Physiological skin changes in neonates –A cross sectional prospective study

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ABSTRACT

Introduction: The neonatal period is regarded as the first 4 weeks of extrauterine life. In the literature, there are numerous articles about the skin findings in neonates and the results of these studies show differences according to races and environmental factors.

Aims & Objectives: Our objective was to evaluate the physiological skin lesions seen in neonates delivered in our hospital and to determine their relationship to various perinatal factors.(gender, gestational age and route of delivery).

Materials & Methods: Newborns delivered at and attending pediatric OPD in our hospital from March 2012 to February 2013were included in this study. Dermatologic examination was performed and relationship between the skin changes and gender, gestational age and route of delivery were statistically evaluated.

Results: A total of 300 newborns were examined for the presence of skin lesions. Most common skin findings were Mongolian spot (46.66%), followed by Epstein pearls (38.66%) and physiological desquamation (28.66%) and the differences were statistically significant.

Conclusion: We found that 95% of the neonates had one or more cutaneous lesions. Birth weight, Maturity and type of delivery of the babies were important factors in their causation. With this study, we want to increase the awareness about the skin findings in neonates.

Keywords: Neonates, Physiological skin lesions, mangolian spots

INTRODUCTION

The neonatal period is period of rapid adaptation in which the skin plays an important role and assumes for the first time its function as a barrier and of thermoregulation[1] The most commonly detected lesions are transient as a result of Physiological response and limited to the first few days or weeks of life. Therefore, these conditions are rarely examined by dermatologists. However, it is important to identify them correctly to avoid concerns of parents, gynaecologists and pediatricians as well as unnecessary diagnostic or therapeutic procedures.[2] There are very few reports in the Indian literature regarding neonatal dermatoses.[1] In view of these trends, present study was undertaken to study the prevalence and patterns of various dermatoses in neonates.

MATERIALS AND METHODS

300 neonates over a period of 1 year were selected irrespective of age, sex, socioeconomic status. The neonates were observed for the first 3 days of life or till discharge from hospital. Detailed history of the neonates age, sex, maturity, birth weight, significant maternal history and mode of delivery was noted. Relevant history of the mother like age, consanguity, parity etc was taken. Thorough general, physical, systemic and cutaneous examination done.

RESULTS

Of the 300 newborns, 166 (58.33%) were females and 134 (44.66%) were males. Of them, 207 (69%) were delivered by caesarean section and 93 (31%) were delivered by normal vaginal delivery. There were 251 (83.66%) term and 49 (16.33%) preterm deliveries. Of the term deliveries, 28 were IUGR babies. 222 (74%) newborns weighed more than 2. 5 kg, 67 (22.33%) neonates weighed between 1.5 - 2.5 kg , 8(2.66%) weighed between 1.5 - 1 kg and 3 (1%) neonates weighed less than 1kg.

The maximum number i. e. 251(83.66%) mothers were in the age group of 20-25 years, 13 (4.33%) mothers in the age group of less than 20 years and the remaining i. e. 36 (12%) mothers were in the age group of 26-40 years. 164(54.66%) mothers were multigravida and 136(45.33%) mothers were primigravida. 231(46. 2%) mothers had associated illness during pregnancy.

Table 1: Frequency of physiological skin conditions observed in the study

Skin Condition	Male	Female	Total (%)
Physiological Jaundice	28	35	63 (21%)
Acne	1	0	1 (0.3%)
Acrocyanosis	4	7	11 (3.7%)
Bohn Cysts	2	4	6 (2%)

Cradle Cap	13	12	25 (8.33%)
Cutis Marmorata	11	6	17 (5.7%)
Epstein Pearls	50	66	116 (38.7%)
ETN	13	13	26 (8.7%)
Harelequin Colour Change	1	1	2 (0.66%)
Lanugo	27	16	43 (14.3%)
Milia	28	29	57 (19%)
Miliaria	10	10	20 (6.7%)
Miniature Puberty	9	19	28 (9.3%)
Mongolian Spot	65	75	140 (46.7%)
Desquamation	29	48	77 (25.7%)
Salmon Patch	15	0	15 (5%)
SH	31	45	76 (25.3%)
TNP	1	1	2 (0.7%)
Vernix	6	7	13 (4.3%)

In present study, the commonest physiological change observed was Mongolian spot (46.66%), followed by Epstein pearls (38.66%) and physiological desquamation (28.66%). Neonatal acne (0.33%), Harelequin colour changes (0.66%) were least observed. Among all the physiological skin changes, Physiological Jaundice, Cutis Marmorata and Salmon Patches were found to be statistically significant with gestational age, which are all common in preterms. In our study sex of the child does not have signifant influence on physiological skin changes except for lanugo hair which was more common in males.Cutis marmorata, Lanugo hair and Mongolian spot were more common in low birth weight babies. Sebacious hyperplasia and salmon patch were more more observed in babies born to Primigravida.

