Our Dermatology Online

Original Article

Use and dermatologic complications of cosmetic products in black children: A cross-sectional study in sub-Saharan Africa

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ABSTRACT

Background: Children are exposed to cosmetics from birth through parental practices, yet these products may cause dermatologic complications. Despite widespread use in sub-Saharan Africa, data remains scarce. This study aimed to describe the sociodemographic profile of black children using cosmetics, identify their cosmetic practices, and document dermatologic complications associated with cosmetic product use in this population. **Methods:** This descriptive, cross-sectional study was conducted from August to September 2020 at the dermatology and pediatric departments of Treichville University Hospital. Children aged 0–14 using cosmetics were consecutively recruited during consultations. Parents completed a standardized questionnaire, and physicians performed dermatologic examinations. Data was analyzed using Epi-Data and Access, with statistical significance at $p < 0.05$, following ethical approval. **Results:** Among 1,020 children consulted, 285 used cosmetic products, giving a prevalence of 27.9%. The children's age ranged from 1 day to 14 years, with a mean age of 0.4 years; 40.7% were under one year of age, and 52% were male. Most (80%) lived with both parents. Soap (98.6%), body lotion (95.1%), and perfume (66.7%) were the most frequently used products. Cosmetics were mainly purchased in markets and supermarkets. Shea butter was commonly applied as a body ointment. Complications occurred in 11.23% of the children, mostly due to perfumes and powders. Scabies and acne were the most frequent dermatoses, with a significant association between cosmetic use and lesion onset. **Conclusion:** Cosmetic products are widely used by children. The most commonly used products were soap, body lotion, and perfume. Most of the products were purchased at the market or supermarket. Dermatological complications were reported by the parents. The most common dermatological complaints were rashes and pruritus, with an average duration of four months. The most common diagnoses were scabies and acne.

Key words: Children, Cosmetics, Skin manifestations, Sub-saharan Africa

INTRODUCTION

Children's use of cosmetics is a special case, with the development of what is known as infant cosmetics. It is significant to note that, from birth, children often use cosmetics through the habits of their parents, particularly their mothers. In France between 2013 and 2016, the cosmetics most commonly used by children were shampoo (70%), washing gel (67%), seat wipes (67%), moisturizer (28%), and sun cream (50%) [1,2]. In Togo, nearly 90% of mothers used cosmetic products on their children from birth [3]. The harmful effects of children's cosmetics may be a source of numerous complications [4-6]. According to Rance et al., out of 202 children, 2.4% had contact allergies due to emollients made from oat extract [4].

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In Côte d'Ivoire, there is a paucity of data on the use of cosmetic products in children and their possible complications. It, therefore, seemed appropriate to conduct this study on the use of cosmetic products in children and their medical complications, particularly dermatological. The aim of this study were to describe the socio-demographic profile of black children using cosmetics, to determine the cosmetic practices of black African children, and to describe the dermatological complications associated with the use of cosmetic products in black African children.

METHODS

Study Design

This was a descriptive, cross-sectional study.

Setting

It took place from August 1 to September 30, 2020, at the dermatology and pediatric departments of Treichville University Hospital.

Participants

Our study population consisted of children seen for consultations at the pediatric and dermatology departments.

Inclusion criteria

Included were children:

- Between the ages of 0 and 14 seen during consultations at the dermatology and pediatric departments;
- Who used cosmetic products;
- Whose parents gave their free and informed consent to participate in the study.

Exclusion criteria

Children who were hospitalized at the dermatology and medical pediatrics departments.

Variables

Our survey took place at the dermatology and pediatric consultation departments. The survey was conducted by us from Monday to Friday between 07:30 and 12:00. During the survey, we interviewed the parents using a questionnaire. Dermatological examinations were then conducted by dermatologists and pediatricians in order to identify and treat dermatological complications.

Data Sources/measurement

Data was collected using a survey form that was sent to parents to answer questions about their children's cosmetic habits. The survey form was standardized, structured, and anonymized. Composed of four parts, it was validated after a pre-test on ten people. It was used to collect data on qualitative variables (sociodemographic, practical, and clinical) and quantitative variables (sociodemographic, practical, and clinical).

Study Size

The sample size was determined by the following formula using the simple random titration method: $n = t^2p\ (1 - p)/m^2$ giving a sample size of 139 cases.

Sampling Method

The subjects of the study were recruited using a non-probabilistic, accidental, and convenience sampling technique, i.e., the children were selected as and when they presented themselves at the various departments planned for the survey, without sorting for reasons of feasibility and accessibility.

