

Dermatoses profile and its correlation with maternal factors admitted among neonates admitted to a tertiary care hospital in Coastal South India

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[Abstract]

Introduction: Neonatal skin changes are frequent and are an important cause of parental distress seeking paediatric consultation. Majority of neonatal cutaneous lesions are transitory and self-limited. However, pathological lesions require treatment. It is of paramount importance to identify and diagnose them correctly to avoid unwarranted therapeutic interventions.

Aims: To study the frequency of physiological and pathological skin findings in neonates and determine their association with socio demographic factors and maternal co morbid conditions and obstetric profile.

Methods: A cross sectional study was carried out among 288 neonates, admitted in 3 tertiary care centres, for a period of 6 months. Neonates were examined for dermatoses and recorded in a preset proforma. The results were expressed as mean, standard deviation, and percentage. The association between the skin findings and several variables was tested using Chi-square test And Z test.

Results: The incidence of dermatoses was 80.9% (n=233) of which 81.5% (n= 190) were physiological and 6.9% (n=16) were pathological. Most common skin finding was Mongolian spots (47.6%). Bacterial infection (4.9%) was the common pathological lesion. Mongolian spots among infants born to mothers who underwent cesarean section, lanugo hair among low birth weight babies ($P<0.05$) and physiological desquamation in post term babies were common. Incidence of dermatoses among mothers above 25 years and in primigravida with normal course of pregnancy was high.

Conclusions: Physiological skin lesions in neonates are common. Factors like maternal age and comorbid illness were not significantly associated with cutaneous lesions. A detailed knowledge on the neonatal skin by dermatologists and pediatricians is essential for the diagnosis and management of these transitory skin conditions as they are a cause of major concern among parents.

Key-words: Dermatoses, Neonates, Physiological, Pathological, Mothers, Skin

[Article]

Introduction

The neonatal period is regarded as the first 4 weeks of extra uterine life. This period is one of rapid adaptation in which the skin provides physical protection and plays an important role by fully assuming for the first time its function as a barrier and of thermoregulation. Neonatal skin is thinner, produces fewer sweat glands and sebaceous gland secretions. ^[1] The new-born skin can present with a vast range of conditions, from benign diseases to life-threatening ones.

Dermatoses of the neonates can be classified as transient skin disorders, congenital disorders, acquired skin disorders and iatrogenic skin lesions.^[2]

Neonatal dermatoses are commonly seen both in healthy neonates as well as in those needing hospitalization at the neonatal intensive units, due to some disease. ^[3] The prevalence of Dermatoses in neonates is around 74.6% to 100%.^[4]

The majority of neonatal cutaneous lesions are usually physiological, transient, and self-limited. However, there are some pathological lesions which cause parental concern and anxiety. Therefore, it is important to identify and diagnose them correctly to avoid unnecessary diagnostic or therapeutic interventions. ^[5]

The importance of the study of the neonatal skin disorders is to recognize these skin lesions and differentiate it from the ones that necessitate an early intervention. The present study will be useful in understanding the types and distribution of cutaneous lesions and their interpretation would benefit the clinicians.

Objectives

1. To determine the frequency of physiological and pathological skin findings in newborns within the first four weeks of life.
2. To determine the association between socio demographic factors and neonatal skin conditions.
3. To assess the relation between maternal co morbid conditions and obstetric profile with neonatal skin conditions.

Subject and Methods

A descriptive, cross sectional study was conducted in 3 tertiary care hospitals attached to a medical college for 6 months. Institutional ethical clearance was obtained. After taking informed consent from the mothers or guardians, all hospitalized neonates during the study period of 6 months were included. All neonates immobilized at the Intensive Care Unit (ICU) and mothers not willing for examination of their baby were excluded from the study. The neonates were examined thoroughly including general physical, systemic, and dermatological examination and all details were recorded in a preset proforma. The entire skin surface, including the scalp, mucous membranes and nails of the neonate was examined and all dermatological findings were noted. All physiological and pathological skin changes were observed, recorded, and analysed. The photographs of various skin lesions were taken and documented. The relevant history from the mother was documented in a pre-prepared proforma.

