

Spectrum of cutaneous manifestations in neonates at a tertiary care center

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ABSTRACT

Background: The neonatal period encompasses the initial four weeks of extra-uterine life. Skin lesions in neonates range from transient physiological, self-limiting conditions to pathological dermatoses. An awareness of the physiological skin changes in neonates is needed to differentiate them from pathological dermatoses, thereby avoiding unnecessary treatment and mental stress to the parents. **Aim:** The aim was to study the clinical pattern of neonatal dermatoses and their prevalence at a tertiary care center. **Materials and Methods:** An institutional, prospective, observational study was conducted at the outpatient department of dermatology, venereology, and leprosy. A total of 195 neonates from the postnatal ward, pediatric ward, and dermatology department of the same institution with at least one cutaneous manifestation over the period of six months were included in the study. **Results:** Among the 195 neonates, cutaneous manifestations were noted in 176 neonates (90.8%), among which 82 (46%) were males and 94 (54%) were females; 163 (92%) were full-term and 14 (8%) were preterm; 89 (51%) were born through vaginal delivery and 87 (49%) by caesarean section. Skin manifestations may be broadly divided into physiological skin lesions accounting for 80% of cases, transient non-infective conditions (10%), eczematous eruptions (2%), birthmarks (3%), and others (5%). The most common among all was the Mongolian spot accounting for 98 (56%) cases. **Conclusion:** A majority of the neonatal dermatoses were transient physiological, requiring only reassurance and no medical treatment; however proper understanding and identifying the pathological conditions are critical for early diagnosis and intervention.

Key words: Neonatal dermatoses; Mongolian spot; Physiological; Sebaceous gland hyperplasia

INTRODUCTION

The neonatal period encompasses the initial four weeks of extra-uterine life. Neonatal skin differs from adult skin by being thinner (40–60%), less hairy, with a weaker dermoepidermal attachment, and being less effective in detoxifying and eradicating compounds applied to it [1]. As compared to adult skin, which comprises 3% of the total body weight, neonatal skin comprises 13% of the body weight. In addition, a neonate has a body surface area-to-weight ratio three to five times of an average adult. The stratum corneum is markedly

thinner in a premature neonate and lipid production is also minimal due to immature epidermal and sebaceous gland function.

Neonatal skin diseases are fascinating, with a unique spectrum of dermatological conditions. A host of cutaneous manifestations varying from physiological (such as the Mongolian spot) to grossly pathological (incontinentia pigmenti) are seen in neonates. Sometimes, innocent rashes in a neonate may be confused with pathological conditions. Hence, the understanding of benign cutaneous conditions

How to cite this article: Pujitha BB, Joweriya R, Ramadevi B, Babu TN, Ramadas K. Spectrum of cutaneous manifestations in neonates at a tertiary care center. Our Dermatol Online. 2023;14(2):150-155.

Submission: 27.07.2022; **Acceptance:** 03.12.2022

DOI: 10.7241/ourd.20232.6

in the newborn and the ability to identify more worrisome presentations are essential to the care of the neonate, aiding the physicians in arriving at a correct diagnosis and avoiding unnecessary investigations and medications, ultimately relieving the anxiety and mental trauma of the parents.

The present literature in our country is meager and further understanding of neonatal cutaneous manifestations would be helpful.

MATERIALS AND METHODS

A hospital-based, prospective, observational study was conducted at the department of dermatology from September 2020 to March 2021. Cases were enrolled from the labor room, postnatal ward, and dermatology outpatient department. A total of 195 newborns up to one month of age over a period of six months, irrespective of the mode of delivery, gestational age, and sex, were included in the study.

A complete medical history regarding the onset, duration, and progression of the lesion and any treatment given together with gestational age and family history were taken. A detailed examination of the neonate was performed from the head to toe including the head and chest circumference, length, clubbing, icterus, and vitals of the neonate along with cutaneous examination, which included the morphology and distribution of the lesions. Mucosal examination of the neonate was performed, including the oral, genital, buccal, and nasal mucosa. The hair was examined for any alopecia patches, color, texture, and density. The nails were examined for brittleness or discoloration.

Ethics Statement

Institutional ethical committee certificate was taken.

