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A study of cutaneous manifestations in preterm neonates in a tertiary care centre in Srikakulam

Kirankanth Vudayana[1]*, Sappa Ramatulasi[2], Swamy Naidu Dasari[3], Jahnavi Chaduvula[4], Dilip Chandra Chintada[5], Sree Gowthami Indana[6], Swethana Sree Dharapalli[7]

[1]Associate Professor, Department of DVL, Great Eastren Medical School & Hospital, Ragolu, Srikakulam, Andhra Pradesh, India
[2]Associate Professor, Department of DVL, KIMS & RF, Amalapuram, EG, Andhra Pradesh, India
[3]Assistant Professor, Department of Peadiatrics, Great Eastren Medical School & Hospital, Ragolu, Andhra Pradesh, India
[4]Postgraduate, Department of DVL, Great Eastren Medical School & Hospital, Ragolu, Andhra Pradesh, India
[5]Assistant Professor, Department of DVL, Great Eastren Medical School & Hospital, Ragolu, Andhra Pradesh, India
[6]Senior Resident, Department of DVL, Great Eastren Medical School & Hospital, Ragolu, Andhra Pradesh,India
[7]Postgraduate, Department of DVL, Great Eastren Medical School & Hospital, Ragolu, Andhra Pradesh, India

Abstract
Background: The skin is a complex and dynamic organ that performs numerous vital functions. The maturation process, starts at birth with the adaptation of skin to the relatively dry environment compared to in utero milieu. Thus the skin of the preterm especially with low birth weight neonates is very delicate, immature, has weaker dermo-epidermal attachment which place them at higher risk of systemic dissemination from cutaneous. **Methods: Study design:** This is a cross-sectional study. **Study Center:** Neonatology Unit, Great Eastern Medical School and Hospital, Ragolu, Srikakulam. **Study Period:** 6 months SEPTEMBER 2019 to MARCH 2020. **Sample Size:** Sixty preterm neonates with cutaneous changes. **Results**: Out of 60 patients male to female ratio is 1.6. The most common presentation was Mongolian spot at lumbosacral area was found in 73%. The second most common physiological finding was physiological jaundice which was found in 66%. The third most common finding was milia which were present in 36 (60%) of babies. The fourth most common dermatoses was found to be epstein pearl which was present in 30(50%) of babies. **Conclusion:** The present study was conducted to know various dermatoses associated with newborn. We also studied the association of dermatoses with various physiological and pathological neonatal dermatoses and their prevalence.
Keywords: Preterm, Neonatal dermatoses, Mongolian spot Physiological jaundice

Introduction

The skin is a complex and dynamic organ that performs numerous vital functions. The maturation process, starts at birth with the adaptation of skin to the relatively dry environment compared to in utero milieu. This adaptive flexibility results in the distinctive properties of infant skin. To deliver proper care to infant skin, it is necessary to appreciate that it is evolving with unique characteristics [1].

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*Correspondence
Dr. Kirankanth Vudayana
Associate Professor, Department of DVL, Great Eastren Medical School & Hospital, Ragolu, Srikakulam, Andhra Pradesh, India
E-mail: kkmedico12@gmail.com

Maturation of skin starts during embryogenesis through intercellular and intracellular signals among different tissue layers. Barrier function development increases with gestational age and the epidermal maturation are complete by 34 weeks of intrauterine life [2].

During the skin barrier development,Impaired function makes the skin susceptible to chemical damage, microbial infections and skin diseases, probably compromising the general health of the newborn. Preterm newborn, during the 1st weeks of life, has an even less developed skin barrier and therefore is even more at risk.

Thus, it is exceedingly important to evaluate the risk of infections, topical agent absorption, skin barrier disruption and the risk of thermoregulatory failure.

Thus the skin of the preterm especially with low birth weight neonates is very delicate, immature, has weaker dermoepidermal attachment which place them at higher risk of systemic dissemination from cutaneous infections.

