EVALUATION OF INGREDIENTS IN INFANT SKIN CARE PRODUCTS, WITH A FOCUS ON BABY WIPES

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EXECUTIVE SUMMARY

The characteristics of baby skin in the first year of life increase babies' susceptibility to potential irritants and dermatitis. The sheer choice of available skin care products can make it difficult for healthcare professionals (HCPs) to recommend specific products over others and for parents or carers to make informed decisions on how to safely cleanse their baby's skin at each nappy change.

In September 2020, an international, expert group of HCPs were brought together by WaterWipes® to consider best practice to support other HCPs, parents and caregivers to upskill in and deliver best practice on baby nappy area skin care. This article from our subgroup of advisers specialising in paediatrics, dermatology and paediatric dermatology aims to empower HCPs, parents and caregivers with evidence-based choices of baby wipes with recommendations on how to navigate terminology and ingredients on packaging.

Guidelines from professional bodies often use vague, poorly-defined terms such as 'mild' to delineate products that are suitable versus unsuitable for baby skin. They also unrealistically rely upon HCPs, parents and caregivers and caregivers being able to identify specific classes of ingredients to avoid from the multitude of potential additives in baby wipes. Further research also demonstrates that some of the potential irritants to baby skin that may be in skin care products are not specifically highlighted by guidelines.

Clinical trial data demonstrate that, the use of a baby wipe with the fewest possible ingredients (only purified water and grapefruit seed extract) is associated with lower incidences and a shorter duration of moderate-to-severe nappy rash compared with use of other baby wipes marketed.[27]

We therefore make the following key recommendation:

Use baby wipes containing purified water with the fewest possible added ingredients to maximise the avoidance of potential irritants.

INTRODUCTION

New parents are inundated with choice when it comes to buying products for their newborn and choosing skin care products such as baby wipes is no different. A baby's skin is an organ exposed to the environment that requires regular cleansing—and can therefore become a focus of worry for new parents. The American Academy of Pediatrics (AAP) highlights this in its guidance on newborn care stating, "Parents often have questions about skin and cord care".[1] Confusion over choosing skin care products for babies is further compounded by the plethora of unfamiliar ingredients that may feature on product packaging, as well as a lack of consistency and specificity of the recommendations in guidelines.[1–7]

In order to understand how to support HCPs, parents and other caregivers to upskill in and deliver best practice on baby nappy area skin care, WaterWipes convened a global advisory board of 17 experts from eight countries in September 2020. This article from our subgroup of advisers specialising in paediatrics, dermatology and paediatric dermatology aims to support HCPs and carers in understanding the ingredients in infant skin care products, with a focus on baby wipes, to feel empowered to make evidence-based choices.

THE NEED TO SUPPORT INFORMED CHOICES OF BABY SKIN CARE PRODUCTS

A baby's skin is perfectly suited to the intrauterine environment, but must continue to adapt over the first year of life to form an effective barrier against the outside world.[8,9] Barrier function resides primarily in the stratum corneum. In babies, the strength of this barrier is impaired by underdeveloped small corneocytes forming just a thin stratum corneum layer.[10] Transepidermal water loss (TEWL) is considered a surrogate marker for skin barrier function and may be high in infants compared with adults until they reach 12 months of age.[8,10]

An impaired barrier function leaves babies susceptible not only to water loss, but to increased absorption of topical agents, the effects of which can be further intensified by the high ratio of baby body surface area to body weight.[8,10] Furthermore, dryness and epidermal barrier dysfunction are characteristic of skin afflicted with atopic dermatitis (AD) and nappy rash.[10]

Dermatoses in babyhood are not only caused by the inherent properties of infant skin. The increasing prevalence of AD over at least the last two decades in countries such as the UK and US,[11,12] has led to an investigation into the importance of environmental factors and the realisation that intrinsic barrier dysfunction and inflammation can be worsened by ingredients in products used on the skin.[13,14,15] The usual age of onset of AD is 3 to 6 months, and nappy rash affects 25% of nappy-wearing infants at any one time.[2,13,16]

CONSIDERING THE LANGUAGE USED IN GUIDELINES

In our experience, confusion over differences between skin products and their ingredients is prevalent among HCPs and parents or carers alike owing to inconsistent use of terminology and the sheer ever-evolving range of potential additives. Guidelines developed by leading bodies throughout the world from the World Health Organization (WHO) to the UK's National Institute for Health and Care Excellence (NICE) to the AAP and The American Academy of Dermatology (AAD), do not shed light on this matter. [1–3,6,7] We believe that there should be better, more recent and more unified guidelines.

