



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

“Fragrances Used In Baby Care Products And Its Health Hazards”

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Abstract-

Fragrance ingredients are commonly added to many personal care products to provide a pleasant scent, including those intended for babies. While fragrance chemicals have a long history of safe use, at sufficiently high concentrations some may act as respiratory irritants or sensitizers. Little data have been reported on the inhalation exposures to fragrance compounds to infants and toddlers during bathing and lotion applications. To ensure the safety, they should be formulated with regard infections. Restrictions of products are regulated in each country so that the effectiveness and safety of products are guaranteed. In all types of products other fragrance allergens were frequently found. In conclusion, children are already exposed at an early age to well-known allergens, sometimes at concentrations which are considered to be unsafe. As contact allergy usually persists for life, manufacturers of children's cosmetics should be aware of their special responsibility and apply the highest possible safety standards.

Keywords: Children's, Fragrances, Health Hazards, Fragrance Free Products

I. Introduction-

Cosmetic is major cause of forming skin allergy due to fragrance in it. The aim of studies to see risk of hazardous fragrances in cosmetic used by children & people. By study there were 20 to 25% more people used Perfume than eau de perfume. The target content were fragrance allergens mixture of fragrance & chemicals. Alcohol was present at that exceeds recent guideline about safety of product used for children given by the government on the basis of industry. In conclusion, Due to lots of use cosmetic and its exposure may cause lots of disease. It considers to be unsafe. Special care should be taken during using such products.

The development of children's cosmetics aims hygiene products, cleansing and protection that require basic care such as functionality and efficiency(3). Security Strict standards are essential requiring the use of raw materials with a higher degree of chemical and bacteriological purity and smoothness(3). Therefore, dyes and fragrances must be kept at low levels as well as the concentration of the preservatives that must be low but must ensure low risk of microorganism contamination and proliferation. Another factor that cannot be overlooked is the characteristic of the children's products packing that must be carefully designed to minimize the risk of ingestion and also they must have valves that allow releasing small amounts of product and closing systems to "childproof".

The marketing concern is to develop packing with vibrant colours and children's characters in order to make packing with toy appearance calling, thus, the children's attention since these determine their choice of products. Most individuals with contact allergy to fragrance ingredients are aware that they cannot tolerate scented products on their skin and are often able to specifically name product categories that initiated their disease(2).

If exposure continues it may develop into a chronic condition with scaling and painful fissures of the skin. Allergic contact dermatitis to fragrance ingredients is most often caused by cosmetic products and usually involves the face and/or hands. It may affect fitness for work and the quality of life of the individual. Materials, whether aroma chemical, or natural product, frequently comprise 80% or more of the total number of ingredients in a fragrance. In the case of fine fragrances, they often contribute the major part of the total cost. Such ingredients are beyond the scope of this paper, but will be the subject of a future article.

II. History of perfume -

As previously noted, in Biblical times the ancients were fond of sweet perfumes of all kinds, and this characteristic is still especially true of the people of Bible lands. Perfumed oils were rubbed on the body and feet. At a feast in ancient Egypt a guest was anointed with scented oils, and a sweet-smelling water lily was placed in his hand or suspended on his forehead. In their religious worship the Egyptians were lavish with their incense. Small pellets of dried mixed spices and resins or resinous woods were burned in special censers. In the preparation of bodies for burial, perfumed oils and spices were used(9). Ancient texts and archaeological excavations show the use of perfumes in some of the earliest human civilizations. Perfume was refined by the Romans, the Persians and the Arabs(9).

Although perfume and perfumery also existed in East Asia, much of its fragrances were incense based. The basic ingredients and methods of making perfumes were described by Pliny the Elder in his *Naturalis Historian*(20).