Most of the conditions develop more rapidly than in adults and are self-limiting. Although a host of the dermatoses in neonates is a result of the physiological phenomenon and transitory, its recognition and distinction from life threatening conditions are necessary to allay

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parent's anxiety and counsel them regarding its harmless nature. Some of the dermatoses or their variation in the clinical presentation may be the earliest marker of certain life threatening conditions eg: X-linked hypohidrosis ectodermal dysplasia present initially in the neonatal period with scaling of the skin.

Aim and objectives of the study
1. To evaluate various dermatoses in preterm newborns
2. To know the association of various dermatoses with birth weight, gestational age, and mode of delivery
3. To know any other systemic associations.
4. To know any unusual cutaneous manifestations.

Materials and methods
Study design
This is a cross-sectional study

Study Centre
Neonatology Unit, Great Eastern Medical School and Hospital, Ragolu, Srikakulam.

Study Period
6 months September 2019 to March 2020

Sample Size
Sixty preterm neonates with cutaneous changes.

Inclusion criteria
Preterm neonates born after 28 weeks and before 37completed weeks of gestational age with cutaneous changes.

Exclusion criteria
1. Preterm neonates without cutaneous changes.
2. Term and post-term neonates.
3. Parents not willing the study

60 preterm neonates with cutaneous changes were randomly selected for the present study among the babies born in Great Eastern Medical School and Hospital, Ragolu, Srikakulam from September 2019 to March 2020 for 6 months. Maternal history like history of consanguinity, age, parity comorbidities like diabetes, hypertension, CT disorders, history of infection, radiation exposure were noted. Any antenatal procedure or investigations VDRL, VCTC status were obtained.General physical examination, systemic examination, complete dermatological examination including scalp, hair, nails,

palms and soles, genitalia, and mucosa of preterm neonates was done to record both the physiological and pathological conditions.
Simple non-invasive investigations like KOH mount for candida infection, Tzanck smear gram stain, darkfield microscopy, and pus culture were done in needed cases to confirm the dermatological diagnosis.
Blood investigations like full blood count, liver function test, imaging studies, and other investigations were done in selected cases depending on the clinical diagnosis to confirm it and to rule out any systemic involvement

Statistical analysis
The collected data were analyzed with IBM.SPSS statistics software 23.0 Version. To describe the data descriptive statistics frequency analysis, percentage analysis was used for categorical variables and the mean & S.D were used for continuous variables. To find the significance in categorical data Chi-Square test was used similarly if the expected cell frequency is less than 5 in 2×2 tables then the Fisher's Exact was used. In both the above statistical tools the probability value .05 is considered a significant level.

Ethical issues
Neonates' parents were made of about the nature and purpose of the study. It was also informed to all the parents that all data provided by them will be kept confidential and will be used only for the study purpose. Willingness and signature were taken on a previously designed consent form. Written consent were obtained from all the parents who participated in the study before data are collected. A Detailed description of the study and the aspects of patient confidentiality are explained to them and voluntary participation is sought. The Institutional ethics committee of Great Eastern Medical School and Hospital, Ragolu, Srikakulam reviewed the study proposal for ethical consideration, and approval of the committee was obtained before the study.