DISCUSSION

Skin rashes are common in neonates and can cause parental anxiety. Many of these are transient and physiological, but some may require additional work up to rule out more serious disorders . Hence, it is important for the dermatologist to recognize these physiological states and to differentiate these from pathological states

In the present study, out of 300 neonates, 285(95%) had one or more cutaneous lesions. It is in concordance with study by Meenakshi et al[3] where 94. 8% neonates had one or more cutaneous lesion. Others[4] reported 100% frequency of cutaneous manifestations among newborns.

In current study, Mongolian spots were most frequently observed lesions, present in 140 (46.7%) neonates, whereas most of the studies noted Epstein pearls as the commonest physiological neonatal skin condition. It is evident that greater the degree of natural pigmentation, the higher is the occurrance of Mongolian spots in the new born.[5] Higher incidence in black babies, Asiatic babies and Mongolians point towards its racial variation.[5] In the present study, incidence was higher in babies with birthweight <2.5kgs.

The second most common condition noted was Epstein pearls, which is seen in 116 (38.66%) neonates in the current study. The incidence of Epstein pearls varied from 43% to 64.3% in various studies and was more common among whites.[1,6] These differences are due to varying length of time the neonates were followed.[6] we observed that, preterm (44.89%) and babies with birth weight <2.5 kgs (57.69%) had more incidence of epstein pearls than term (37.42%) and babies with birth weight >2.5 kgs(31.98%).

In the current study physiological desquamation of skin was observed in 77 (25.66%) neonates. The incidence of superficial cutaneous desquamation as observed in other studies varies from 7. 2%-83%.[1,6] These variations could be justified by differences in time of examination, follow-up period of the infants,[3,4] and terminology used; while some registries defined desquamation alone, others included xerosis and desquamation.[2] A higher incidence was observed in babies with birth weight <2.5 kgs (37.17%) than in babies with birth weight >2.5 kgs (21.62%).

There is an association between the disappearance of the vernix caseosa and the appearance of desquamation. In post-term neonates and those born by vaginal delivery, less of the body surface is covered by vernix and physiological desquamation is therefore more common.[7] As vernix caseosa diminishes, there is increased maceration of the stratum corneum in the uterus, increased transepidermal water loss, and a subsequent dehydration of the stratum corneum in the first days of life, thereby triggering desquamation.[8] A higher incidence was observed in babies with birth weight <2.5 kgs (37.17%) than in babies with birth weight >2.5 kgs (21.62%).

In present study, sebaceous hyperplasia was seen in 76 (25.33%) neonates. Almost equal incidence was observed in males (23.13%) and females (27.1%). Some studies noted higher incidence in males and proposed the possible reason of increased levels of circulating testosterone in male newborns along with the effect of maternal androgens, leading to increased activity of sebaceous glands.[9]

Different authors have found different associations of sebaceous hyperplasia in neonates, e.g. Moosavi and Hosseini[4] reported its association with infants maturity and found that this cutaneous manifestation was significantly more in full term neonates.

In the current study, Physiological jaundice was observed in 63 (21%) of the neonates. In our study preterm babies (51.02%) were more likely to suffer jaundice than term babies (15.13%). The probable reason could be immaturity of liver in preterms.A lower incidence was observed in babies with birth weight >2.5 kgs (11.26%) than in babies with birth weight <2.5 kgs (48.71%). This might be due to its higher incidence in preterm.

In the present study Milia is noted in 57(19%) of the neonates. In our study, preterms (24.4%), babies with birth weight <2.5 kgs (28.20%), babies born to primi gravida (22.05%) through NVD (23.6%) had more chance of getting milia.[3] In present study lanugo is observed in 43(14.33%) of the neonates. A higher incidence was noted in preterm babies (26.53%), babies with birth weight <2.5 kgs (26.9%). Exact reason for this association is not known. It could be possible that these babies are "small for dates" and the lanugo hair in them is not completely shed at the time of birth. In present study 28(9.33%) of the neonates showed miniature puberty. Meenakshi et al[3] noted almost similar incidence of 5. 6%.Slightly higher incidence was observed in babies with birth weight <2.5 kgs (15.38%) than in babies with birth weight > 2.5 kgs (7.2%).

