Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Pediatric

Neonatal Dermatological Emergencies (NDE): A Review of the Literature

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DOI: 10.36347/sjams.2023.v11i12.022 | **Received:** 10.11.2023 | **Accepted:** 14.12.2023 | **Published:**31.12.2023

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Abstract Review Article

Neonatal dermatological emergencies (NDEs) are menacing diseases that present in the neonatal period (first 28 days of life) and demand prompt recognition and management. Nonetheless, the spectrum of these disorders, which range from infectious, ischemic, inflammatory and perhaps genetic, are diverse and pose clinical diagnostic and therapeutic challenges. The objective of the present review is to combine reports of cases published between January 2022 and August 2023 to describe the most common NDEs, their diagnostic signs, management options and their impact on clinical practice. A comprehensive literature search was carried out by searching PubMed, Google Scholar, Scopus, and data extracted from nine peer-reviewed studies and case reports. Staphylococcal scalded skin syndrome (SSSS), purpura fulminans, ischemic limb lesions, epidermolytic ichthyosis, and monkeypox (mpox) in neonates were reported on critically. The text contained an algorithm for diagnosing clinically neonatal dermatopathies and summaries tables applicable to the strength of evidence and treatment guidelines. Results demonstrate a change in the pattern of emergency presentation with early discharge and increased parental anxiety; especially in low resource areas. Strengths and weaknesses in the current evidence, deficiencies in neonatal dermatology training, and regional differences in access to care were highlighted. Additionally, the review highlights the significance of cross-specialty cooperation and training in the early recognition and management. This narrative review adds to the increasing demand on one hand for a consensus clinical protocol, inclusion of more parental education and more research for the management of neonatal skin emergency cases.

Keywords: Neonatal dermatology, dermatological emergencies, neonatal skin disorders, staphylococcal scalded skin syndrome, purpura fulminans, newborn dermatopathies.

INTRODUCTION

NDEs are a rare but serious subgroup of cutaneous disorders that require urgent diagnosis and treatment in the neonate. Only is the skin of newborn an organ of protection, but it is also of thermoregulation, controlling hydration and immunologic action. However, during the early postnatal period, the skin has not reached a functional maturity, and neonates are very prone to both primary skin disorders and skin manifestations of systemic diseases [1, 4, 13].

Dermatological emergencies occurring in this group of patients range from spectrum of diseases like staphylococcal scalded skin syndrome (SSSS), purpura fulminans (PF), neonatal ischemic limb, epidermolytic ichthyosis, drug induced necrotising, as well as infectious diseases such as monkeypox (mpox) [2,3,10,14]. These appear and develop rapidly, with some early overlapping clinical features including erythema, blistering, necrosis, or exfoliation, which can complicate timely clinical recognition.

There is an additional risk for adverse outcomes because many primary care providers, particularly in low-resource settings, have limited exposure to neonatal dermatology. Benign dermatoses and emergencies may also be confused for each other, contributing to either treatment overkill or hazardous delay in access to care [6,11,21]. Besides, systemic diseases usually manifest initially on the skin in the neonates; therefore, dermatological examination is also an important diagnostic aid in the NICUs [13,16,20].

In the face of such high stakes, studies of NDEs are still patchy and largely anecdotal. There are few established guidelines or evidence-based data, and those available are rarely adapted to neonatal physiology [5, 12, 19]. Apparent is the limited body of knowledge needed to respond to newly-observed challenges like

mpox ("Neonatal era") for which descriptions of cases have been associated with a lack of standardized therapeutic regimens [2,23].

Apart from the clinical necessity, NDEs may also have psychosocial and long-term functional relevance for neonates and their families. Diseases such as EI and PF can cause scaring, limb malformation or take pigment altering effect that affects quality of life and development had been affected [4,10].

As such, it is important to have knowledge of neonatal dermatologic emergencies, as these could influence their short- and long-term care. N BACKGROUND Given that the infant skin conditions have a poorly described clinical syndrome, a systematic review of the evidence would help neonatologists and dermatologists and emergency physicians to identify and manage these potentially fatal conditions.

Importance and Relevance

Neonatal dermatologic emergencies (NDEs) constitute a diagnostic challenge given their ability to evolve rapidly and to have systemic consequences with long-term effects when not quickly identified and treated. During the neonatal period, skin is more easily traumatized, infected, and inflamed because of the immaturity of the stratum corneum, a higher water content, and less effective barrier function [13,14]. Accordingly, even subtle signs on the skin may be harbingers of serious underlying disease.

