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Cutaneous manifestations in neonates: A 1-year cross-sectional study in a tertiary care hospital

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Abstract:

BACKGROUND: Skin lesions in neonatal period range from transient self-limiting conditions to serious dermatoses requiring specific therapies. They can cause significant psychological distress to parents. The awareness of the fact that most of these conditions are benign and transient is important so that parents can be reassured. Since studies on neonatal dermatoses are limited, this study has been planned to know the spectrum of cutaneous lesions in neonates, both physiological and pathological.

MATERIALS AND METHODS: All neonates <28 days old, attending KLEs Dr. Prabhakar Kore Hospital and MRC, Belgaum, were recruited into the study. Newborns admitted in the Neonatal Intensive Care Unit were excluded from the study. A written informed consent was obtained from the mother. The study design was nonrandomized cross-sectional study. A sample size calculation was done using the Chi-square test. Analysis of data was performed by STATA 11.2. An Ethical Committee clearance was obtained before the start of the study.

RESULTS: One hundred and four neonates were enrolled in the study, out of which 49 (47%) neonates were male and 55 (53%) were female. Fifty-one (49%) neonates were born through normal vaginal delivery and 53 (51%) by cesarean section. Three (2.88%) neonates were born preterm, 5 (4.81%) post-term, and 96 (92.31%) neonates were born at term. Ninty-nine (95%) had physiological changes and 5 (5%) had pathological changes. The most common physiological change observed was mongolian spot in 34 (33%) of neonates followed by erythema toxicum neonatorum in 27 (26%) neonates and physiological desquamation in 21 (20%). Other less common physiological skin changes observed were milia, miliaria, hypertrichosis lanuginosa, vernix caseosa, and sebaceous gland hyperplasia. Pathological skin changes were observed in only five neonates, out of which one had bullous impetigo, one had birth trauma, 1 had furunculosis, 1 had intertrigo, and 1 was a collodion baby.

Conclusion : Skin changes in newborn are very common. However, majority are physiological and transient requiring no treatment.

Keywords:

Dermatoses, mongolian spot, neonates, pathological, physiological

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Introduction

Neonatal period encompasses the first 4 weeks of extrauterine life.[1] During this time, the skin undergoes rapid adaptation to assume an important role of defense barrier and thermoregulation.[2] Skin lesions have been found in around 94%–96% of neonates in various studies published worldwide.[2,3] They may range from benign and transient self-limiting conditions to severe, life-threatening disorders. Various factors such as race, nutrition, hygiene, socioeconomic status, maternal factors, heredity, climate, etc., influence the pattern of skin changes in the newborn.[2] A broad classification of skin lesions in newborn includes physiological conditions, transient eruptions, birthmarks, cutaneous infections, and inherited disorders.[2]

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Majority of the skin changes in neonates are physiological and transient requiring no treatment. However, these cause undue concern to the parents as well as to the pediatricians who may be unfamiliar with these skin changes.[3]

Some lesions may occur as cutaneous manifestations of potentially life-threatening systemic disorders, so early diagnosis is crucial to initiate specific therapy at the earliest.[4]

Materials and Methods

This nonrandomized cross-sectional study was conducted between January 2016 and December 2016 by the Department of Dermatology, Dr. Prabhakar Kore Charitable Hospital, Belagavi after obtaining Institutional Ethical Committee clearance.

All the neonates were enrolled for the study on a random basis from the postnatal ward and from the skin outpatient department. Newborns admitted in the Neonatal intensive care unit (NICU) were excluded from the study.

A detailed history was obtained from the mother with regard to the age and mode of onset of the skin lesions, any significant antenatal or postnatal history, birth order of the baby, and mode of delivery. The neonates were examined thoroughly from top to bottom to look for any signs of skin lesions, including a detailed examination of the hair, nails, and mucosal sites along with a general physical examination of the vital signs.

Statistical analysis

The statistical analysis was performed by STATA 11.2 (College station TX, USA). Chi-square test was used to measure the association between the cutaneous findings (physiological and pathological) and maturity, birth order, gender, and birth weight. $P < 0.05$ was considered as statistically significant.

Results

A total of 104 neonates were enrolled in this study, out of which 49 (47%) neonates were male, and 55 (53%) were female. 51 (49%) neonates were born through normal vaginal delivery and 53 (51%) through cesarean section. Three (2.88%) neonates were born preterm, 5 (4.81%) post-term, and ninety 6 (92.31%) neonates were born at term. Eighteen (15%) neonates were underweight, i.e., <2.5 kg. Forty-six (44.23%) neonates were first born and out of the remaining 58 (55.77%): 40 (40.38%) were second born, 13 (12.5%) were third born, and 3 (2.88%) were fourth born. Eighty-eight (85%) neonates belonged to early neonatal period, i.e., <7 days old and 16 (15%) belonged to the late neonatal period (7–28 days).