Observation and results
The present study was conducted at GEMS and HOSPITAL for a period of 6 months from September 2019 to March 2020 with a sample size of 60. The minimum gestational age of the neonate was 29 weeks and the maximum was 36 with a mean of 34 weeks. The female to male ratio was 1.6. Regarding mode of delivery, 65% were delivered by C-Section and 35% by Normal Vaginal Delivery.37% were born on or before 34 completed weeks and 43% were born later.70% of neonates had birth weight <2kg ; 25% had birth weight between 2 and 2.5kg ; 4% had birth weight >2.5kg.
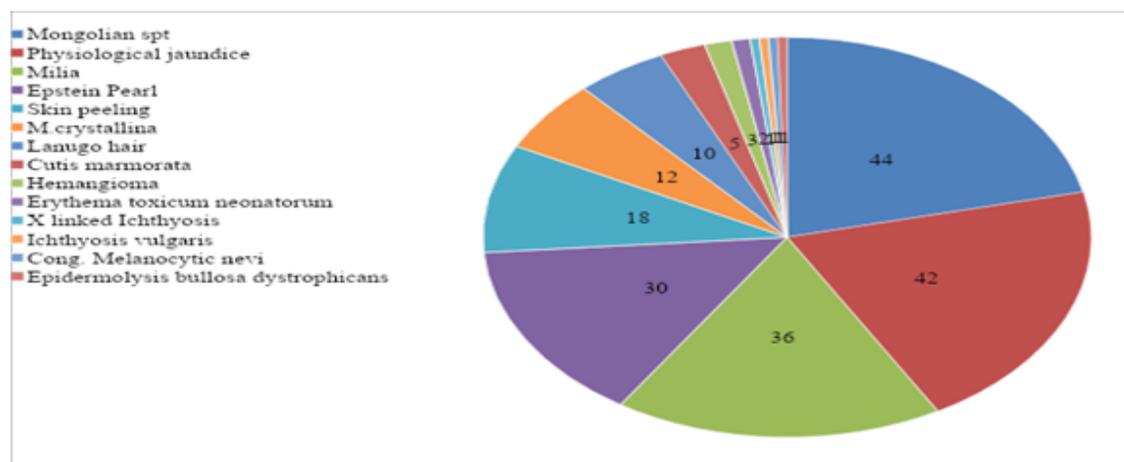

Fig 1:Results of the study

Table 1: Incidence of Various Dermatoses Observed in The study Group

Sl no	Dermatoses	No. of babies (n)	(%)
1	Mongolian spot	44	73.3
2	Physiological jaundice	42	66
3	Milia	36	63
4	Epstein Pearl	30	40
5	Skin peeling	18	33
6	M. crystalline	12	32
7	Lanugo hair	10	14
8	Diaper dermatitis	6	10
9	Cutis Marmorata	5	8.3
10	Hemangioma	3	1
11	Erythema toxicum neonatorum	2	1
12	X linked Ichthyosis	1	1
13	Ichthyosis Vulgaris	1	1
14	Cong. Melanocytic nevi	1	1
15	Epidermolysis bullosa dystrophicans	1	1

Other most common findings were M.crystallina(20%) ,lanugo hair(16.66%),diaper dermatitis(10%) and cutis marmorata(8.33%).

Physiological and Transient Conditions

Table 2: Mongolian spot

	Gestational Age		Sex		Birth weight (kg)		
	≤ 34wks	> 34wks	M	F	≤ 2	2 to2.5	>2.5
Number of Babies	25	19	17	27	34	9	1
Percentage	56.8	4.4	38.6	61.3	77.2	23.4	2.2

(M- male, F- female)
The most common presentation was Mongolian spot at lumbosacral area. It was found to be more common in female babies with weight < 2kgs. There were found to be no significant associations between gestational age, sex and birth weight with Mongolian spots.

Table 3: Physiological Jaundice

	Gestational Age		Sex		Birth weight (kg)		
	≤ 34wks	> 34wks	M	F	≤ 2	2 to2.5	>2.5
No of babies	30	12	17	25	34	7	1
Percentage	71.4	27.2	40.47	59.5	80.9	16.66	2.3

The second most common physiological finding was physiological jaundice which was found in 10 percent babies. It was more common in babies with gestational age< 34 weeks (71.4%) ,female(59.5%) and < 2kg birth weight (80.9%).The association with the gestational age and birth weight was found to be significant.

Table 4: Milia

	Gestational Age		Sex		Birth weight (kg)		
	≤ 34wks	> 34wks	M	F	≤ 2	2 to2.5	>2.5
No of babies	20	16	15	21	26	8	2
Percentage	55.5	44.44	41.66	58.33	72.22	22.22	5

The third most common finding was milia which were present in 36 (60%) of babies. It was found to be more common in babies with birth weight<2kg(72.22%).There was found to be no significant association with milia and the other 3 parameters.