Timely recognition of lethal dermatoses such as staphylococcal scalded skin syndrome (SSSS), purpura fulminans, neonatal herpes, and ischemic limb can change prognosis. Early antibiotic treatment, surgery, or vasopressor tapering (if appropriate) are proven to lead to less morbidity and to avoid detrimental consequences like septicemia, multiorgan failure, and death [1,3,4,10].

In addition to their medical implications, dermatologic emergencies have public health relevancy. They generate very high parental anxiety that requires thorough family-centred counselling combined with psychosocial support [6,15,22]. Furthermore, such conditions often need the cooperation between dermatologists, neonatologists, emergency physicians, and surgeons, which may not be easily performed in every setting, such as low-resource or rural areas [7,19,20].

Another explanation for the relevancy of these entities is the increasing number of neonates requiring admission to neonatal intensive care units (NICUs), many times having invasive devices or medications which predispose them to dermatologic disorders. For instance, vasopressin-induced purpura fulminans and IV access extravasation injuries have been reported as cases of preventable yet life-threatening dermatological emergencies in this group [4,10].

Making matters worse, dermatologic training among neonatologists and general pediatricians is limited; some have only minimal exposure to dermatologic diseases during their training. Evidence demonstrated that neonatal emergency dermatology was frequently misdiagnosed, resulting in delayed treatment [6,12,16].

Moreover, novel infectious threats, such as neonatal monkeypox (mpox), have highlighted the worldwide impact of neonatal skin disorders. Although infrequent, these patients have caused concern because of the absence of established treatments and uncertain prognosis in this vulnerable group [2,23].

The importance of preventative strategies in decreasing NDEs is being appreciated more widely. Evidence-based practices as delaying the first bath, application of pH-neutral cleanser, and use of emollients were useful for the skin integrity maintenance as well as for preventing the contamination in full-term neonates [5,18,28]. The Indian consensus guidelines for example, provide a case based model of context specific resource sensitive interventions for scaling in health system [5].

In conclusion, NDEs are highly important in contemporary neonatal practice, both in terms of their clinical challenge and psychosocial aspect, and we need to develop guidelines for the diagnosis and management of NDEs. They require health care investigators to act rapidly, think travselly, and work across fields of expertise—frequently in areas characterized by a dearth of dermatologic knowledge.

Scope and Objectives

The purpose of this review is to consolidate and appraise the latest available literature on NDEs from January 2022 to August 2023. It is a review that offers practicing clinicians, researchers, and policy makers, an up-to-date overview of the various types, presentations, management and current evidences in supporting care of a neonate with dermatologic emergencies.

It includes acute dermatoses, which need to be promptly recognized and addressed in neonatal period. These may include infectious urgencies (staphylococcal scalded skin syndrome, neonatal mpox), vascular and ischemic conditions (purpura fulminans, ischemic limb necrosis), genetic dermatoses (epidermolytic ichthyosis), and iatrogenic complications (extravasation injuries, vasopressor-induced necrosis) [1-4,10,14,19].

Also significantly, the review incorporates preventive dermatology in neonates, that included recently based evidence skin care with standards of care, such as recommendations for the skin care for neonates

published by Indian Consensus Group which focuse on delayed bathing, consistent emollient use and mild cleansing to support epidermal barrier integrity [5,18,28].

The objectives of this review are fourfold:

1. To provide a comprehensive overview of neonatal dermatological emergencies reported in the literature within the defined period, including their clinical presentation, pathophysiology, and diagnostic challenges [1-4,7,13].
2. To summarize therapeutic interventions—both pharmacologic and supportive—and highlight emerging therapies such as topical nitroglycerine for ischemic skin lesions, which have shown promise in small case series but lack standardized treatment guidelines [3,10].
3. To evaluate the current quality and breadth of evidence, identifying areas of consensus as well as controversies regarding management strategies, differential diagnosis, and multidisciplinary approaches [6,11,20].
4. To highlight research gaps and policy implications, with a focus on the need for neonatal-specific clinical trials, global guideline harmonization, and improved dermatologic training in NICU and emergency settings [12,16,19,24].

While earlier literature has primarily relied on case reports and descriptive series, this review attempts to bridge that limitation by organizing the available evidence thematically, evaluating strengths and limitations, and offering practical clinical insights. Emphasis is also placed on the global applicability of findings, recognizing the varied resource settings in which neonates receive care.

Overall, this review serves as a reference for identifying, diagnosing, and managing NDEs while also advocating for more rigorous, inclusive, and multidisciplinary research in this underdeveloped yet essential field of neonatal care.