India-

Perfume and perfumery also existed in Indus civilization (3300 BCE - 1300 BCE). One of the earliest distillations of Attar was mentioned in the Hindu Ayurvedic text Charaka Samhita and Sushruta Samhita. According to a 1975 report, an archeologist named Dr Paolo Rovesti found a terra-cotta distillation apparatus in the Indus valley together with oil containers made of the same material, and carbon dating puts this at 3000 B.C., much earlier than it is conventionally believed that distillation became practiced for the isolation of essential oils. Terra cotta vessels with plugged orifices of woven materials were used so that when fragrant plant materials were covered with boiling water the vapors impregnated the material, which was subsequently wrung out to isolate the oil. The perfume references are part of a larger text called BrihatSamhita written by Varahamihira, an Indian astronomer, mathematician and astrologer who lived in the historic city of Ujjain. He was one of the 'nine jewels' in the court of the Maharaja of Malwa. The perfume portion mainly deals with the manufacture of perfumes to benefit 'royal personages and inmates of harems'. The text is written as Sanskrit slokas with commentary by a 10th Century Indian commentator Utpala. In India perfumes and scented articles were in use from pre Vedic and Vedic periods for religious practices (10)

III. Perfumer-

A perfumer is a term used for an expert on creating perfume compositions, sometimes referred to affectionately as a Nose (French: le nez) due to their fine sense of smell and skill in producing olfactory compositions. The perfumer is effectively an artist (1) who is trained in depth on the concepts of fragrance aesthetics and who is capable of conveying abstract concepts and moods with fragrance compositions. At the most rudimentary level, a perfumer must have a keen knowledge of a large variety of fragrance ingredients and their smells, and be able to distinguish each of the fragrance ingredients whether alone or in combination with other fragrances. As well, they must know how each ingredient reveals itself through time with other ingredients. The job of the perfumer is very similar to that of flavourists, who compose smells and flavourants for many commercial food products. The practice of perfume-making has recently attracted academic interest among major research funding agencies(11).



Figure 1- Perfumer

IV. Fragrance Concentration-

A fragrance concentration refers to the strength that a fragrance has. Perfumes with a higher fragrance concentration contain more perfume oils and less alcohol. Fragrance concentrations are broken into categories including parfum, eau de parfum, eau de toilette, eau de cologne, and eau fraiche:

➤ Perfume-

Parfum, also known as extrait de parfum or pure perfume, has the highest fragrance concentration. Parfum contains from 15% to 40% fragrance however, concentration is generally between 20% to 30% for most parfums. Of all scents, parfums last the longest; usually six to eight hours. Parfum generally also commands the highest price of all the fragrance types due to the high concentration of fragrance. People with sensitive skin may do better with parfums as they have far less alcohol than other fragrance types and therefore are not as likely to dry out the skin(9-12).

➤ Eau De Parfum-

After parfum, eau de parfum has the next highest concentration of fragrance. Eau de parfum generally has a fragrance concentration of between 15% and 20%. On average, the scent of eau de parfume. will last for four to five hours(4). It is generally less expensive than parfum and while it does have a higher concentration of alcohol than parfum, it is better for sensitive skin than other fragrance types. Eau de parfum is one of the most common fragrance types and is suitable for everyday wear(18).

➤ Eau De Toilette-

Eau de toilette has a fragrance concentration of between 5% and 15%. It is cheaper than eau de parfum and is one of the most popular types of fragrance available. Eau de toilette fragrance normally lasts for two to three hours(4). Eau de toilette is considered by some to be for daywear while eau de parfum is considered nightwear. The term eau de toilette came from the French term "faire sa toilette" which means getting ready(7).

➤ Eau De Cologne-

Eau de cologne has a much lower concentration of fragrance than the above types of perfume, generally a 2% to 4% percent concentration of fragrance and a high concentration of alcohol(18). It is cheaper than other types of fragrance however, the scent generally lasts for up to two hours. Eau de cologne generally comes in bigger(4). bottles and more of the fragrance needs to be used. Originally eau de cologne referred to a traditional recipe that used herb and citrus notes(7).

➤ Eau Fraiche-

Eau fraiche is similar to eau de cologne in that the scent generally lasts for up to two hours. Eau fraiche has an even lower concentration of fragrance than eau de cologne, normally only 1% to 3%(4). While eau fraiche has a low fragrance concentration, it does not contain a high amount of alcohol. Along with the fragrance, the remainder of eau fraiche is mostly water(7-8). Along with the types of perfume listed above, there are mists, aftershaves, and other types of fragrances available. Higher end fragrances can cost a significant amount of money so doing research beforehand will ensure that he/she gets the type of fragrance he/she is looking for. Along with fragrance types there are also fragrance notes which determine the final scent. With all of the types and scents available, shopping for perfume is not always easy but it is possible(8).