Out of 104 neonates, 99 (95%) had physiological changes [Graph 1] and 5 (5%) had pathological changes [Graph 2]. The most common physiological change observed was Mongolian spot (MS) which was found in 34 (33%) neonates [Figure 1] followed by erythema toxicum neonatorum (ETN) which was seen in 27 (26%) neonates [Figure 2] and physiological desquamation (DS) of the skin which was seen in 21 (20%) neonates [Figure 3]. Other less commonly noted findings were milia (ML), miliaria (MLR), hypertrichosis lanuginosa (HL), congenital melanocytic nevi (CMN), sebaceous gland hyperplasia (SGH), and vernix caseosa (VC).

Among pathological changes, 1 (0.96%) neonate had bullous impetigo, one had birth trauma, one collodion baby [Figure 4], one had furunculosis, and one neonate had intertrigo [Table 1].

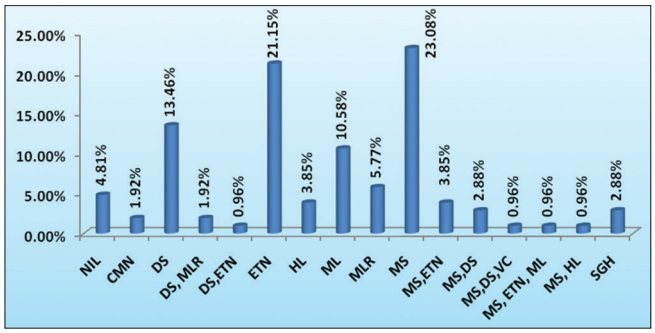
Discussion

In the present study, MS was found to be the most common neonatal dermatosis, seen in 34 (33%) out of 104 neonates. MS was also found to be the most common dermatosis in a study done by Jain *et al*. (incidence-45%)[5] and Zagne and Fernandes (incidence-50.74%).[6] The incidence of MS ranges from 20.1% to 84.7% according to various studies.[5-10] This marked variation may be due to the racial difference in the incidence of MS.[11] In our study, MS was observed more commonly in neonates with low birth weight (i.e., <2.5 kg) and this association was found to be statistically significant ($P = 0.029$). However, in a study done by Basnet *et al*.[7] and Kurrey *et al*.,[8] MS was found to be more common in neonates with a birth weight more than 2.5 kg.

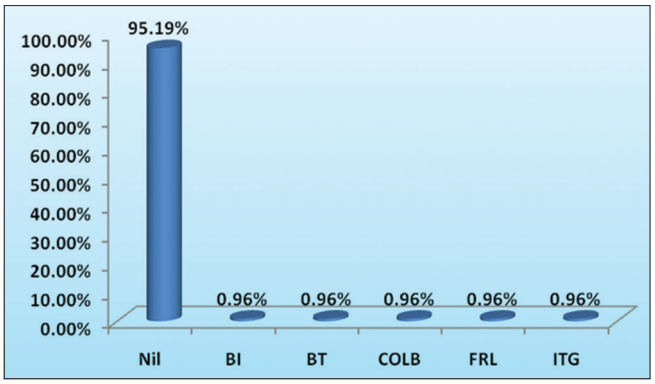
ETN was found in twenty-seven (26%) neonates out of 104. The incidence is similar to the findings in studies done by Haveri and Inamadar[3] and Jain *et al*.[5] where the incidence of ETN was found to be 23.2% and 23.33%, respectively. The frequency of ETN varies from 1.3% to 46.8% in various studies.[3,5,12,13] A significant correlation between ETN and normal birth weight (>2.5 kg) was noted by us. This is similar to a study done by Kurrey *et al*.[8]

DS of the skin was noted in twenty-one (20%) neonates out of 104, which was more or less in accordance with the finding of 22.73% observed by Gokdemir *et al*.[10] The incidence of physiological DS as observed in other studies varied from 7.2% to 83%.[14-18]

The incidence varies depending on the day of the examination, being more in studies where babies were followed up for more than 5 days. The day of