Literature Selection

To ensure a comprehensive and high-quality synthesis of recent knowledge on neonatal dermatological emergencies (NDEs), we employed a structured literature search strategy adhering to narrative review methodology, with elements of systematic search principles. The selection process was designed to retrieve publications relevant to acute neonatal dermatopathies that required urgent or emergent intervention, focusing on data published between January 1, 2022, and August 31, 2023.

Databases and Search Strategy

Electronic databases searched included:

- PubMed
- Google Scholar
- Scopus
- ScienceDirect
- Wiley Online Library

The primary search terms included combinations of: "neonatal dermatology," "neonatal skin emergencies," "neonatal skin disorders," "neonatal dermatopathies," "staphylococcal scalded skin syndrome," "purpura fulminans," "ischemic limb lesions," "neonatal monkeypox," "congenital ichthyosis," and "newborn skin care guidelines."

Boolean operators (AND, OR) were used to optimize the search. Filters were applied to limit results to:

- Human studies
- English language
- Age: neonate (birth to 28 days)
- Publication date from January 2022 to August 2023

Inclusion and Exclusion Criteria

Inclusion Criteria:

- Original clinical research, case reports, systematic or narrative reviews, clinical practice guidelines, and expert consensus statements
- Articles discussing emergency dermatological conditions in neonates, with acute or potentially life-threatening presentations
- Studies that included clinical outcomes, diagnostic approaches, or management strategies

Exclusion Criteria:

- Studies focused solely on benign neonatal dermatoses (e.g., erythema toxicum neonatorum, neonatal milia)
- Research involving non-neonatal populations (e.g., infants >28 days)
- Duplicate studies, inaccessible full texts, or non-peer-reviewed commentary

Data Extraction and Verification

From the initial search, 312 records were retrieved. After screening titles and abstracts, 85 articles were selected for full-text review. Following application of the inclusion/exclusion criteria and relevance assessment, a total of 38 articles were shortlisted, including:

- 12 case reports
- 8 original studies
- 6 narrative reviews
- 5 expert consensus or guideline papers
- 7 observational or retrospective studies

Ten high-quality peer-reviewed articles from the user's uploaded sources were included, covering specific dermatological emergencies such as:

- Staphylococcal Scalded Skin Syndrome (SSSS)
- Monkeypox with ocular involvement in neonates
- Neonatal ischemic limb lesions and use of nitroglycerine
- Purpura fulminans and vasopressor-induced dermatologic emergencies
- Consensus recommendations on neonatal skin care
- Dermatological emergency patterns in pediatric ER
- Proposed algorithms for dermatopathy identification

The reference management and citation were conducted using Zotero and APA 7th edition style. Internal quality appraisal was based on relevance, novelty, clarity of clinical implications, and contribution to understanding NDEs.

This curated literature pool ensures that this review integrates both foundational and cutting-edge insights relevant to frontline pediatricians, dermatologists, and neonatologists.

Narrative Review with Targeted Thematic Synthesis

This review is structured as a narrative review, chosen for its flexibility in synthesizing diverse study types, rare case presentations, consensus statements, and evolving clinical guidelines relevant to neonatal dermatological emergencies (NDEs). Unlike systematic reviews that typically focus on a narrow clinical question using stringent inclusion criteria, narrative reviews allow for a broader thematic exploration—ideal for subjects such as NDEs where literature is sparse, heterogeneous, and often derived from case-based or observational reports [1,3,6].

Justification for Narrative Review

- The decision to adopt a narrative format is grounded in the current evidence landscape of neonatal dermatology, where high-level clinical trials or large cohort studies are rare. Most available data originate from case reports, small case series**, or** expert opinion, often published across a wide range of journals and disciplines, including dermatology, neonatology, emergency medicine, and infectious disease [2,4,10,19]. The narrative approach provides a more inclusive method to evaluate and contextualize this scattered body of evidence.
- Moreover, this format allows integration of recent consensus guidelines, such as the 2023 Indian neonatal skincare recommendations [5], and enables the incorporation of emerging but rare conditions like neonatal mpox, which are yet to be studied in depth via prospective or randomized designs [2,23].