Data analysis

The obtained data was entered and analysed using SPSS [Statistical Package for Social Sciences] version 11.5. The results were expressed using descriptive statistics like mean, standard deviation and percentages. The association between the socio-demographic factors, maternal co morbid conditions and obstetric profile with the neonatal skin findings was analysed using Chi Square test and Z test was applied to find out the difference in proportion of cutaneous lesions between the various groups (male v/s female, Normal birth weight v/s Low birth weight, caesarean delivery v/s vaginal delivery). $P < .05$ was considered to be statistically significant.

Results

A total of 288 babies were included in this study of which 53.1% were male babies and 46.9% were female babies. Majority (72.9%) were delivered by caesarean section. Twenty one percent had low birth weight and 6.9% were preterm. Cutaneous lesions were observed in 233 babies (80.9%).

At least one skin lesion was found in 33.5% (n=78) neonates and 66.5% (n=155) had 2 or more lesions. Of these 81.5% (n=190) had physiological lesions, 6.86% (n=16) had only pathological lesions and 11.58% (n=27) had both physiological and pathological lesions. The most commonly observed physiological skin lesion was Mongolian spots (47.6%), more frequent in term neonates and located on the buttocks. Epstein pearls were seen in 27.4% neonates and mostly located on the palate. Sebaceous hyperplasia was observed in 17.7% neonates followed by Salmon patch in 13.9% neonates.(Table 1)

Among the neonates with pathological lesions, bacterial infection was the most common (4.9%) followed by fungal infections (3.8%).

Table 1: Description of cutaneous lesions (N=233)

Types of lesions	n (%)
Congenital lesions	
Mongolian spot	137(47.6)
Salmon patch	40(13.9)
Congenital melanocytic nevus	12(4.2)
Transient skin lesions	
Epstein pearls	79(27.4)
Sebaceous hyperplasia	51(17.7)
Milia	33(11.5)

Lanugo hair	27(9.4)
Physiological Desquamation	21(7.3)
Erythema Toxicum Neonatorum	11(3.8)
Acrocyanosis	5(1.70)
Acquired skin disorders	
Impetigo	14(4.9)
Candidiasis	8(2.80)
Miliaria	5(1.7)
Diaper rash	2(0.7)
Seborrheic dermatitis	1(0.3)
Iatrogenic	
Iatrogenic bruises	6(2.1)

Table 2. presents the distribution of cutaneous lesion among neonates across gestational age. Among neonates with cutaneous lesions, Mongolian spots were the most common lesions found among both boys and girls followed by Epstein pearls.

Mongolian spots, milia, salmon patch, sebaceous hyperplasia, lanugo hair were more frequent in boys with skin lesions ($P>0.05$). Physiological desquamation, erythema toxicum neonatorum and fungal infection was more frequent in girls with skin lesions ($P>0.05$). Epstein pearls, acrocyanosis and nevi were equally found in both boys and girls.

Table 2: Distribution of cutaneous lesion among neonates across gestational age [N=233]

Cutaneous lesions	Gestational age		
	Preterm [N=19]	Term [N=209]	Post term [N=5]
	n(%)	n(%)	n(%)
Mongolian spots	1(5.26)	134(64.1)	2(40)
Epstein pearls	6(31.6)	72(34.44)	1(20)
Sebaceous Hyperplasia	00(00)	51(24.4)	0(00)
Salmon patch	00(00)	39(18.7)	1(20)
Milia	3(15.8)	28(13.4)	2(40)
Lanugo hair	12(63.2)	15(7.17)	0(00)
Physiological Desquamation	1(5.26)	15(7.17)	5(100)
Congenital Melanocytic Nevus	2(10.5)	09(4.3)	1(20)
Acrocyanosis	00(00)	5(2.39)	0(00)
Erythema Toxicum Neonatorum	1(5.26)	10(4.78)	0(00)
Bacterial Infection	00(00)	14(6.69)	0(00)
Fungal Infection	2(10.5)	8(3.82)	1(20)
Miliaria	00(00)	4(1.91)	1(20)
Iatrogenic bruises	1(5.26)	5(2.39)	0(00)

Mongolian spots, Epstein pearls, sebaceous hyperplasia, salmon patch, milia, miliaria, physiological desquamation, and nevi were frequently seen in babies who weighed more than 2.5 kg ($P<0.05$). Among babies who were low birth weight, lanugo hair was most commonly seen. ($P<0.05$)

Mongolian spots, Epstein pearls, sebaceous hyperplasia, desquamation, lanugo hair, and milia were more common in babies born by caesarean section compared to babies born by vaginal delivery ($P<0.05$).