Graph 1: Physiological changes



Graph 2: Pathological changes

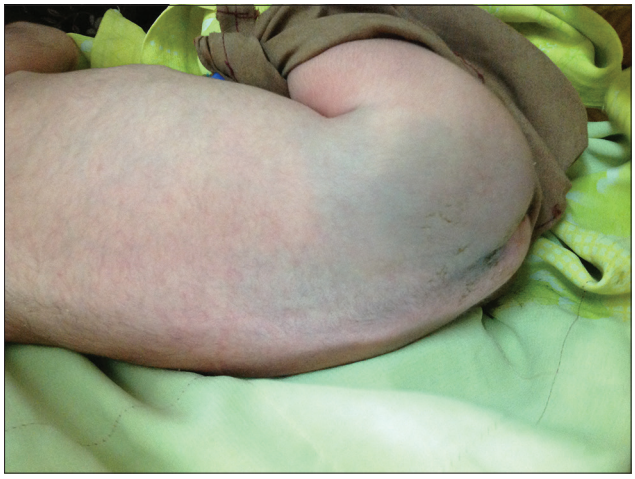


Figure 1: Mongolian spot

Figure 2: Erythema toxicum neonatorum

Figure 3: Physiological desquamation

Figure 4: Collodion baby

examination (5th–7th day) and the onset of physiological DS showed statistical significance.[19]

ML was noted in 10 (9.6%) neonates out of 104. The prevalence of ML as reported by the previous studies varied from 7.5% to 36%.[18,20,21]

In this study, MLR was present in 9 (8.65%) out of 104 neonates. In other studies, the incidence of MLR ranged from 1.7% to 28.3%.[2,5,15,22] The frequency of MLR was observed to be 1.7% in American neonates[23] and 4.5% in Japanese newborns.[21] This difference in frequency might be due to the different climatic conditions. Second, Indian cultural and social practice of overwrapping the babies, use of massage oils, and heat therapy might also be responsible for this

Table 1: Summary of skin changes observed: Both physiological and pathological

Skin changes	Number of cases (%)
MS	34 (32.69)
ETN	27 (25.96)
Physiological DS	21 (20.19)
ML	10 (9.62)
MLR	9 (8.65)
HL	5 (4.81)
SGH	3 (2.89)
CMN	2 (1.92)
VC	1 (0.96)
Bullous impetigo	1 (0.96)
Birth trauma	1 (0.96)
Collodion baby	1 (0.96)
Furunculosis	1 (0.96)
Intertrigo	1 (0.96)
More than one dermatosis (overlap)	13 (12.5)

MS: Mongolian spot, ETN: Erythema toxicum neonatorum, ML: Milia, MLR: Miliaria, HL: Hypertrichosis lanuginosa, SGH: Sebaceous gland hyperplasia, CMN: Congenital melanocytic nevi, VC: Vernix caseosa, DS: Desquamation

difference. Racial differences in the distribution and number of eccrine sweat glands might be an another factor for this difference.[24]

SGH was observed in three neonates (2.88%) out of 104. This was similar to a study done by Shehab *et al*.[23] where the incidence was 3%.

In the present study, HL was observed in 5 (4.8%) out of 104 neonates. The incidence of lanugo hair observed in other studies varied from 7% to 14.6%.[10,14,15]

Other less common conditions observed in this study were physiological changes such as CMN in 2 (1.92%) neonates and VC in 1 (0.96%) neonate; and pathological changes such as bullous impetigo in 1 (0.96%), birth trauma in 1 (0.96%), collodion baby in 1 (0.96%), furunculosis in 1 (0.96%), and intertrigo in 1 (0.96%) neonate each, respectively.

Conclusion

On the basis of our findings, the following conclusions were made:

Physiological changes were found in the majority of our cases, i. e., 99 (95.19%) and pathological changes in 5 (4.81%) cases.

The most commonly observed physiological change was the MS in 34 (33%) neonates. There was a statistically significant association between MS and low birth weight (<2.5 kg).

The second most common physiological change was ETN seen in 27 (26%) cases. We found a statistically significant association between ETN and normal birth weight (>2.5 kg), as well as with gender, i.e., it was more commonly observed among males in this study.

The third most common change observed was physiological DS in 21 (20%) neonates.

Although skin changes in neonates are common, the majority are benign and transient and require no treatment. The parents and caretakers need to be reassured about the self-limiting nature of these lesions.

Although not seen in our study, more serious cutaneous lesions such as erythroderma, infections such as staphylococcal scalded skin syndrome (SSSS), genodermatosis such as epidermolysis bullosa and collodion baby, etc., may occur. In such cases, early and correct diagnosis with the prompt institution of appropriate treatment may be lifesaving.

The limitation of our study is the small sample size; hence, a study with a bigger sample size needs to be done to validate the findings of our study. Another limitation was the inability to include those in the NICU which could be the cause of lack of cases of SSSS, erythroderma, etc., in our study.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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