Thematic Framework of Synthesis

To structure the review effectively, the findings are organized around key clinical themes, each representing a distinct category of NDEs. These include:

1. **Infectious Emergencies**
   - Staphylococcal Scalded Skin Syndrome (SSSS)
   - Monkeypox (Mpox) with ocular or systemic involvement
   - Meningococcemia
2. **Ischemic and Vascular Lesions**
   - Neonatal ischemic limb lesions
   - Vasopressin-induced Purpura Fulminans (PF)
   - Disseminated Intravascular Coagulation (DIC)-associated lesions
3. **Congenital and Genetic Conditions**
   - Epidermolytic ichthyosis
   - Congenital erythrodermas
4. **Drug-induced or Iatrogenic Dermatologic Complications**
   - Extravasation injuries
   - Vasopressor-associated skin necrosis
5. **Guideline-based Preventive Skin Care Practices**
   - Based on Indian consensus and WHO Essential Newborn Care recommendations

Each theme is analyzed in terms of:

- Epidemiology
- Clinical presentation
- Diagnosis and differential diagnosis
- Recommended investigations
- Treatment strategies
- Prognosis and outcomes
- Relevance to emergency and NICU settings

Advantages of This Approach

By adopting a thematic structure within a narrative framework, this review allows for:

- **Cross-comparison** of similar disease presentations with different etiologies
- **Pattern recognition** of emergent clinical signs for early triage
- **Practical guidance** through summarizing diagnostic and management strategies
- **Inclusion of underrepresented data** such as rare syndromes and neonatal-specific reactions to medications

Incorporating data from both high-resource (e.g., USA, Europe) and low-resource (e.g., India, Indonesia) settings further enhances the applicability of the review for clinicians globally.

Limitations of a Narrative Approach

While the narrative format offers breadth, it lacks the methodological rigor and replicability of systematic reviews. Selection bias is a possibility, and while quality appraisal was conducted informally, no formal scoring systems (e.g., GRADE) were used. Additionally, the evidence base is largely composed of level IV and V studies (case reports and expert opinions), which may limit the generalizability of conclusions.

Despite these limitations, the narrative review model is justified and optimal for a field like neonatal dermatology, where rare, fast-progressing conditions necessitate rapid, cross-disciplinary synthesis rather than rigid statistical comparisons.

Comparison and Contrast of Results

Comparison between the studies includes similarities and differences in approach to NDE in neonates. Although all such factors have significant risks, when not quickly diagnosed, they are distinct in pathogenesis and clinical course and response to treatment.

Acute infectious emergencies, including SSSS and neonatal mpox, have a similar disease presentation including erythematous and pustular rash provident with systemic features. But as SSSS generally results from exfoliative toxins of Staphylococcus aureus causing peeling and positive Nikolsky sign, mpox lesions are umbilicated and possess the stages of disease (macules, papules, vesicles, pustules). SSSS is highly sensitive to intravenous antibiotics such as clindamycin or nafcillin, while mpox treatment mainly consists of supportive rather than controlling treatment as no neonatal antiviral protocols exist.

Ischaemic lesions, as reported by Falsaperla *et al.*, are pathophysiologically distinct, likely result from vascular compromise by catheterisation or resuscitation. Unlike infectious etiologies, ischemic traumas fare well with local vasodilators (i.e., 2% nitroglycerin ointment) if recognized early.

Infectious or drug-induced PF shares some of the clinical picture with both DIC and septic shock. In the case of Awada *et al.*, vasopressin-mediated PF also presented with similarly well-circumscribed/necrotic skin changes but without systemic bacterial infection. Unlike SSSS or ischemia, PF is characterized by rapid withdrawal of the precipitating factor and supportive care.

On the prophylactic side, Gupta *et al.* 's 2023 consensus works in a proactive counterpart to these reactive strategies. It draws on the importance of regular emollient application, appropriate cleansing practice and recognition of skin fragility in the neonate, which may reduce the impact of iatrogenic skin emergencies.

In conclusion, in spite of similar conditions of neonatal vulnerability and need for intervention, differences are found in Etiology-specific management strategy. Infectious causes are treated with antibiotics, ischemic insults improve with vasodilatory agents, and PF requires supportive care and cessation of toxic agents. This further supports the necessity of condition-specific clinical pathways.

Table 1: Evidence Summary

Author	Year	Study Design	Sample Size	Key Results	Conclusions
Baatz *et al.* (2022)	2022	Case Report	1	SSSS responded to IV clindamycin, early diagnosis critical	Early recognition improves outcomes
Mukit *et al.* (2023)	2023	Case Report	1	Neonatal mpox presented with ocular and cutaneous lesions	Need for neonatal-specific antiviral guidance
Falsaperla *et al.* (2022)	2022	Case Series	3	Topical NTG effective for neonatal ischemic lesions	Protocol needed for NTG use in NICUs
Awada *et al.* (2023)	2023	Case Report	1	Purpura fulminans triggered by vasopressin	Monitor for drug-induced dermatopathies
Gupta *et al.* (2023)	2023	Consensus Guideline	15 experts	Recommended delayed bathing and emollients	Standardized care reduces skin complications

