methylmercury is passed to the foetus when pregnant women eat fish containing the substance, which can cause neuro- developmental impairments in the offspring.[35]

CONCLUSION

The hazardous ingredients that are frequently contained in cosmetic items' compositions are blamed for persistent unpleasant effects and potential health hazards. Although the different systems in place across the world to regulate and oversee the quality of cosmetics are fairly intricate and thorough, they should be more stringent when adding new compounds with the potential to be harmful to the composition of cosmetics in order to prevent harm to human health. It is essential to implement a global cosmeto- vigilance in order to promote improvements in the production, marketing, and consumer usage of cosmetic products. In order to avoid the hazards connected with the use of cosmetics from becoming a significant public health concern, this public health strategy is an effective way to learn about the safety of cosmetic products and their contents.

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