➤ Baby Cologne-

Baby cologne is a specially formulated baby perfume that is used to make a baby smell good. Such baby scents are not essential for maintaining hygiene, but many people use them as they like to have their babies smell nice and fresh. On the other hand, some people find it unacceptable to use a perfume for a baby and cover up the natural baby smell. It is really a personal parental choice whether or not one should use a cologne for their child. The cologne products for babies are usually tested to make sure that they are non-toxic(16).

Many colognes for babies have a gentle, delicate fragrance of flowers and citrus fruits. The baby cologne also seems to be popular with grown-ups for their own personal use. The scent is fresh and not overwhelming, and does not smell too evidently of a baby product. The cologne can be used in everyday situations without drawing too much overt attention towards the wearer(16-17).



Figure 2- Baby Cologne

V. Overview of skin of toddlers or children's –

The adult skin is very different than the toddlers skin it has a characteristics different than each other. The immaturity of the epidermal barrier in preterm infants the skin very much delicate, sensitive and higher the permeability range. The infant skin has different characteristics compared to an Adult(3)

In preterm infants (24-30 weeks of gestation) the skin is very sensitive and has high permeability due the immaturity of the epidermal barrier. Stratum corneum is the superficial layer of the epidermis that resides the skin barrier function(3). This layer is thinner and hydrated that in adult but the higher rate of absorption and desorption causes higher epidermal water loss that induces the dehydration. In full term infants (40 weeks gestational age) the epidermal barrier is competent. But the skin layers still continue the maturation until one year old. Despite differences in skin structure, infants and children have a high risk for percutaneous toxicity(12-13-14-15).

Regarding the skin appendages, the sebaceous glands have high secretion rate in the first months of life due to the influence of maternal hormones and then remain inactive until puberty. The sweat glands become active in the third week of life and only when the autonomous nervous system is completely developed, they have adequate function. The thermal control function is impaired because the endocrine glands have no permanent activity(5). In addition, the immune system is not entirely effective and its function only reaches maturity around the age of nine years old(5).

The acid pH of the skin is a protective factor for patho-genic bacteria and helps to maintain the integrity and cohesion of the stratum corneum. In the newborn the pH is close to neutral and stabilizes in the first month of the baby's life until reaching values near the adult ones. Only from 2 or 3 years old the skin is replaced by the same adult skin characteristics fully exerting the barrier function between the external and the internal environment(13-14-15).

VI. Exposure-

Fragrance mix ingredients are commonly present in cosmetic formulations. Cosmetics based on natural ingredients may contain fragrance allergens at a higher concentration than other cosmetic products(4).

The clinical significance of exposure to natural extracts is difficult to determine as there is often "hidden and variable" exposure to important and potent allergens in natural products(6).

Children's products may contain fragrance allergens and high levels may be present. It has been stated that children may become sensitised to fragrance chemicals used by their mothers.

When we look at the risk of a product or exposure, we need to think about the dose, the type of exposure, and the scientific plausibility of harm before we decide how likely it is to pose a significant risk to babies. When we look at the risk of a product or exposure, we need to think about the dose, the type of exposure, and the scientific plausibility of harm before we decide how likely it is to pose a significant risk to babies. Perfume is worn by the parent, and so only very small amounts of it will be transferred by inhalation or through a baby's skin(1).

The risky exposure is when phthalate-containing products are used directly on baby's skin or in-utero exposure from mom using phthalate-containing products."



Figure 3- Baby Condition after Exposure of Hazardous Fragrances

Across all types of exposures, the percentages of individuals adversely affected are higher for vulnerable sub-populations(7). Practical implications of the results are compelling. For instance, more than one-fourth of asthmatic individuals and one-half of autistic individuals are prevented from using public restrooms that have air fresheners. Although washing hands with soap is intended to reduce health risks, individuals may be prevented from washing hands with soap due to health risks associated with fragrance in the soap(11). Further, a store using an air freshener or fragranced product may actually turn away rather than attract customers(8).