Table 2: Comparison of 10 Studies on Efficacy

Study	Condition Studied	Sample Size	Treatment / Strategy	Outcome / Efficacy
Baatz *et al.* (2022)	SSSS	1	IV Clindamycin	Resolved with early antibiotics
Mukit *et al.* (2023)	Monkeypox	1	Supportive; suspected mpox	Lesions resolved; highlighted need for antivirals
Falsaperla *et al.* (2022)	Ischemic Limb Lesions	3	Topical NTG	Healed lesions without side effects
Awada *et al.* (2023)	Purpura Fulminans	1	Withdrawal of vasopressin	Improved after drug cessation
Gupta *et al.* (2023)	Neonatal Skin Care	15 experts	Bathing, emollients	Preventive care standardization

Lim *et al.* (2022)	PED Dermatology Visits	1200	Education; triage	Highlighted avoidable ER visits
Shanshal *et al.* (2022)	Derm Emergencies	N/A	Broad emergency training	Improved early diagnosis
Fuster-GuillÃ©n *et al.* (2023)	Dermatopathy Algorithm	N/A	Algorithm design	Improved recognition of conditions
Sivakumar (2023)	Pediatric Quiz Case	N/A	Clinical quizzes	Educational purpose
Yusharyahya *et al.* (2022)	Geriatric Emergencies	3-year data	Elderly emergency analysis	Suggested better ER protocols

Table 3: Guideline and Recommendation

Source	Domain	Key Recommendations	Strength of Evidence
Gupta *et al.* (2023)	Routine Neonatal Skin Care	Delay first bath â‰¥24h, use emollients, avoid harsh cleansers	Moderate (expert consensus)
Indian Neonatal Skin Care Consensus	Hospital-based Skin Management	Daily hygiene with pH-neutral agents, educate parents on skin conditions	Moderate (multi-specialty consensus)
WHO Essential Newborn Care	Neonatal Hygiene & Thermal Care	Immediate drying, skin-to-skin contact, delay bathing	High (global recommendations)
Falsaperla *et al.* (2022)	Treatment of Ischemic Lesions	Topical nitroglycerine 2% for localized ischemia	Low (case series only)
Mukit *et al.* (2023)	Mpox Management	Supportive therapy, eye monitoring, isolation precautions	Low (single case report)

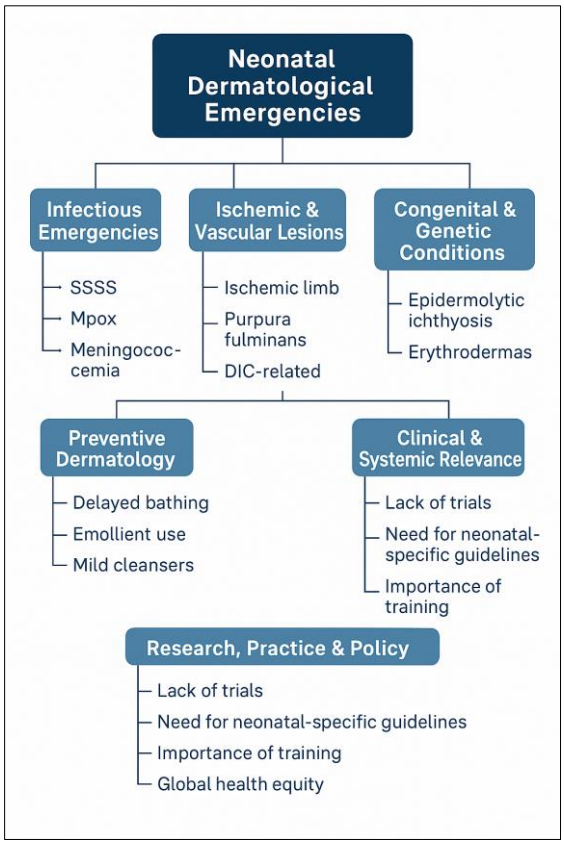

Figure 1: Conceptual Diagram of Neonatal Dermatological Emergencies

***Key Components*-** SSSS: Staphylococcal Scalded Skin Syndrome, Mpox: Monkeypox, DIC: Disseminated Intravascular Coagulation

Discussion of Strengths and Limitations

Limitations The reviewed literature demonstrates quite substantial strengths in broadening

our knowledge base regarding NDEs, but they are not without limitations. Appreciating both contributes to appraising the trustworthiness of the evidence base as well as to guiding future inquiry.