RESULTS

Among the 195 neonates, 176 (90.2%) neonates had one or more cutaneous manifestations. Among the 176 neonates, 94 (54%) were females, 82 (46%) were males (Fig. 1); 162 (92%) were born at term and 14 (8%) were preterm. The average birth weight between 2.5–3 kg was seen in 133 (76%) cases, low birth weight was observed in 24 (42%), and very low birth weight was observed in one (0.5%). With regard to comorbidities, ten (5.6%) mothers had hypothyroidism; six (3.4%)

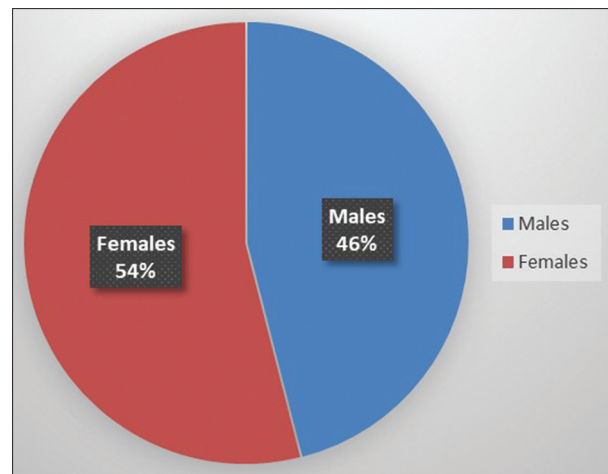


Figure 1: Sex distribution of the neonates.

had gestational diabetes mellitus, and two (1.1%) had hypertension. Regarding maternal insults, placenta previa was encountered in three (1.7%) mothers, meconium stained liquor in two (1.1%), and dengue, COVID, and abruptio placenta in one mother each (0.5%). Only one case of dichorionic diamniotic twins was seen in our study.

The percentage of consanguineous marriages and non-consanguineous marriages among the parents of the neonates were seen in 20% and 80% of the cases, respectively. The mode of delivery was 89 (51%) cases of caesarian and 87 (49%) cases of normal vaginal delivery.

In our study, physiological skin lesions were more common, accounting for 215 (80%) cases, followed by transient non-infective conditions in 26 (10%), others in 15 (5%), birthmarks in 8 (3%), and eczematous eruptions in 7 (2%), in decreasing order of frequency (Figs. 2 and 3) (Table 1).

Most of the neonates had more than one physiological skin lesion, among which the Mongolian spot was most commonly seen in 98 neonates (56%), out of which 54 (55%) were females and 44 (45%) were males. The most common site of location was the lumbosacral area, buttocks, and extremities, in decreasing order of frequency. Sebaceous gland hyperplasia (Fig. 4) was seen in 63 neonates (36%), among which 34 (54%) were males and 29 (46%) were females. Milia (Fig. 5) was seen in 32 neonates (18%), among which 15 (46%) were females and 17 (54%) were males; most commonly on the forehead and nose, followed by the chin.

With respect to maturity, skin lesions were more common in preterm neonates when compared to

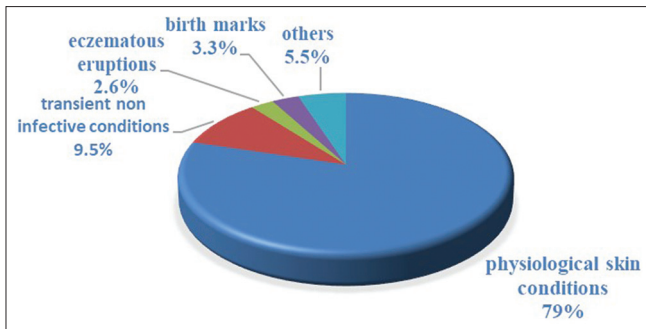


Figure 2: Types of neonatal dermatoses seen.

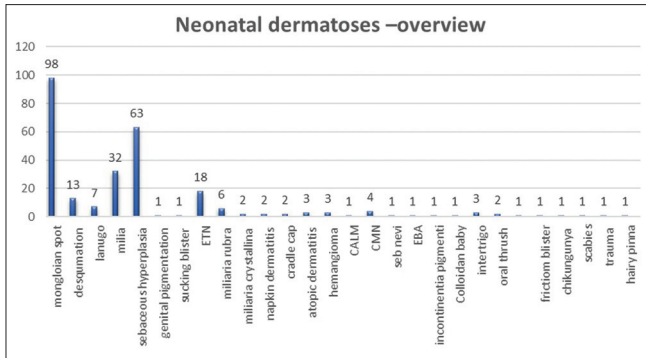


Figure 3: Overview of all dermatoses.