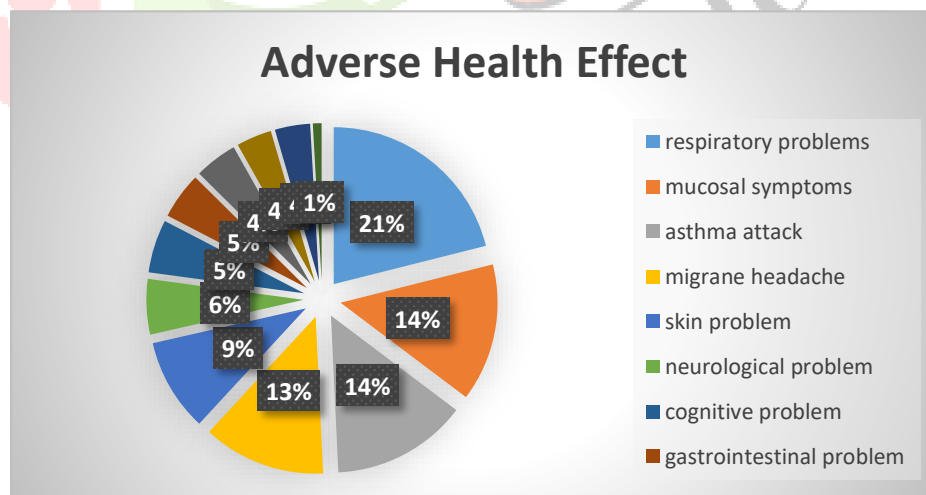
These exposure data, when combined with inhalation toxicities of fragrance compounds along with the exposure duration, can be used to screen for potential health hazards from fragrances added into consumer baby products and in developing risk assessments. The exposures associated with these uses should be considered in the estimate of aggregate and cumulative infant and toddler exposures from the variety of products that contain fragrance compounds(6). As with any personal care product, a complete exposure and risk assessment should be done to evaluate the overall safety of new ingredients added to personal care products, especially within regard to infants, toddlers and children(6).

VII. Health problems-

Across the general population and each of the vulnerable sub-populations, the most frequently reported adverse health effects are respiratory problems, mucosal symptoms, migraine headaches, skin problems, and asthma attacks. For each type of health problem, the frequencies are higher for vulnerable sub-populations (19).

For instance, respiratory problems are reported by 37.7% of asthmatic individuals and 44.7% of autistic individuals when exposed to fragranced products, compared with 16.7% of the general population(18).

For vulnerable sub-populations, the frequencies of the types of adverse health effects (% relative to that sub-population) include the following:



Adverse Health Effect- respiratory problems (37.7%), mucosal symptoms (25.4%), asthma attacks (25.0%), migraine headaches (22.6%), skin problems (17.1%), neurological problems (10.2%), cognitive problems (9.8%), gastrointestinal problems (8.6%), cardiovascular problems (7.9%), immune system problems (6.5%), musculoskeletal problems (6.5%), other (1.6%)(19).

VIII. Fragrance-free products-

Fragrance-free products can offer similar functionality but without the potential issues associated with fragranced products. For instance, a cleaning or disinfection product may be similarly effective at its primary function without the added fragrance(8). Further, changes from fragranced to fragrance-free products can reduce terpenes emissions in a relatively short time period(7). For instance, changing from fragranced to fragrance-free laundry products can reduce concentrations of fragrance chemicals (i.e., limonene) emitted from dryer vents by up to 99% within 4 weeks(18).

While the term “fragrance-free products” is not intended to imply emissions-free products, they do offer an option for consumer product functionality without the fragrance compounds. In addition, removing or discontinuing use of fragrance products can also reduce emissions and exposures(18). For instance, removing or turning off air fresheners in a restroom can reduce concentrations of fragrance chemicals within indoor environments by up to 96% within 2 weeks(7). Because fragrance molecules can adhere to surfaces during product use and be re-emitted later, even without the product in use, reduction may not be 100% immediately, but fragrance compound concentrations can decrease with time(18).