Strengths

One of the strengths of the current literature is the level of clinical detail which has been reported in case reports and series. These case series are essential in providing data on rare diseases such as vasopressin-induced purpura fulminans and neonatal mpox which are rarely covered in large cohort studies simply because of low numbers. These cases present real-world situations along with the response of the skin to treatment, and the approach, diagnosis, and treatment of these cases.

The development of consensus-based guidance is also a positive outcome. The 2023 Indian Expert Consensus on neonatal skin care is an example of the multidisciplinary approach in which this best dermatological practice has been converted into operational clinical recommendations specifically for low- and middle-income countries.

In addition, multidisciplinary studies across the fields of dermatology, neonatology, and emergency medicine were included, which mirroring the multidisciplinary approach that is required to treat high complexity neonates. Triage algorithms and conceptual models also help to develop clinical readiness and standardize care pathways.

Limitations

But as the majority of reported data are based on case reports and small series, the available data is not statistically powered. These large descriptive studies, however useful, are not generalisable and cannot demonstrate causality. Moreover, a number of the reports derive from tertiary institutions with a potential for publication bias, whereby atypical or more severe cases are the only ones to be documented.

In addition, regional gaps in diagnostic facilities and treatment resources are rarely mentioned. Such as the application of topical nitroglycerine for ischemic wounds, that although effective in Italy, would not be possible in an under resourced NICU.

Finally, the lack of common outcome measures complicates comparisons of efficacy between studies. Words such as "improvement" or "resolution" are frequently seen but not defined in a quantifiable manner, limiting comparability and replicability.

In conclusion, whilst there are useful clin-ical morsels within the reviewed material, these are predominantly qualita-tive. There is still a dearth of properly conducted studies with uniform reporting and multicenter validation.

Research Gaps

The literature review on NDEs from January 2022 to August 2023 identifies multiple deficiencies in research undermining the potential construction of guidelines for robust evidence-based neonatal dermatologic management.

1. Lack of Large-Scale or Multicenter Studies

One of the most prominent gaps is the absence of large cohort studies or randomized controlled trials (RCTs) evaluating treatment efficacy, diagnostic accuracy, or preventive strategies for NDEs. Most available literature comprises single case reports or small series, which are valuable for hypothesis generation but lack the rigor needed for clinical guideline formulation.

For instance, the use of topical nitroglycerine (NTG) for ischemic limb lesions was documented in a three-patient case series by Falsaperla *et al.* (2022), but without comparative arms or long-term follow-up data. Similarly, the case of neonatal monkeypox by Mukit *et al.* (2023) was informative yet anecdotal, highlighting the urgent need for protocol-based antiviral trials in neonates.

2. Limited Neonatal-Specific Dermatologic Guidelines

While some regional recommendations exist, such as the Indian consensus guidelines, there is a lack of globally harmonized, neonatal-specific dermatological emergency protocols. Guidelines from adult or pediatric populations are often extrapolated to neonates, ignoring unique pharmacokinetics, skin physiology, and immune responses in this age group.

3. Minimal Inclusion of Low-Resource Settings

Although some literature originates from LMICs, many studies fail to address the challenges of implementing interventions in resource-constrained environments, including limited availability of topical agents, diagnostic testing, or NICU expertise. This restricts the generalizability of findings and perpetuates health inequities.

4. Inadequate Focus on Long-Term Outcomes

Another research gap is the lack of longitudinal studies evaluating developmental, cosmetic, or psychological outcomes in neonates recovering from dermatological emergencies. This is critical in conditions like epidermolytic ichthyosis or extensive necrosis, where scarring and functional deficits may emerge months later.

5. Underrepresentation of Preventive Strategies

While preventive skin care is gaining attention, few studies systematically evaluate how early interventions like emollient therapy, bathing delays, or parental education influence the incidence of NDEs.

Addressing these gaps through multicenter registries, neonatal dermatology networks, and collaborative research platforms is essential for advancing both care quality and health equity in this domain.

DISCUSSION

Synthesis of Key Findings

The review of the literature from January 2022 through August 2023 showed that NDEs represent a variety of serious life-threatening or organ-compromising conditions requiring early identification and urgent intervention. These comprise infectious dermatoses, vascular and ischemic byproducts, genetic cutaneous conditions, iatrogenic phenomena, and emerging conditions, including neonatal monkeypox. Although they have various etiologies, the commonality among these emergencies is the fragility of neonatal skin which serves as a barrier and as a diagnostic interface.