Erythema toxicum neonatorum is noted in 26 (8.66%) of the neonates. The reported incidence varied from 4.5% to 72% in other studies. The differences in its frequency could be due to difference in time of examination, because ETN sometimes begins as late as the seventh day,[10] we probably have missed some of the infants who developed ETN after 96 hours of birth.[9]In current study, a slightly higher incidence was noted in males than in females. Reason for such an association is not clearly understood, but the increased level of adrenal and gonadal androgens in male newborns, may have a direct effect on hair follicle and on sebaceous glands, which are involved in pathogenesis of ETN.[11]

Cradle cap is seen in 25(8.33%) of the neonates in present study. According to the observations made in our study, the incidence of cradle cap was more in term babies (9.16%), babies with birth weight > 2.5 kgs (7.65%) similar with other studies.[3]

In present study 20(6.66%) of the neonates were observed to have miliaria. The incidence varied from 4.4% to 50% in other studies. The difference in incidence might be due to the different climate of various countries, cultural and social practices of overwrapping the babies. Racial differences in the distribution and number of eccrine sweat glands may be another factor for this difference.[9] In current study, term babies (7.56%), and babies with birth weight <2.5 kgs (8.97%) were observed to have more chance of developing miliaria. This might be due to the effect of body weight on the size and rate of sweat production in human eccrine sweat glands.

In present study, Cutis Marmorata is observed in 17 (5.66%) neonates. Preterms (20.4%) had more incidence of cutis marmorata. The reason for this might be due to impaired vasomotor response and immaturity of autonomic nervous system .In our study, Babies with birth weight <2.5 kgs (12.82%) had greater chance of developing cutis marmorata than babies with birth weight > 2.5 kgs (3.15%). This could be due to its higher incidence in preterms which is inturn related to birth weight.

Salmon patch is present in 5% neonates in our study. In a study conducted by Meenakshi et al[3] the incidence was observed to be 13. 8%. Based on our study results, salmon patch was more observed in preterm(22.44%) and babies born through CS to Primi (8.08) mothers and association was significant. 13(4.33%) of the neonates, who were all term babies were observed to have Vernix Caseosa in the present study.This was in contradiction to other studies where preterms had more chance of having vernix than terms.

11(3.66%) of the neonates have Acrocyanosis in the present study. Its incidence was lower in term babies (3.18%), babies with birth weight >2.5 kgs (2.25%) than in preterm (6.12%) and babies with birth weight < 2.5 kgs (7.69%). This might be due to impaired vasomotor response in preterms. In present study 6(2%) of the neonates have Bohn cysts. 2(0.66%) of the neonates have Harelequin colour change.

The incidence of TNP was 0.66% in the present study. In different studies varied from 2.2% to 4.4%. The difference observed in its incidence may be due to difficulties in differentiating TNP from ETN.[6] Only 1(0.33%) had neonatal acne in our study. Other reported the incidence of acne is more in males due to effect of maternal hormones.Sucking blisters were not observed in our study. One study[12] noted incidence of 4.5%.

CONCLUSION

Skin lesions are very common in neonatal period. Most of the skin lesions in this period are transient but pathological lesions are not very uncommon especially in our settings where hygienic conditions are not very healthy. So any cutaneous lesion during this period should be carefully examined and should be differentiated from more serious skin conditions. Majority of the neonates observed were born to the mothers between the age groups of 20 – 25 (83.7%) born out of c.s (69%) to multigravida (54.66%). Most of the neonates were females, term babies, weighing more than 2.5 kgs (74%).

19 different types of physiological skin conditions were noted in newborn.In the present study, the commonest physiological change observed was Mongolian spot (46.66%), followed by Epstein pearls (38.66%) and physiological desquamation (28.66%) . Neonatal acne (0.33%), Harelequin colour changes (0.66%) were least observed changes. Perinatal factors such as Parity, gestational age, mode of delivery, birth weight have an influence on the occurrence of physiological skin changes in newborn.

In males, the commonest skin changes were Mongolian spots(21.7%), Epstein pearls (11.7%) and sebaceous hyperplasia (10.3%). In females, physiological desquamation was more common than sebaceous hyperplasia.

Almost all physiological skin changes were common in terms except cutis marmorata which is common in preterms (3.3%), suggesting impaired vasomotor response and immaturity of autonomic nervous system.Other than physiological jaundice (12.7%), cutis marmorata (3.3%) and acrocyanosis (2%) , all the changes were commonly observed in babies with birth weight >2.5 kgs.

There was not much difference in the incidence of physiological skin changes based on parity of mothers. However, most of them showed slight preponderance in babies born to multigravida mothers except for sebaceous hyperplasia (15.7%) and salmon patch (3.7%) which were common in babies born to primigravida mothers.

The incidence of physiological jaundice was higher in Low birth weight babies (12.7%) than babies of appropriate gestational age.Cutis marmorata (3.3%) was also more commonly observed in lbw babies and preterm babies, suggesting impaired vasomotor response and immaturity of autonomic nervous system.Sebaceous hyperplasia (15.7%) and salmon patch (3.7%) were commonly observed in babies born to primi mother than in babies born to multigravida mother.

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How to cite this article : Sandhya R K , Shiny S, Pratap D V S. Physiological skin changes in neonates –A cross sectional prospective study.Perspectives in Medical Research 2018; 6(3):28-31.

Sources of Support: Nil,Conflict of interest:None declared