Figure 4: Sebaceous gland hyperplasia.

term neonates. The Mongolian spot was seen in 90 (55%) term neonates and 8 (57%) preterm neonates. Sebaceous gland hyperplasia was seen in 55 (33%) term neonates and 8 (57%) preterm neonates. Milia was seen in 31 (19%) term neonates and 1 (7%) preterm neonate. Hypertrichosis lanuginosa was seen in 6 (3%) term neonates and 1 (7%) preterm neonate. Miliaria rubra was seen in 5 (3%) term neonates and 1 (7%) preterm neonate.

Erythema toxicum neonatorum (Fig. 6) was most commonly seen among the transient non-infective dermatoses, accounting for 18 (10%) neonates, among



Figure 5: (a) Hemangioma and (b) milia.

Table 1: Frequency of cutaneous manifestations in the neonates.

Skin Manifestation	N	Percentage (%)
Physiological		
i Desquamation	13	7%
ii Mongolian spot	98	56%
iii Hypertrichosis lanuginosa	7	4%
iv Milia	32	18%
v Sebaceous gland hyperplasia	63	36%
vi Genital pigmentation	1	0.5%
vii Sucking blister	1	0.5%
Transient non-infective dermatoses		
i ETN	18	10.2%
ii Miliaria rubra	6	3.4%
iii Miliaria crystallina	2	1.1%
Eczematous eruptions		
i Napkin dermatitis	2	1.1%
ii Cradle cap	2	1.1%
iii Atopic dermatitis	3	1.7%
Birthmarks		
i Vascular	3	1.7%
• Hemangioma	1	0.5%
ii Pigmentary	4	2.2%
• CALM	1	0.5%
• CMN		
• Sebaceous nevi		
Others		
i EBA	1	0.5%
ii Incontinentia pigmenti	1	0.5%
iii Collodion baby	1	0.5%
iv Neonatal acne	1	0.5%
v Intertrigo	3	1.7%
vi Oral thrush	2	1.1%
vii Friction blister	1	0.5%
viii Chikungunya	1	0.5%
ix Scabies	1	0.5%
x Trauma	1	0.5%
xi Hairy pinna	1	0.5%
xii Insect bite reaction	1	0.5%

which 12 (67%) were males and 6 (33%) were females. Miliaria rubra was seen in 6 (3.4%) neonates, with no sex predilection. Miliaria crystallina (Fig. 7) was seen in 2 (1%) term male neonates.

Eczematous eruptions were seen in 7 (2.5%) neonates, among which 4 (57%) were males and 3 (43%) were females. Atopic dermatitis was seen in 3 (1.7%) neonates, among which 2 (67%) were males and 1 (33%) was a female. Cradle cap was seen in 2 (1%) male term neonates and napkin dermatitis was seen in 2 (1%) female term neonates.



Figure 6: Erythema toxicum neonatorum- different presentations.



Figure 7: (a) Collodion baby and (b) miliaria crystallina.

Birthmarks were seen in 9 (3%) neonates, among which vascular birthmarks (hemangioma) (Fig. 5) were seen in 3 (1.7%) neonates, among which 2 (67%) were female and 1 (33%) was male. Pigmentary birthmarks were seen in 6 (3.4%) neonates, among which congenital melanocytic nevi were seen in 4 (2.2%) neonates, sebaceous nevi were seen in 1 (0.5%) female term neonate and café-au-lait macules were seen in 1 (0.5%) neonate.

Other neonatal dermatoses seen were intertrigo in 3 (1.7%) cases, oral thrush in 2 (1.1%), epidermolysis bullosa in 1 (0.5%), incontinentia pigmenti in 1 (0.5%), collodion baby in 1 (0.5%), neonatal acne in 1 (0.5%), friction blister in 1 (0.5%), scabies in 1 (0.5%), hairy pinna in 1 (0.5%), chikungunya in 1 (0.5%), trauma/bruise in 1 (0.5%), and insect bite reaction in 1 (0.5%). Due to the intravenous insertion of the cannula and the withdrawal of blood samples, the most common area involved in bruises was the hands according to previous studies (Figs. 7 and 8).