The guidelines lack granularity, describing only the general characteristics of suitable cleansing products in poorly-defined terms such as 'mild', 'non-perfumed', 'fragrance-free' and 'alcohol-free'.[1–3,6] 'Mild' is used in both UK and US guidelines to describe cosmetics suitable for baby skin.[1,3,5] Mildness is most commonly associated with the absence of skin irritation. However, there is no standard way to test this in the laboratory and therefore no consistent definition of 'mild' within the personal care industry.[17] In our experience, navigating product labels to choose those free from perfumes, fragrances and alcohol can be a challenge. Under US regulations, for example, 'alcohol' refers to ethyl alcohol and a cosmetic product labelled as 'alcohol-free' may contain other alcohols.[18] Similarly, manufacturers are permitted to use the term 'fragrance-free' on products that include fragrance chemicals if those chemicals have been used for another purpose (e.g. moisturising) rather than changing the product's scent.[19]

According to the guidelines, unsuitable products include those that are 'medicated' and those containing 'irritants'.[1-3,6] However, avoiding medical substances or drugs may not be as simple as it seems—discerning what each ingredient is in some baby wipes can be challenging when only the chemical names are given. Identifying irritants presents a challenge given the range of ingredients with the potential to irritate the skin.

THE ANATOMY OF BABY WIPES AND THE POTENTIAL FOR IRRITANT INGREDIENTS

If we disregard the packaging, disposable baby wipes will comprise of a base sheet (the cloth that makes the wipe) and the formulation (the water and ingredients dissolved in it that make the wipe wet and help with cleansing).[20] The formulations of baby wipes are where the key differences lie.

Even the quality of the water used has the potential to make an impact on how well-tolerated a baby wipe is, because water impurities have the potential to irritate baby skin.[21–23] This is demonstrated by the fact that hard water (i.e. water with increased levels of dissolved calcium and magnesium carbonate) has been associated with increased incidences of AD.[21–23] In a UK-based study of 1,204 babies, those exposed to harder water had more visible AD at 3 months of age than those exposed to softer water (P=0.005).[23]

The fragrances and alcohol highlighted for avoidance by the guidelines are not the only potential added ingredients in cosmetics with the potential to be irritants.[2,6] Surfactants, for example, are added to many baby wipe formulations to decrease surface tension, allowing fat-soluble impurities to be removed from the skin surface.[16] The interaction of cleanser surfactants with stratum corneum proteins and lipids can provoke skin scaling, dryness, tightness, roughness, erythema and swelling.[16,24]

CLINICAL DATA EXAMINING THE TOLERABILITY OF BABY WIPES

Historically, cotton wool or cloth and water were considered to be the gentlest and best-tolerated ways to clean nappy areas of babies and are still recommended by some guidelines to this day.[4,7] However, clinical studies and our own experience support the idea that baby wipes are a more convenient alternative for modern parents, particularly outside the home.[25] In 2012, a landmark study further validated the shift to baby wipes, demonstrating them to be equivalent to cotton wool and water in terms of skin hydration, skin surface pH, TEWL, and erythema.[26]

In 2020, the Baby Skin Integrity Comparison Survey (BaSICS) was the first study to directly compare different wipe formulations to identify differences in the incidences of nappy rash (N = 698).[27] The three wipes compared were selected after being marketed specifically as mild enough for use on newborn skin.[28] The brand of wipes with the fewest ingredients (WaterWipes, containing purified water and grapefruit seed extract) was associated with reduced incidences and a shorter duration of moderate-to-severe nappy rash compared with the other two brands.[27]

CONCLUSION AND EXPERT RECOMMENDATIONS

In today's world, parents and carers can be overwhelmed by choice when choosing skin care products for their babies. The increased absorption of topical agents through baby skin and their impaired epidermal barrier function makes it important to choose cosmetics that maintain skin integrity.[8,10] Skin care guidelines use vague, poorly-defined terminology to classify products as being either suitable or unsuitable for baby skin[1–3,6,7] and suggest the avoidance of ingredients such as fragrances and alcohol that can be challenging to identify on packaging.[2,6] A review of the literature makes it clear that fragrances and alcohol are by no means the only ingredients with the potential to be irritants.[16,21–23] This is further supported by recent clinical data demonstrating that a brand of baby wipes with the fewest possible ingredients is associated with reduced incidences and a shorter duration of moderate-to-severe nappy rash compared with two other brands that are marketed specifically as being mild enough for newborns.[27]

Our recommendations are therefore for HCPs to endorse and parents or carers to choose baby wipes with the fewest possible ingredients for cleansing baby skin to maximise the avoidance of potential irritants. It should also be emphasised that even impurities in water have been associated with dermatitis in babies[21–23] and that an ideal baby wipe would also include water that is ultra pure.

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