Quantitative Variables

Quantitative variables as means were expressed with standard deviations and extreme values.

Statistical Methods

Word and Excel, version 2016, were used for data entry and recording.

The results were analyzed using EPI-DATA V3.1 and Access software.

The chi-squared and Fisher tests were used for univariate and bivariate analyses.

For all statistical tests, the significance level (p) was at 0.05.

Ethical Considerations and Confidentiality

An informed consent form was sent to the parents. All information and photos relating to the participants were kept anonymous and confidential. The computer processing was not nominative.

In terms of deontology and ethics, authorization to investigate at the dermatology and pediatrics departments was granted to us by the Medical and Scientific Director of the University and Hospital Centre of Treichville, representing the head of the Ethics Committee at the University and Hospital Centre of Treichville.

RESULTS

Initially, the minimum size of our sample was 139 children, distributed as follows: 93 at the pediatrics department and 46 at the dermatology department. However, during the course of our survey, which was conducted over a period of one month, we were able to collect a sample of 285 children (215 at pediatrics and 70 at dermatology) who used cosmetic products.

Socio-demographic Characteristics of Children

The children included in our study ranged in age from 1 day to 14 years, with an average age of 0.4 years. Children aged between 1 day and 1 year were the most numerous (40.7%). Males predominated (52%), and 80% of the subjects lived with both parents.

The children included in our study had no previous history of asthma in 79.3% (226) of cases. Those with a specific history accounted for 20.7% of the children, and this was either chronic rhinitis in 19.6% (56) of cases or asthma in 3 cases (1.1%).

Use of Cosmetic Products

During the study period, we identified 285 (215 at pediatrics and 70 at dermatology) children who used cosmetic products out of 1020 children seen in consultation, giving a prevalence of cosmetic use of 27.9%. The advice of a health professional was required before using soap in 93% of cases, body ointment in 38.6%, shampoo in 14.4%, perfume in 9.5%, hair ointment in 7%, and powder in 2.1%.

The cosmetic products that the parents frequently used with their children were soap (98.6%), body lotion (95.1%), perfume (66.7%), powder (16.1%), shampoo (13%), and hair lotion (10.9%). A sponge was used by 94% of the children. Shea butter was used as a hair ointment by 7.71%, while it was used as a body ointment by 65.5%. Markets and supermarkets were the main places where parents bought cosmetics for their children. The parents bought 66% of body pomades, 43.6% of shampoos and hair pomades, 39% of powders, 35% of perfumes, and 27% of soaps at the market.

Supermarkets accounted for 60% of the parents' perfume purchases, 54% for powder, 52% for soap, and 16% for body ointment. The average purchase cost of shampoo or hair pomade was 1314 francs CFA. The average cost of a body ointment was 1848 francs CFA. The average cost of a perfume was 1647 francs CFA. Powder cost 1793 francs CFA.

Skin Complications

Complications were found in 32 children, giving a prevalence of 11.23% (32/285). Complications were attributed to soap in one case (0.35%), to perfumes in 18 cases (6.35%), and to powders in 13 cases (4.53%). Children (3.1%) developed rhinitis (4.2%) and skin allergy (2.16%) after using a cosmetic product.

These children were seen in consultation for a non-dermatological reason in 210 cases (73.5%) and a dermatological reason in 73 cases (25.2%). The most frequent dermatoses were scabies (21 cases) and acne (14 cases) (Table 1) (Figs. 1a – 1c). There was a statistically significant relationship between the appearance of lesions, the diagnosis made and the use of children's cosmetics ($p < 0.05$) (Table 2).

DISCUSSION

In our study, 52% of the cases were male, giving a sex ratio of 1.09. This result is contrary to that of Kourouma

Table 1: Distribution of the 285 children participating in the study on the use and complications of cosmetic products in sub-Saharan Africa, according to the dermatoses observed

Dermatoses	Diagnoses	Number	Proportion (%)
Infectious dermatoses	Scabies	21	7.35
	Pityriasis versicolor	6	2.10
	Pustulosis	1	0.35
	Moth	1	0.35
	Molluscum contagiosum	1	0.35
	Folliculitis	1	0.35
	Creeping dermatitis of the hand	1	0.35
Allergic and inflammatory dermatoses	Acne	14	4.91
	Prurigo	10	3.50
	Atopic dermatitis	7	2.45
	Seborrheic dermatitis	4	1.40
	Eczema	4	1.40
Other dermatoses	Fibrous tumor of the scalp and limbs	2	0.7
	Keratosis pilaris	1	0.35
	Tufted angioma	1	0.35

Figure 1: (a) Allergic contact dermatitis in a child. (b) Scabies nodule on the back of an infant. (c) Tinea corporis in a child.