Table 5: Epstein pearl

Epstein pearl was seen in 40 (40%) neonates.

	Gestational Age		Sex		Birth weight (kg)		
	≤ 34wks	> 34wks	M	F	≤2	2 to2.5	>2.5
No of babies	19	11	9	21	22	6	2
Percentage	63.33	36.66	30	70	73.33	20	6.6

The fourth most common dermatoses was found to be epstein pearl which was present in 30(50%) of babies. It was found to be more common in female sex (73.33%).The association was found to be non significant.

Table 6: Skin peeling

	Gestational Age		Sex		Birth weight (kg)		
	≤ 34wks	> 34wks	M	F	≤ 2	2 to2.5	>2.5
No of babies	10	8	7	11	5	11	2
Percentage	55.55	44.44	36.4	63.6	69.7	24.2	6.1

The fifth most common was found to be skin peeling was present in 18(30%) babies.It was most common in female sex(61.11%) and more common in babies with birth weight 2-2.5kg (61.11%).There was no significant association between all the parameters.(p>1.0)

Table 7: Milaria Crystallina

Milaria Crystallina occurred in 32% of the preterm babies

	Gestational Age		Sex		Birth weight (kg)		
	≤ 34wks	> 34wks	M	F	≤ 2	2 to2.5	>2.5
No of babies	7	5	4	8	8	3	1
Percentage	58.33	41.66	33.33	66.66	66.6	25	6

A higher percentage was seen in babies with ≤ 34 weeks of gestational age (58.33%) and birth weight of less than or equal to2kg (66.6%), more in female babies(66.66%)

Table 8: Lanugo Hairs

	Gestational Age		Sex		Birth weight (kg)		
	≤ 34wks	> 34wks	M	F	≤ 2	2 to2.5	>2.5
No of babies	9	1	5	5	8	1	1
Percentage	90	10	50	50	80	10	10

Male and female babies with this condition were 50% and 50% respectively.8 (80%) neonates had a birth weight of 2- 2.5 kg.

Fig1: Milaria crystallina

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Fig2:Candidial Intertrigo

Fig3: Erythema Toxicum Neonatorum

Fig4: Epidermolysis bullosa

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Fig5:Lanugo hair

Discussion

This study was conducted to know various pathological and physiological manifestations in newborns at a tertiary care center and their prevalence.

In the present study, the most common presentation was noted to be Mongolian spot which was noted around 73.3% of new born. This was on par with other studies which were previously conducted in India.[3,4,5]. It was found to be more common in female sex with birth weight <2kgs.It was noted that majority of lesions present in the lumbosacral area and found to be common in babies born to mothers suffering from GDM.But this correlation was not found to be significant in the present study and other studies by Dash K

The second most findings were noted by physiological jaundice, which was found in 70% babies to be more common in babies <2.5 kgs birth weight, as the association was also noted to be significant may be due to immature blood cells.Milia was noted to be the most common which was noted in 60% of babies which was found to be higher in incidence which was compared to studies conducted by Visalakshi et al[6,7],Kulkarni et al

In the present study, Epstein pearls were found to be frequent observation in 50% of babies which was nearly comparable to studies conducted by Kulkarni et al Nobby et al[8] . This was found to be more common in female sex with birth weight <2kg which was not found to be statistically significant.

Physiological scaling is benign superficial desquamation,which was noted present in 30% of babies which was with in literature range[9,10].The frequency of M.crystallina was noted to be 20%, which was comparable to studies done earlier which showed a range 6 between 1.8-20%.

Lanugo hair was noted in 16.66% of babies, which was comparable to study done by Nobby et al.80% of these babies were preterm babies which were reported in other studies.

Conclusion

The present study was conducted to know various dermatoses associated with newborn. We also studied the association of dermatoses with various physiological and pathological neonatal dermatoses and their prevalence.

This will help us to know various pathological dermatoses and the investigations and management required.To know the physiological conditions and to inform the parents about the conditions and relieve their anxiety. It also helps us to get rid of unnecessary therapy for neonates.

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