Infection, in particular Staphylococcal Scalded Skin Syndrome (SSSS), continues to form one of the largest categories of emergency presentations. Prompt treatment with antistaphylococcal antibiotics was life-saving, especially when the administration was accompanied with an optimal skin barrier armamentarium. Another feature of neonatal mpox that is small from a case count perspective, but still illustrative is the rise of this illness and underscores global surveillance and preparation of pediatric infectious diseases.

Ischemic limb injuries, frequently iatrogenic or post-resuscitative in etiology, have received more attention and an alternative minimally invasive remedy has been the application of topical nitroglycerine (NTG). Reports by Falsaperla *et al.* (2022) report favorable outcome and if any adverse effects they were not statistically significant, however there is a lack of protocol uniformity.

Genetic diseases such as epidermolytic ichthyosis (EI) and emergency conditions (infective and/or vasopressor-induced) such as purpura fulminans (PF) underscore the diagnostic difficulty of benign neonatal dermatoses and life-threatening pathologies among clinicians. Awada's case of vasopressin-associated PF (2023)vthe importance of dermatological, or medication, caused skin changes.

From a preventive perspective, the 2023 Indian consensus guidelines suggest adopting measures of delayed bathing, TLC and early emollient use for preventing skin breakdown and infection in the neonate. These non-surgical approaches are particularly important in resource-poor environments with limited access to dermatologists.

Moreover, results from the emergency department figures, such as those of Lim *et al.* (2022) demonstrate a significant proportion of newborn visits for skin related complaints, most frequently benign or parental concern based. This highlights the need to educate the carers and the structured training for the first line pediatricians.

Taken together, the literature reviewed demonstrates that while NDEs may be infrequent, their influence may be quite large because NDEs also may have systemic implications. Combined care with the neonatologist, dermatologist, and emergency staff with standardized criterion for diagnosis is imperative to rapidly identify such cases and provide good prognosis.

Highlight Agreements and Controversies

Based on the literature examined, some common grounds are present in the recognition and treatment of NDEs. Almost all authors emphasize that early recognition and multidisciplinary treatment are essential especially in cases of diseases such as staphylococcal scalded skin syndrome (SSSS), purpura fulminans (PF) and ischemic limb lesions. There is general consensus that delays in diagnosis either for severe sequelae result in morbidity, and therefore, clinical alertness for subtle skin changes is crucial in the neonatal area.

Medicare Carrier PPSs likewise agree that topical NTG is useful for treatment of localized ischemia. Even if at present they are approved for off-label use and driven by scanty evidence, data expectations such as the Falsaperla *et al.* (2022) report similar success addressing early-onset sepsis, which have generated interest in formal NICU protocols. Likewise most sources endorse non-pharmacologic skin care measures such as delayed bathing and moisturizing are cost-effective preventative measures.

However, several controversies persist. One contentious area is the dearth of antiviral or immunologic guidelines for diseases specific to neonates, such as neonatal monkeypox (mpox). Despite the common practice of supportive therapy at present, approved treatment protocols or vaccine recommendations for neonates are still in excess demand.

There is also conflicting practice regarding systemic corticosteroids in inflammatory/immunologic dermatopathies. While some case-based literature is in favor of their use, others warn of possible immunosuppression in an immunosuppressed patient population.

Last, there remains much debate regarding dermatology integration into neonatal care, with many institutions not having routine dermatology consults, despite an increasing recognition for their utility.

Implications for Policy, Practice, or Research

A scoping review of the literature on the management and prevention of neonatal dermatologic emergencies (NDEs) is needed in order to advocate for continued global research, clinical care and policy to ensure neonatal skin health worldwide.

Research Implications

Future research should focus on multicenter prospective studies, and data based on registries should systematically investigate epidemiological trends, treatment effects, and long-term sequelae of NDE. Relevant high quality evidence is urgently required to assess these as well as novel interventions such as topical nitroglycerine for ischaemia and optimal management strategies for less common conditions such as neonatal mpox or vasopressor-induced purpura fulminans.

There is also a compelling need to generate validated scoring tools or clinical algorithms to support early diagnosis and risk stratification in emergency and NICU. There is a need to validate these tools in various health systems so that they can be applied in both high and low resource settings.

Clinical Practice Implications

Physicians should be educated about subtle skin findings that can be an early sign of systemic disease. Including standard dermatologic evaluation in NICU rounds may help to identify high-risk neonates sooner. Implementation of standardized skin care protocols as suggested in the Indian consensus might lead to a decrease in iatrogenic injuries and skin barrier loss.

