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STUDY OF SKIN CONDITION IN NEWBORN

Dermatology

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ABSTRACT

Introduction: Many of the skin lesions observed in a newborn are regarded as physiological, but no sharp line divides the normal from the abnormal. But incidence and prevalence of those conditions is not well known .
Aim: To Study incidence skin conditions or lesion in newborns and analyse the effect of maternal factors, events during pregnancy, consanguinity, mode of delivery, maturity & birth weight of newborns.
Material and methods: A total no of 1000 neonates were examined from post-natal ward of Tertiary care hospital after taking consent from Parents
Conclusion: The commonest manifestation observed was the Mongolian spot, followed by Epstein pearl, sebaceous hyperplasia, milia, erythema toxicum neonatorum, sucking callus, physiological desquamation, miliaria, cutis marmorata.

KEYWORDS

Newborn, Skin lesions, Mangolian spots, Epstein pearl , Sebaceous Hyperplasia.

INTRODUCTION

The neonatal period is a period of transition from Intrauterine to extrauterine life, in which the skin begins to take over its role as temperature regulator and as a barrier against infection. The varying balance between the maturity and functional efficiency of the skin determines the varied response it provides to external environmental changes, which in turn manifest as wide morphological variations observed in the skin of the newborn. Many of the skin lesions observed in a newborn are regarded as physiological, but no sharp line divides the normal from the abnormal. Cutaneous manifestations vary in frequency, type of presentations, site of occurrence and morphological features. The variations depend on several factors like study population, geographical location, climate, nutrition, hygiene, socioeconomic status. These cutaneous manifestations may be a cause of great concern among parents. They may even be misleading for a great number of medical personnel's as well. Some of these are of great significance as they are the markers of serious underlying disorders like Neurocutaneous syndromes [1] and metabolic disorders. [2]

The available literature from India in this regard is limited [3- 6]. Literature available from abroad[7-10] shows the differences in the incidence of various lesions in different parts of the world. The present study was undertaken to find out the physiological observations and organic skin conditions affecting the neonates.

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MATERIAL AND METHODS

Clinical study of skin conditions in newborn up to 3 days have been carried out to know the incidence of the skin conditions or lesion in newborns and analyse the effect of maternal factors, events during pregnancy, consanguinity, mode of delivery, maturity & birth weight of newborns and to compare the incidence of lesions with similar available Indian and foreign studies.

The present clinical study comprises of 1000 newborns from the Post-natal ward at Tertiary care hospital.

INCLUSION CRITERIA

1. All the newborn babies born in the hospital during the study period

EXCLUSION CRITERIA

1. Newborns in which Clinical examination of skin lesions is not possible due to some reasons
2. Newborns of parents who refused permission for examination

All the newborns satisfying inclusion and exclusion criteria were examined within 12 hours of the birth and then daily till discharged from the hospital for a maximum of 3 days. Relevant obstetrical history, history of any illness during pregnancy, history of drug ingestion, age of the mother, sibling history and parental consanguinity was noted. The various skin lesions were recorded. Their time of occurrence, the extent of involvement, anatomical location and time of disappearance were recorded. Birth weight of newborn, maturity of a newborn, mode of delivery, complications during delivery, detail of procedure performed with indication, condition of newborn at birth was noted. The result was tabulated and statistically analyzed.

RESULT

1.Obstetric data:

of the total 1000 newborn examined 524 were male and 476 were female. Of 1000 newborn 645 (64.5) were delivered by normal delivery & 355 (35.5) by cesarean section. 864 newborns were full term (37wk- 42wk of gestation), 119 newborns were preterm (<37wk of gestation) and 17 newborns were post-term (>42wk of gestation. (Table 1) Of the 1000 newborn 287 newborns had low birth weight (below 2.5 kg) & 713 newborns had birth weight >2.5kg.