Table 2: Associations between the appearance of skin lesions, diagnosis, and cosmetic practices in the children

Cosmetic practices / Complications dermatological	Good n (%)	Poor n (%)	p-value
Lesion			
Yes	35 (56.5)	163 (73.1)	0.0118
No	27 (43.5)	60 (2.9)	
Diagnosis			
Yes	24 (38.7)	53 (23.7)	0.0191
No	38 (61.3)	170 (76.3)	

et al., who noted a predominance of girls (54.06%), with a sex ratio (F/H) of 1.17 [5].

Our study showed that 98.6% of the parents used soap regularly (twice a day) with their children. Most of these soaps were Marseille soap, generally bought in supermarkets by mothers or grandmothers at prices ranging from 100 francs CFA to 1.000 francs CFA. This may be explained by the fact that soap is a basic product for personal hygiene, especially for children. Mothers who already receive advice from their friends or relatives simply copy these practices [2]. Dermatologists often recommend the use of Marseille soaps because they comply with recommended standards.

Like soap, almost all our respondents used body ointment on their children. Shea butter was used by more than half (65.49%). This purely natural product has been used by mothers for many years because of its therapeutic properties, but above all because of tradition. Its use is, therefore, handed down from generation to generation and may be obtained easily at a low cost (100–1,000 francs CFA).

The parents used perfumes on their children in 66.7% of the cases, and most of them bought them in supermarkets at affordable prices. Our results are superimposed on those by Marie et al, where supermarkets were the main source of cosmetics for children (46.2%). Soaps and toilet milks were the most commonly used cosmetics, as were talcs in 25.7% and perfumes in 38.8% [3]. In contrast, Ficheux et al. found that the most commonly used cosmetics were shampoo (70%), washing gel (67%), seat wipes (67%), moisturizer (28%), and sun cream (50%) [1]. This difference in proportions could be explained by the frequency of use and the number of products, which stands at five.

It was noted that 4.2% of the children developed rhinitis after using the product, and 2.16% developed a skin allergy. These results show that certain cosmetic products are highly allergenic and may, therefore, cause skin reactions, especially in atopic subjects [4,6-9]. Ficheux et al. agreed, stating that many mothers (88.9%) used at least one cosmetic product containing at least one allergen; the most common allergens were preservatives (49.7%) and fragrances (32.9%) [1]. Our results are also similar to those by Rance et al. in France, who reported that 2.4% of contact allergies were due to emollients made from oat extract [4].

This finding of an allergic reaction is also reported when a powder is used on children. Our study shows that contact eczema and rhinitis occur in 2.5% and 1% of the cases, respectively. The composition of children's powder requires several chemical substances, some of which are allergenic [2,6,7,9-12].

Our study showed that some products were also used less frequently than others, such as shampoos. The use of this product is infrequent because of its cost, and it is not part of parents' traditional habits compared to other products.

In order to highlight dermatological complications in children, we found it essential to look for certain correlations between the different variables studied. There was a statistically significant relationship between the appearance of lesions and the use of children's cosmetics ($p = 0.0118$). Cosmetics are applied to the body. This is why many people think that cosmetics, being minimally invasive, are apparently harmless. However, some substances cross the skin barrier or are metabolized and absorbed into the systemic circulation. Skin penetration sometimes determines the efficacy of cosmetics, yet always their toxicity. This toxicity may lead to pathologies that can create a morbid state or, worse yet, mortality in children [6,7,11,13-15].

This is also explained by the fact that there is a statistically significant relationship between diagnosis and the use of children's cosmetics (p = 0.0191). It is important to know the fate of chemical substances applied to the skin in order to assess the extent of the dose actually absorbed and available for systemic pharmacological or toxic activity [9,16]. Contact allergies to cosmetic products are highly common and include eczema. These allergies are most often due to the fragrances contained in cosmetic products, followed by preservatives and emulsifiers [6-8,11].

CONCLUSION

Cosmetic products are widely used by children. The most commonly used products were soap, body lotion, and perfume. Most of the products were purchased at the market or supermarket. Dermatological complications were reported by the parents. The most common dermatological complaints were rashes and pruritus, with an average duration of four months. The most common diagnoses were scabies and acne.

Statement of Human and Animal Rights

All the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the 2008 revision of the Declaration of Helsinki of 1975.

Statement of Informed Consent

Informed consent for participation in this study was obtained from all patients.

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