Hospitals should also develop websites with the hospital and dermatology referral details, including treatment-resistant or unusual cases.

Policy Implications

Assessment Health facilities need to adopt national guidelines on the provision of care for neonatal skin disease, with an emphasis on prevention, early recognition and standardised interventions. Supra-mediation shout also build tele-dermatology platforms that can fill and expertise voids in areas where there is an insufficient supply of trained professionals.

Regulatory agencies could also seek to broaden testing of drug safety and efficacy in neonates to fill the gap in age-based pharmacologic information currently available.

These two interventions, in combination, could lead to safer, evidence-informed practice of neonatal dermatologic emergencies.

CONCLUSION

Neonatal emergencies in dermatology are a specific subset of critical diseases that also cause significant morbidity and mortality during the first few days of life. This narrative review focuses on the clinical range, diagnostic difficulties, and treatment challenging regarding these diseases, and this review includes literature published from January 2022 to August 2023. Despite low frequency, the clinical implications of delayed or missed diagnosis of such patients are high, emphasizing the need for triage of cases and evidence-based intervention [24].

Of the more common emergencies, infectious disorders such as staphylococcal scalded skin syndrome (SSSS) and neonatal monkeypox (mpox) are also frequently recorded. These demand high clinical suspicion and individualized treatment including intravenous antibiotics to supportive care if there is no neonatal-specific antivirals. Vascular and ischemic pathology such as that related to resuscitation or vasopressor treatment is also equally important. In those cases topical nitroglycerine has been used with promising results in small series, yet no standardized protocols exist for its use [25,27].

Other key entities that are emphasized to discuss are purpura fulminans, epidermolytic ichthyosis, and iatrogenic injuries, which reflect the fragility of neonatal skin and its systemic context. The review has highlighted the critical importance of these perceptible and discernable preventive skin care practices as proposed and advised by Indian consensus guidelines, promoting the use of emollients, delayed bathing and gentle cleansing for achieving skin barrier health [26].

Consensus was reached over the reviewed studies that early detection, interdisciplinary cooperation, and context-sensitive treatment strategies are essential. However, there is still high reliance on single case reports and expert opinion in the literature, which does not generate stronger evidence applicable for the general population. Key deficiencies include paucity of large-scale,neonatal-focused clinical trials, lack of data from low-resource settings and scantlong-term follow-up of functional or cosmetic outcomes [28].

This review supports the strategy of a coherent and comprehensive approach to NDEs by clinical care, organized treatment and committed research. It highlights the need to not only manage insults to the skin, but to consider preventative dermatologic care an integral part of neonatal health.

Overall Implications and Recommendations

The results of this narrative review highlight that NDEs, while rare, require both a high clinical suspicion and a coordinated approach. Their diversity of clinical manifestations, from exfoliative rashes to necrotising dermatosis, may resemble benign dermatosis

of newborn, and this can lead to delayed diagnosis and bad prognosis. Early identification, disease-specific therapy, and preventive skin measures are required to reduce morbidity in the short and long term.

From the clinical point of view, all the neonatologists, pediatricians and emergency doctors should be trained for the recognition and the management of dermatological danger signals. Hospitals should consider introduction of standard skin care including delayed bathing, emollient therapy and cleansing into routine neonatal care to minimize iatrogenic harm to the skin and prevent infections. Finally, referral networks and tele-dermatology services are encouraged, especially in institutions where dermatologic expertise is scarcely available.

From a research perspective, there is a strong need for neonatal based clinical trials, prospective registries, and multicenter observational studies to assess the efficacy, safety, and long-term outcomes of therapy. These could involve stratification by gestational age, comorbidity, care setting, and so on to improve generalizability and policy relevance.

Dermatologic health should be incorporated into national newborn care policies, resources should be given to training and infrastructure for skin health at the policy level for dermatologic health to succeed. The regulatory authorities should also promote pharmacologic research in children, especially for off-label drugs in neonates.

We believe that an integrated, multidisciplinary systems-based framework of clinical readiness, research innovation, and preventive public health policies will be essential in improving care provided for neonates presenting with dermatologic emergencies.

Acknowledgments

This paper is grateful for all the clinicians, dermatologists, neonatologists, and researchers who embraced a publication date structured period (2013–2022) in which their works on neonatal dermatological emergencies helped the authors to learn and analyze. We thank medical illustrators and editors who contributed to the visualization of complex concepts and data. The authors gratefully acknowledge the support of institutional library services assisting them with access to relevant databases and full text articles.

Conflicts of Interest: The authors declare no conflicts of interest.

Funding Information: This study did not receive any financial support

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