Figure 8: (a) Incontinentia pigmenti, (b) chikungunya pigmentation, (c) neonatal acne, and (d) scabies.

One case of collodion baby was seen having a glue-like, transparent membrane covering the entire body of neonate at birth with eclabium and ectropion.

DISCUSSION

In the present study, among the 176 neonates, 94 were females and 82 were males, which correlates well with a study by Zagne et al., wherein a female preponderance was observed [2]. However, this is incongruous with a study done by Deshpande et al. and Saranya et al. wherein a male preponderance was seen [3,4].

The most common dermatosis observed was the Mongolian spot in 56% of the neonates. A similar

incidence was seen in studies done by Zagne et al., Saranya et al., Uzma et al., Khoshnevisasl et al., and Vijay et al. [2,4-7]. These are slate-gray to blue macules varying from 3 to 10 cm in size. The most common site of location was the lumbosacral area, followed by the buttocks and extremities, yet the Mongolian spot was extensive, covering much of the trunk and buttocks in two neonates. The color is produced by melanocytes deep in the dermis probably as a result of failure to cross the dermo-epidermal junction while migrating from the neural crest during fetal life. Some studies found the prevalence of the Mongolian spot in Asians to be as high as 80% to 90% and 7% to 40% in Caucasians [8,9], suggesting an interracial difference. In Indians, the prevalence ranges from 77% to 84% [3,10,11].

The next common dermatosis witnessed was sebaceous gland hyperplasia in 36% of the neonates, which was in agreement with studies by Vijay et al., Balachandran et al., and Behera et al. [7,12,13]. However, it was incongruous with studies by Gudurpenu et al. and Swathi et al. [14,15], in which a 6.8% and 2.8% incidence was found, respectively. The occurrence of sebaceous gland hyperplasia in other studies varied from 30% to 89.4% [3,5,6,14]. Sebaceous gland hyperplasia was noted in twins in our study. Sebaceous gland hyperplasia in the newborn is a physiologic event secondary to the influence of maternal androgens. This presents as multiple, pinpoint, uniform, yellowish papules on the cheeks, nose, forehead, and upper lips [14].

Milia refers to follicular epidermal cysts appearing as numerous facial 1–3mm globular papules [14]. It was witnessed in 18% of the neonates, which was in concordance with the study by Sneha et al., Farhana et al., and Javed [10,11,16]. The occurrence of milia in other studies ranged from 7% to 42% [5,7,10,11,16,17]. Physiological desquamation was seen in 7% of our cases, more commonly on days 3–6. Hypertrichosis lanuginosa was seen in 4% of the neonates, which was in concordance with a study by Swathi et al. [15].

Erythema toxicum neonatorum (ETN) was most commonly seen among the transient non-infective conditions accounting for 10.2% of the neonates, which was in concordance with studies by Saranya et al. and Javed [4,16]. It is characterized by blotchy, macular erythema with a 1–4 mm central vesicle or pustule usually involving the trunk and extremities and presenting within 48 to 72 hours. The majority of the babies developed ETN on day two of their life. A male predominance was noted in our study.

Miliaria rubra was the second most commonly encountered among the transient non-infective dermatoses, accounting for 3.4% of the neonates, which was in concordance with a study by Divya et al. [18]. The incidence in other studies varied between 2.6% to 9.6%, which may be attributed to the tropical climate of India, the traditional practices of overwrapping babies in swaddles, and massaging oils. Miliaria crystallina was noted in two neonates; one of the mothers' history revealed dengue infection antenatally.

Atopic dermatitis was most commonly noted among the eczematous eruptions; accounting for 1.7% of the neonates, with a male predominance. The peak age noted for the presentation of eczematous disorders was the third-to-fourth week of life.

Benign cephalic pustulosis (neonatal acne) was noted in one baby. Accessory tragus was present in one baby in the left ear; whereas, in previous studies, it was reported in the right ear. A case of congenital hyperpigmentation secondary to chikungunya infection was noted. Among genodermatoses, the features of epidermolysis bullosa simplex and collodion baby and incontinentia pigmenti were seen in 0.5% of the neonates each. Suction blister was noted on the arm in 0.5% of the neonates.