Table 3: Factors Associated with Dermatoses.

Factors		Dermatoses		Chi square (p value)
		Present	Absent	
		N= (233), n (%)	N= (55), n (%)	
Age of neonate	< 7 days	194(83.3)	44(80)	0.330
	>7 days	39(16.7)	11(20)	
Sex of baby	Male	123(52.7)	30(54.5)	0.055
	Female	110(47)	25(46.3)	
Birth weight of baby (kg)	NBW*	180(77.4)	47(87.2)	1.613
	LBW*	53(22.6)	8(14.8)	
Gestational age	Pre term	19(8.1)	1(1.9)	4.243
	Post term	209(89.3)	53(98.1)	
		5(2.1)	1(1.9)	
Age of mother (years)	< 25	108(46.4)	31(56.4)	1.786
	>25	125(53.6)	24(43.6)	
Parity	Primi	115(49.4)	38(69.1)	6.959
	Multi	118(50.6)	17(30.9)	
Mode of delivery	LSCS*	175(75.1)	35(63.6)	2.965
	Vaginal	58(24.9)	20(36.4)	
Consanguinity	Yes	6 (2.6)	0(0.0)	1.446
	No	227(97.4)	55(100)	
Smoking status of mothers	Yes	32(13.7)	1(1.8)	6.227
	No	201(86.3)	54(98.2)	
Pregnancy complications	No	195(84.1)	195(84.1)	0.886
	Yes	49(89.1)	49(89.1)	

NBW*-Normal birth weight, LBW*- Low birth weight, LSCS*- Lower section cesarean section

Table 3 demonstrates sociodemographic factors, obstetric profile and maternal comorbidity and its association with skin changes of newborns.

Skin changes were observed in 52.7% male and 47% female babies, 22.6% of babies with low birth weight showed dermatosis. Skin changes were frequently seen in 89.3% of term babies. None of these factors showed any statistically significant association with neonatal dermatoses.

Skin changes were demonstrated in 75.1% babies born via LSCS and 86.3% babies born to non- smoker mothers showed one or the other skin changes.

Even maternal factors such as maternal, gestational age, mode of delivery, consanguinity, smoking status and pregnancy complications like diabetes, hypertension, etc. did not show any statistically significant association with neonatal skin changes.

Discussion

Differentiating normal skin phenomenon from other serious cutaneous disorders is a critical step in neonatal examination and recognition of these dermatoses allows the physician to proceed appropriately, reassure the parents and initiate further evaluation or treatment.

In this study we found that Mongolian spots was the most common lesion seen and constituted the maximum of 137 (47.6%) cases. Similarly, a higher frequency (68.8%) has been reported in the study conducted by Nobby B and Chakraborty N^[1]. However, in their study the most common pathological skin lesion was erythema toxicum which is in contrast to our study where bacterial infections were more frequent. Studies reported by Gokdemir et al showed Epstein pearls (58.76%) to be the commonest lesions.^[5]

Mongolian spots have been shown to be good examples of inter-racial differences. Studies have demonstrated that Mongolian spots were significantly common among Asian and neonates of African origin.^[7] The difference may be due to racial variation and a greater degree of natural pigmentation and persistence of melanocytes in the affected area.

The present study revealed a relatively higher frequency of bacterial infection (14%), as compared to most of the similar international studies e.g. it was reported to be 0.02% in American newborns^[10] but another Indian study by Nanda et al^[9] found almost similar frequency of impetigo i.e. 11.3%. These differences can be explained on the basis of seasonal and temperature differences. Overcrowding, less efficient sterilization and cleanliness in the hospitals and poor standard of hygiene in the individuals can be the other factors contributing to increased frequency of impetigo in our population.

