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Impact of Maternal Skincare Products on Breast Milk Safety

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ABSTRACT

Breast milk is widely acknowledged as the most appropriate and complete source of nutrition for infants, providing essential nutrients, immune protection, and bioactive components necessary for optimal early development. During the postpartum period, increased use of skincare and cosmetic products is common due to hormonal changes, dermatological conditions, and aesthetic concerns. Many topical formulations contain chemical substances such as preservatives, fragrances, antimicrobial agents, and hormonally active compounds that may penetrate the skin barrier and enter systemic circulation. This raises concerns regarding their potential transfer into breast milk and subsequent infant exposure. This review critically analyzes current scientific evidence on the safety of maternal skincare product use during lactation, focusing on dermal absorption, pharmacokinetics, breast milk transfer, and potential infant health implications. Although most topical products are considered safe when used appropriately, ingredients such as parabens, phthalates, retinoids, and triclosan warrant cautious use. Improving awareness among healthcare professionals and breastfeeding mothers is essential to support informed skincare choices and safeguard infant health.

Keywords: Breastfeeding; Skincare products; Breast milk safety; Lactation; Dermal absorption; Infant exposure

I. INTRODUCTION

Breastfeeding plays a fundamental role in infant nutrition, immune defense, and long-term health outcomes. Exclusive breastfeeding for the first six months of life is strongly recommended by global health authorities, highlighting the importance of maternal factors that may influence breast milk composition. The postpartum period is frequently associated with hormonal fluctuations, increased skin sensitivity, pigmentation changes, acne, and dryness, which often result in greater use of skincare and cosmetic products.

Although the skin functions as a protective barrier, it is not completely impermeable. Certain topical substances may penetrate the stratum corneum, reach systemic circulation, and potentially be excreted into breast milk. Considering the immaturity of infant metabolic and detoxification systems, even low-level exposure to biologically active compounds may pose potential health risks. This review examines the relationship between maternal skincare product use and breast milk safety, highlighting ingredients of concern and evidence-based recommendations for lactating mothers.

II. DERMAL ABSORPTION AND PHARMACOKINETICS

Dermal absorption of skincare ingredients is influenced by factors such as molecular weight, lipophilicity, formulation type, frequency and duration of application, and integrity of the skin barrier. Lipophilic compounds demonstrate greater penetration potential and may accumulate in adipose tissue. Due to its high lipid content, breast milk may serve as a reservoir for such substances.

While systemic absorption of most cosmetic ingredients is generally minimal, prolonged use or application over large body surface areas may increase bioavailability. In addition, damaged or inflamed skin and occlusive conditions may enhance penetration, raising concerns about sustained maternal exposure during lactation.

III. COMMON SKINCARE INGREDIENTS OF CONCERN

3.1 Parabens

Parabens are widely used preservatives with antimicrobial properties. Despite their low acute

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toxicity, they exhibit weak estrogenic activity. Several studies have detected parabens in maternal biological samples, including urine, serum, and breast milk, indicating systemic absorption. Long-term exposure has raised concerns regarding endocrine disruption and potential effects on infant hormonal development.

3.2 Phthalates

Phthalates are commonly used as fragrance stabilizers in cosmetic products. These compounds are well-recognized endocrine disruptors and have been associated with adverse reproductive and neurodevelopmental outcomes. Detection of phthalate metabolites in breast milk suggests potential infant exposure during lactation.

3.3 Retinoids

Topical retinoids are frequently used for acne management and anti-aging purposes. Although systemic absorption is relatively low, retinoids are generally used with caution during lactation due to their known teratogenic potential and limited safety data regarding breast milk transfer.

3.4 Triclosan

Triclosan is an antimicrobial agent previously incorporated into various personal care products. Evidence suggests that triclosan may interfere with thyroid hormone regulation. Trace concentrations have been detected in breast milk, raising concerns regarding possible endocrine effects in infants.

3.5 Nanoparticles

Nanoparticles such as zinc oxide and titanium dioxide are commonly used in sunscreen formulations. Current evidence indicates minimal dermal penetration; however, long-term safety data regarding infant exposure through breast milk remain limited, necessitating cautious use.

IV. TRANSFER OF SKINCARE INGREDIENTS INTO BREAST MILK

The transfer of chemical substances into breast milk is influenced by molecular size, lipid solubility, protein binding, and maternal plasma concentration. Most skincare ingredients exhibit low milk-to-plasma ratios, suggesting minimal transfer. However, lipophilic and hormonally active compounds may accumulate with repeated exposure. Infant exposure is further influenced by feeding frequency, milk fat content, and duration of breastfeeding.

V. INFANT HEALTH IMPLICATIONS

Although acute toxicity related to maternal skincare product use is uncommon, the possibility of subtle long-term effects cannot be completely excluded. Infants possess immature hepatic and renal detoxification mechanisms, which may increase susceptibility to endocrine-disrupting chemicals. Chronic low-dose exposure may influence growth, neurodevelopment, and hormonal regulation, emphasizing the importance of preventive strategies during lactation.

VI. RECOMMENDATIONS FOR LACTATING MOTHERS

- Prefer fragrance-free and preservative-minimal formulations
- Avoid topical retinoids and antimicrobial agents such as triclosan
- Limit frequency and quantity of product application
- Avoid applying products on or near the nipple and areola
- Choose products labeled as safe during lactation
- Seek professional medical advice for dermatological conditions

VII. ROLE OF HEALTHCARE PROFESSIONALS

Healthcare professionals play a crucial role in educating and counseling lactating mothers regarding safe skincare practices. Physicians, dermatologists, and pharmacists should be familiar with ingredient safety profiles and provide individualized guidance to minimize infant exposure while addressing maternal dermatological needs.

VIII. CONCLUSION

Maternal use of skincare products during lactation is generally safe when products are selected carefully and used in moderation. Awareness of potentially harmful ingredients and adherence to evidence-based recommendations can significantly reduce infant exposure through breast milk. Further research is required to clarify the long-term effects

of chronic low-dose exposure to cosmetic ingredients during breastfeeding.

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