Table- 1

Mode of deliveries	Term (n-854)		Preterm (n-119)		Post term (n-17)		Total
	No	%	No	%	No	%	
Normal	579	67.79	57	47.89	9	52.94	645
Caesarean section	285	32.20	62	52.11	8	47.06	355
Total	864		119		17		1000

2. Distribution of skin lesions: of a total of 1000 newborns 659 newborns showed evidence of skin lesions, 336 (50.98%) of them were male and 323 (49.02%) were females. There was not much difference in the incidence of skin lesions according to the sex of the newborn. Newborn with birth weight (< 2.5kg) showed a marginally lower frequency of skin lesions than a newborn with birth weight (>2.5kg). (62.36% vs 67.33%). (Table 2) The incidence of skin lesions in newborns according to the different age groups of mothers showed some difference. With group A (<20 yr of age) [69.06%] & group C (> 30 yr of age) [68.98%] showing higher incidence than of group B (21-30 yr of age) [64.58%]. (Table 3)The incidence of skin lesions according to a mode of delivery showed a significant difference, as those newborns delivered by a cesarean section showing an incidence of 78.87% as compared to 58.75% in those delivered by normal delivery. The reason behind this difference may be due to more follow up visit (at least 3 times) as these patients are there in hospital for at least 3 days after the cesarean section. Whereas newborn delivered by normal delivery used to be discharged on the second day of birth. So the incidence of skin lesions, especially transient condition is lower in the normal delivery group.

Table - 2

Distribution	<2.5 kg		>2.5 kg		Total
	No	%	No	%	
Newborn with skin lesion	179	62.36	480	67.33	659
Newborn without skin lesion	108	37.64	233	32.67	341
Total	287	100	713	100	1000

Table – 3

	<20 years group A (n - 139)		20-30 years group B (n - 703)		>30 years group C (n – 158)		Total
	No	%	No	%	No	%	

Newborn with lesion	96	69.06	454	64.58	109	68.98	659
Newborn without lesion	43	30.94	249	35.42	49	31.02	341
Total	139	100	703	100	158	100	1000

3. Incidence of various skin lesion (Table 4)

Mongolian spot- Mongolian spot was the most common skin lesion seen in 504 newborns with an incidence of 50.4 %. (Figure 1) Male showed an incidence of 47.32% and females showed an incidence of 53.78%. the finding was on the lower side compared to other Indian studies[4,5,6].

Figure 1: Mangolian Spot

Epstein pearl - Epstein pearl was the second most common skin lesion with an incidence of 41.1%. Males showed an incidence of 41.60% whereas females showed an incidence of 40.54 %. the findings were comparable to other studies [6,7].

Sebaceous hyperplasia (Figure 2) was seen in 171 (17.1%) newborns, with an incidence of 17.74% in male which was more than incidence in females 15.54%. Milia was seen in 113 (11.3%) newborns with an incidence of 10.30% in males and 12.39% in females. Erythema toxicum neonatorum (ETN) was seen in 69 (6.9%) newborns with an incidence of 6.67% in males and 7.14% in females. Incidence of Sebaceous hyperplasia, Milia and ETN were on the lower side as compared to other Indian [4,5,6] and foreign studies[7,9], which may be due to the longer duration of observation in those studies and transient nature of this condition.

Figure 2 – Sebaceous Hyperplasia

ETN is usually not present at birth. (Figure 3) It may start from birth to as late as 14 days of age but it begins usually within the second 24 hours of birth. That period is not covered in this study especially for newborn born after normal delivery, as they are discharged on the 2nd day after delivery.

Figure 3 : Erythema Toxicum Neonatorum

Physiological desquamation- Physiological desquamation was seen in 45(4.5%) newborns. (Figure 4) Male showed an incidence of 4.77% and females showed an incidence of 4.20%. It was not seen at birth and took few days developed. Physiological scaling usually peaks in the second part of 1st week and fades by the end of 2nd week as that period has not been covered in this study, the incidence is low.

Figure 4: Physiological Desquamation

Miliaria - Miliaria (Crystallina and Rubra) (Figure 5) was seen in 39 (3.9%) newborns. 3.62% of males showed lesions of miliaria whereas 4.2% of female showed incidence.

Figure 5: Milium with Miliaria Crystallina

Sucking callus- Sucking callus (Figure 6) was seen in 51(5.1%) newborns, males showing an incidence of 5.53% whereas females showing an incidence of 4.62%.