In this study we found that male babies (52.7%) outnumbered female babies (47%) in relation to the incidence of cutaneous lesions, although the difference was not statistically significant. It is consistent with the observations from the studies conducted by Sachdeva et al (55.9%)^[7], Nobby B (52.4%)^[1]. Fungal infection, erythema toxicum and physiological desquamation was more frequent in female babies in this study whereas in a study conducted in Turkey, milia and sebaceous hyperplasia were more common among female babies.^[5]

In relation to gestational age the present study revealed that the majority of the term babies born had maximum cutaneous lesions. Our observations are consistent with the studies conducted by Gokdemir et al (62%)^[5] and Sachdeva et al (90.2%)^[7]. Mongolian spots were the most frequent lesion seen among term babies. The cause of higher frequency of Mongolian spots in term babies is not known and the same has been reported from studies conducted by Sachdeva et al.^[7]

Physiological desquamation was more in post term infants though it was not statistically significant. Similar findings were seen in the study by Gokdemir et al.^[5] where it was statistically significant ($p < 0.05$). This may be due to a larger sample size in their study. The pathophysiology of this increase in post term babies is not known.

Lanugo hair was of higher frequency in preterm babies which concurred with the results of the study conducted by Jain et al (39%)^[6]

Analysis pertaining to birth weight revealed that maximum number of cutaneous lesions were seen among normal birth weight babies i.e. 77.4% ($n=180$). This is consistent with the studies conducted by Sachdeva et al.^[7]

Lanugo hair was more frequently seen in 66.7% of babies weighing less than 2.5 kg. It is comparable to the incidence observed by Sachdeva et al (61.2%)^[7]. A higher incidence in babies weighing less than 2.5 kg may be due to its preponderance in preterm babies.

The present study revealed an almost equal incidence of cutaneous lesions in both primigravida and multigravida i.e. 49.4% and 50.6% respectively. However in a study by Sachdeva et al^[7] 63% of cutaneous lesions were seen among multigravida. With regard to maternal age maximum cutaneous lesions was seen in mothers of the age group of 25-30 years (39%). But observations of the study conducted in Amritsar^[7] found that maximum number of

mothers (52.4%) were in the age group of 21-25 years and the least number of mothers (21.8%) were in the age group of 26-40 years.

In this study the presence of Mongolian spots, Epstein pearl and lanugo hair among neonates was significantly associated with mothers who underwent caesarean section. Our finding is in contrast to that of Sachdeva et al.^[7], who found an association between lanugo hair and vaginal delivery in their study.

With reflection to maternal illness in the present study out of 233 cases 15.9% (n=37) newborns born with maternal history of illness and 84% (n=195) were born with no history of maternal illness had cutaneous lesions.

In this study, factors like age of the newborn, age of the mother, gestational age, birth weight, maternal comorbid illness were not found to be significantly associated with presence of cutaneous lesions.

Conclusion

The study of the epidemiological profile of neonatal dermatosis and its correlation with maternal factors and obstetric profile helps in easy diagnosis of neonatal skin conditions and helps in preventing unnecessary intervention on the newborn skin.

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FIGURES:

Figure 1: Miliaria Rubra
Figure 2: Miliaria crystallina with pustulosa
Figure 3: Erythema Toxicarum Neonatum
Figure 4: Mongolian spots
Figure 5: Epstein pearls
Figure 6: Sebaceous hyperplasia
Figure 7: Congenital melanocytic nevus
Figure 8: Salmon patch with mosquito bite
Figure 9: Desquamation
Figure 10: Miliaria pustulosa
Figure 11: Miliaria pustulosa
Figure 12: Miliaria crystallina
Figure 13: Iatrogenic Trauma