CONCLUSION

It is imperative for pediatricians, dermatologists, and newborn primary care physicians to differentiate the physiological skin changes in neonates from the pathological ones, so as to reassure and convey confidence to the parents regarding physiological changes and guide when intervention is needed. A majority of the newborns had one or more dermatoses, among which physiological dermatoses were seen commonly. This study highlights the different clinical spectra of the presentations of dermatosis in neonates at a tertiary care center. The limitation of our study was the short follow-up period.

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.

REFERENCES

- Oranges T, Dini V, Romanelli M. Skin physiology of the neonate and infant: Clinical implications. *Adv Wound Care (New Rochelle)*. 2015;4:587-95.
- Zagne V, Fernandes NC. Dermatoses in the first 72 h of life: A clinical and statistical survey. *Ind J Dermatol Venereol Leprol*. 2011;77:470-6.
- Deshpande AB, Tolat SN. A clinical study of physiological skin manifestations in neonates. *Int J Health Sci Res*. 2019;9:43-6.
- Hogade AS, Saranya D. A clinical study of cutaneous manifestations in neonates. *Int J Res Dermatol*. 2017;3:130-3.
- Uzma A, Zaman T, Rashid T, Jahangir M. Cutaneous manifestations in 1000 Pakistani newborns. *J Pak Assoc Dermatol*. 2010;20:199-205.
- Khoshnevisasl P, Sadeghzadeh M, Mazloomzadeh S, Zanjani AA. The incidence of birthmarks in neonates born in Zanjan, Iran. *J Clin Neonatol*. 2015;4:8-12.
- Agarwal G, Kumar V, Ahmad S, Goel K, Goel P, Prakash A, et al. A Study on neonatal dermatoses in a Tertiary Care Hospital of Western Uttar Pradesh India. *J Community Med Health Educ*. 2012;2:169.
- Giuffrida R, Borgia F, De Pasquale L, Guarneri F, Cacace C, Cannavò SP. Skin lesions in preterm and term newborns from Southern Italy and their relationship to neonatal, parental and pregnancy-related variables. *G Ital Dermatol Venereol*. 2019;154:400-4.
- Moosavi Z, Hosseini T. One-year survey of cutaneous lesions in 1000 consecutive Iranian newborns. *Pediatr Dermatol*. 2006;23:61-3.
- Sneha M, Sadagopan K, Vaishnavi D. A clinical study of cutaneous manifestations in neonates at a tertiary health care center. *Int J Res Dermatol*. 2021;7:658-62.
- Haveri FTTS, Inamdar AC. A cross-sectional prospective study of cutaneous lesions in newborns. *Int Schol Res Notices*. 2014:1-8
- Kunjukunju BP, Jayamohan R. A clinical study of physiological skin changes in neonatal period. *J Evid Based Med Healthc*. 2017;4:2553-7.
- Behera B, Kavadya Y, Mohanty P, Routray D, Ghosh S, Das L. Study of physiological and pathological skin changes in neonates: An east Indian perspective. *Indian J Paediatr Dermatol*. 2018;19:40-7.
- Gudurpenu S, Bubna AK, Rangarajan S, Veeraraghavan M, Krishnamoorthy M, Rajesh G. A clinical study of cutaneous lesions in neonates at a tertiary health care center in Chennai. *Indian J Paediatr Dermatol*. 2017;18:18-23.
- Shivakumar S, Manjunathswamy B S, Metgud T, Doshi B. Cutaneous manifestations in neonates: A 1-year cross-sectional study in a tertiary care hospital. *Indian J Health Sci Biomed Res*. 2018;11:125-9
- Javed M. Clinical spectrum of neonatal skin disorders at Hamdard University Hospital Karachi, Pakistan. *Our Dermatol Online*. 2012;3:178-80.
- Nahar S, Dey D, Elahi A, Haider N, Biswas RSR. Pattern of dermatosis among the admitted neonates in a tertiary care hospital. *Chatt Maa Shi Hosp Med Coll J [Internet]*. 2020 Aug 28.
- Gorur DK, Murthy SC, Tamraparni S. Early neonatal dermatoses: A study among 1260 babies delivered at a tertiary care center in South India. *Indian J Paediatr Dermatol*. 2016;17:190-5.

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Source of Support: This article has no funding source.

Conflict of Interest: The authors have no conflict of interest to declare.