Moreover, the fact that fragranced products can constitute a barrier to participation in society can come under the auspices of disability legislation(7). The change to a fragrance-free product, the removal of the fragranced product, or a modification in facilities or operations to mitigate fragrance exposure, for instance, could be considered forms of reasonable accommodation. To this end, fragrance-free practices and policies have been implemented across the countries to accommodate sensitive and vulnerable individuals, as well as to reduce potential health risks and create a more healthful indoor air environment for all(8).

IX. Natural Perfumes Agents-

List of some natural excipients used as Natural Perfumes Agents.

Synod	Name of excipients	Source (Plants)	Family
1.	Lemon	Peel of Citrus lemon	Rosacea
2.	Orange	Peel of Citrus silences	Rosacea
3.	Raspberry	Fruit of Rubusrosi folius	Rosaceae
4.	Peppermint	Leaf of Menthas picata	Lamiaceae
5.	Ginger	Roots of Zingiber officinale	Zingiberaceae
6.	Sandal wood oil	Heartwood of Santalum album	Santalaceae
7.	Ajowan	Trachyspermum ammi	Apiaceae
8.	Anise oil	Pimpinella anisum	Apiaceae
9.	Balsam of Peru	Myroxylon balsamum	Fabaceae
10.	Bay oil	Cinnamomum tamala	Lauraceae
11.	Cardamom oil	Elettaria cardamomum	Zingiberaceae
12.	Citronella grass	Cymbopogon nardus	Poaceae
13.	Clove oil	Syzygium aromaticum	Myrtaceae
14.	Davana oil	Artemisia pallens	Asteraceae
15.	Lavender oil	Lavandula latifolia	Lamiaceae

FLOWER PERFUMES

Rose, Jasmin, Neroli, Violet, Acacia, Broom, Carnation, Cyclamen, Fougere (Fern), Gardenia, Hawthorn, Heliotrope, Honeysuckle, Hyacinth etc.

X. Discussion -

It has been shown that children from 0-8 years can be sensitized when exposed to a strong allergen under normal circumstances, the risk of sensitization and later elicitation will depend on the nature and quantity of exposure to allergens. In 1981, Hjorth found that contact allergy was less frequent in children than adults, which led him to believe that this was caused by the reduced prevalence of cosmetic allergy in children, and he stated: although small girls love cosmetics, they rarely have access to them'. Since then the situation has changed: cosmetic products, specially formulated for children, are marketed and used by/on an increasing number of younger children, e.g. perfumes are now available for babies. However, a child cannot be expected to follow complicated instructions and failure to respect these would mean a significant risk of sensitization. In addition, spills may occur.

The products sold to the consumer as toys and/or cosmetics must be safe as marketed. Exposure to fragrance allergens in cosmetic products and toys starting at an early age of childhood may lead to sensitization and onset of clinical contact dermatitis. Well-known fragrance allergens are used in cosmetic products intended for children. Although it appeared that more care was taken in the formulation of these products compared with the corresponding products or adult population, the contents of well-established fragrance allergens in some products. Both cosmetics and toy-cosmetics, exceeded the current industry standards for safe products; and this would pose a significant risk to the infant and child population. A major concern in general is the early start and multiplicity of exposures to many allergens in cosmetic/toy products as shown in this study.

XI. Conclusion-

The children's products must be safe and effective for specific ages as the child's skin has a higher degree of permeation and penetration of substances. The laws and post-marketing in the countries must be rigorous and specific to this new market category. It is necessary to be careful to choose the formulation ingredients and the labelling in order to reach the safety of use. A simulated approach was developed to assess the air concentrations in infants' and toddlers' breathing zones for fragrances added to baby bath additives and baby lotions. An infant's breathing zone air concentrations associated with the use of a baby bath product or baby skin lotion were highly approachable. However, the widespread use of fragrances in consumer products can result in multiple exposures to infants and toddlers throughout the day. As with any personal care product, a complete exposure and risk assessment should be done to evaluate its overall safety in common uses. The method developed can provide guidance for: 1) refining infant's and toddler's inhalation exposure estimates used in risk estimates of baby product components and 2) future safety assessments of new products designed for use on infants and toddlers.

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