Figure 1: Miliaria Rubra



Figure 2: Miliaria crystallina with pustulosa



Figure 3: Erythema Toxicarum Neonatum

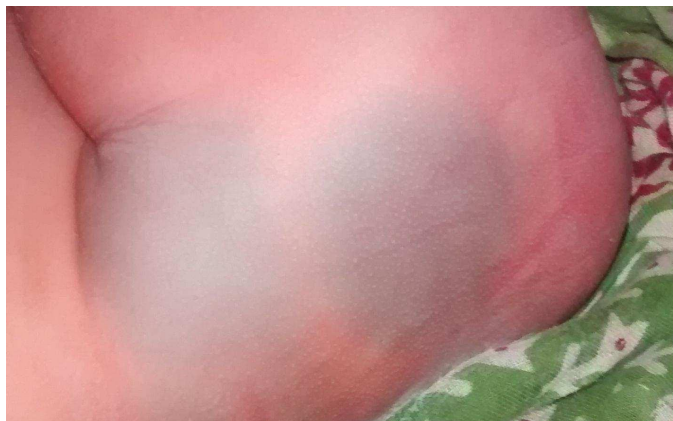


Figure 4: Mongolian spots

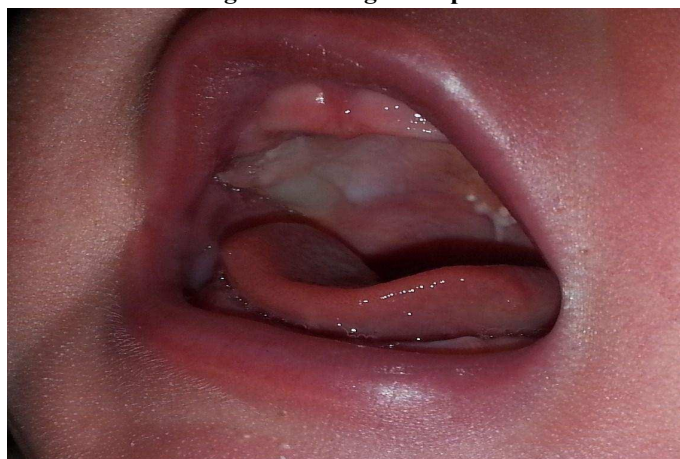


Figure 5: Epstein pearls

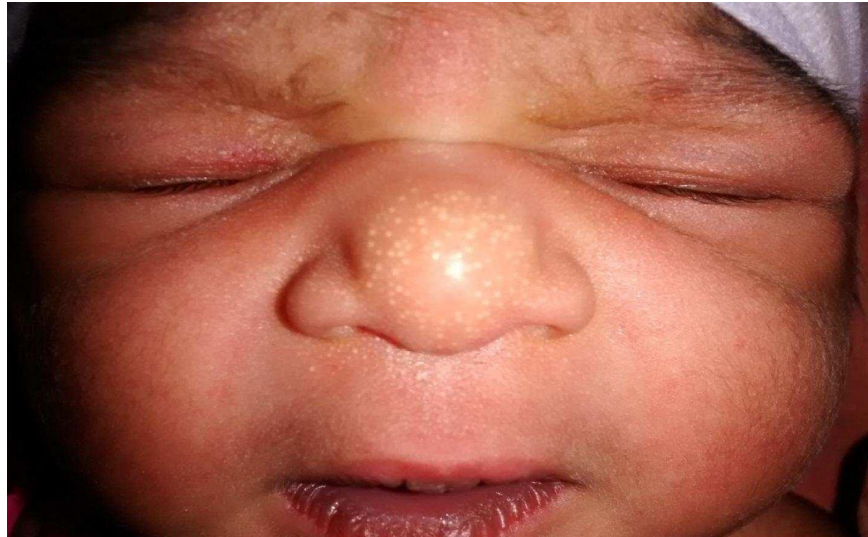


Figure 6: Sebaceous hyperplasia



Figure 7: Congenital melanocytic nevus



Figure 8: Salmon patch with mosquito bite



Figure 9: Desquamation



Figure 10: Miliaria pustulosa



Figure 11: Miliaria pustulosa



Figure 12: Miliaria crystallina



Figure 13: Iatrogenic Trauma