

Skin characteristics and care of the healthy full term newborns

Abstract

Newborn period refers to the first month of life. The skin of the healthy newborn has similar structural components as that of an adult but it differs in some characteristics from adult skin. The adaptation to external environment and maturation takes time. During this period special care and attention should be provided in order to promote skin health and prevent diseases of not only skin but also other systems such as respiratory system (atopic march).

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Introduction

Newborn period refers to the first month of life. Newborns can be full term (born between 37 and 42 weeks of estimated gestational age), pre term (born before the 37th gestational week) or post term (born after 42 weeks of gestation). The birth of the baby represents a sudden transition from intrauterine life to the external environment.¹

Functions of the skin

The skin has many functions essential for human survival such as modulation of trans epidermal water fluxes, protection from dehydration and excessive water influx and maintenance of electrolyte homeostasis, thermoregulation and minimization of caloric losses, tactile sensation, antimicrobial defense, protection from environmental toxins, trauma and ultraviolet radiation.²

Skin structure and development

Skin consists of epidermis, dermis and a subcutaneous layer. The epidermis is composed of not only keratinocytes but also melanocytes of neural crest origin, antigen-processing Langerhans cells of bone marrow origin and pressure-sensing Merkel cells of neural crest origin. While the dermis contains collagen, elastic fibers, blood vessels, sensory structures and fibroblasts, the subcutaneous layer is formed mainly by lipocytes.²⁻⁴ Skin is a dynamic organ that undergoes continuous changes throughout life. The definitive multilayered skin is present at birth and the skin is covered with a white, cheesy, lipophilic substance called vernix caseosa. The vast majority of premature infants lack this protective mantle. The vernix caseosa helps to maintain skin hydration at birth and potentially facilitates the formation of the acid mantle, a drop in skin pH that occurs within weeks after birth.⁵

Structural differences between newborn and adult skin

Although the skin of the healthy newborn has similar structural components to that of an adult, it differs in some characteristics. The number of cell layers (approximately 15-20) and overall thickness of the stratum corneum (approximately 15µm) are comparable in both age groups. The cohesion and adhesion of epidermal cells in newborn skin are not fully developed and thus the connection at the epidermal-

dermal junction is weaker than in adult skin. The skin surface area to weight ratio is higher in newborns (skin surface area of infant is 700cm²/kg as compared to adult skin which is 250cm²/kg). The melanin production is less and the pH of the skin surface is higher than adult skin.^{1,6}

Skin care of the newborn in general

Immediately after delivery, the full term newborn can simply be wiped or washed with water. Excessive vernix may be removed, but in general, is best left on the skin. Even if the vernix remains, latex free gloves should continue to be worn when handling the infant.^{6,7} The first bath should be delayed until after vital signs have been stable. Routine bathing may begin before the umbilical cord has fallen, but there may be advantages associated with waiting. Regular cleaning of the umbilical cord with 4% Chlorhexidine in the first 10 days of life until the cord falls has been shown to reduce greatly the risk of infection and the risk of neonatal death in Nepal and may be of benefit in areas where umbilical infection is common.⁸ When compared with cloth or sponge washing, bathing has been shown to have several advantages. The infants are generally calmer and quieter when bathed compared with cloth washing. Bathing is also associated with less heat loss than cloth washing. Bathing in the evening can help to calm the baby and improve sleep. Cloth washing during the first 4 weeks of life has been shown to be associated with increased trans epidermal water loss and reduced stratum corneum hydration compared with bathing. Cleansers are best avoided and lukewarm water baths are best in the first weeks of life.^{1,7-10}

In newborns, 5-10min is an adequate length of time for the bath, with some authors preferring bathing for even shorter periods. Prolonged bathing increases the hydration of the skin and reduces the threshold for friction. Water temperature should be 37-37.5 °C. Water depth should be to the infant's hips. A wash cloth may be used to cover or splash water onto the belly to maintain body heat. Room temperature should be 21-22 °C. Daily bathing is generally discouraged and bathing should be carried out 2-3 times per week.^{7,11-13} The bath and any bath toys should be disinfected to avoid microbiological contamination. Hard plastic toys should be scrubbed with warm soapy water using a brush to clean crevices, rinsed in clean water, immersed in a mild bleach solution, which should be made fresh daily, for 10-20 minutes, rinsed again, and allowed to air dry.

Alternatively, hard plastic toys can be washed in a dishwasher or hot cycle of a washing machine. Toys that cannot be washed, disinfected, or dry cleaned after use should be avoided.^{7,14} Cleansing agents should be liquid, mild, soap free, fragrance free, with neutral or slightly acidic pH; they should not irritate the skin or eyes of the baby nor change the protective acid mantle of the skin surface. The hair is short, thin and fragile, it is not necessary to use shampoos. The same products can be used for the body and hair.¹⁵

Diapers should be changed frequently and superabsorbent disposable diapers should be used. The hygiene of the diaper area with warm water and cotton without soap is sufficient for the daily cleaning of urine. For stools, mild pH-neutral soap or syndets (non-soap surfactants) is recommended. The routine use of topical preparations to prevent diaper dermatitis is not necessary for children with normal skin. Additives in these preparations have the potential to cause contact sensitization, irritation and/or percutaneous toxicity. Despite the fact that cleaning wipes are practical and have a pleasant smell, they are not recommended due to the risk of removing the lipid film of the skin and causing sensitization.^{6,13,15} Fragrance free, new generation cleaning wipes are useful in circumstances such as when travelling or short visits away from the home. Emollients are recommended in the daily care of dry skin, scaly dermatosis and atopic dermatosis. An emollient is more effective when it is applied immediately after bathing or to damp skin. Emollients with fragrance, preservatives, dyes and botanical ingredients should be used carefully due to irritating and sensitizing effects. Cream and lotions are easier to spread. Ointment use is discouraged in hot and extremely humid areas due to its occlusive effect. In contrast to common belief, olive oil as an emollient should be discouraged due to the negative effects on skin barrier function and its potential to promote dermatitis.^{15,16}

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Conflicts of interest

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