Figure 6 : Sucking callus or sucking Pads

Cutis marmorata - Cutis marmorata (Figure 7) was seen in16 (1.6%) newborns of them 4 (0.76%) were males and12 (2.52%) were females.

Figure 7 : Cutis Marmarota

Other transient skin conditions Transient neonatal pustulosis was seen in 2 (0.2%) newborns of which both were females. Neonatal acne was seen in 5 (0.5%) newborns of which 3 (0.57) were males and 2 (0.42) were females. Sclerema neonatorum was seen 2 (0.2%) in newborns both of them were females.

Other birth marks Salmon patch was seen in 7 (0.7%) newborns [6 males (1.14%), 1females (0.21%)]. Haemangioma was seen in 12 (1.2%) newborns [6 males (1.14%),6 females(1.26%)].Nevus achromicus was seen in 2 male newborns. Melanocytic nevus was seen in 5 (0.5%) newborns [1 males (0.19%),4 females (0.84%)].

Skin changes due to post maturity - It includes wrinkling of the skin due to subcutaneous fat loss due to post maturity giving rise to "old man like skin". It was seen in 6 newborns [4 males (0.76%), 2 females (0.42%)].

Infections - It was seen in 8 newborns. 5 (0.5%) of them had bacterial infection (impetigo) and 3 (0.3%) had fungal infection (oral candidiasis). low incidence of infection may be due to aseptic conditions in hospitals and short duration of observation.

A congenital malformation- It was seen in 4 newborns, one having a neural tube defect with skin tag at that site, one newborn had cleft lip with cleft palate. While the other two having accessory finger and syndactyly.

Other skin diseases- 1 newborn was having Epidermolysis bullosa simplex. One had Piabaldism. One newborn had features of Collodion baby. These findings may be chance findings.

Table - 4

Serial no	Lesions	Incidence					
		Male (n-524)		Female (n-476)		Total (n-1000)	
		No	%	No	%	No	%
Transient skin conditions							
1.	Milia	54	10.30	59	12.39	113	11.3

4.	Epstein pearl	218	41.60	193	40.54	411	41.1
5.	Sebaceous hyperplasia	93	17.74	78	15.54	171	17.1
6.	Erythema toxicum neonatorum	35	6.67	34	7.14	69	6.9
7.	Transient neonatal pustulosis	0	0	2	0.42	2	0.2
8.	Neonatal acne	3	0.57	2	0.42	5	0.5
9.	Sucking callus (sucking pads)	29	5.53	22	4.62	51	5.1
10.	Physiological desquamation	25	4.77	20	4.20	45	4.5
11.	Sclerema neonatorum	0	0	2	0.42	2	0.2
Skin changes related to postmaturity		4	0.76	2	0.42	6	0.6
Birth marks							
1.	Mangolian spot	248	47.32	256	53.78	504	50.4
2.	Salmon patch	6	1.14	1	0.21	7	0.7
3.	Haemangioma	6	1.14	6	1.26	12	1.2
4.	Nevus achromicus	2	0.38	0	0	2	0.2
5.	Melanocytic nevus	1	0.19	4	0.84	5	0.5
Congenital malformations		1	0.19	3	0.63	4	0.4
Infection							
1.	Bacterial infection	1	0.19	4	0.84	5	0.5
2.	Fungal infection	2	0.38	1	0.21	3	0.3
Congenital skin disease							
1.	Epidermolysis bullosa	0	0	1	0.21	1	0.1
2.	Piabaldism	1	0.19	0	0	1	0.1
3.	Colloidion baby	1	0.19	0	0	1	0.1

4. Correlation of maturity with skin lesions

Term newborns showed a marginally higher incidence of skin lesion as compared to preterm newborns (66.98% vs 63.02%). Similar findings were seen in another study [6]. Out of transient skin conditions, Epstein pearl (41.78%vs 37.81% & 29.41%) & sebaceous hyperplasia (17.70% vs 13.44% & 11.76%) showed marginally higher incidence in term newborns as compared to preterm and post-term newborn. Cutis marmorata (4.20% vs 1.28% & 0%) showed a higher incidence in preterm newborns as compared to term and post-term newborns. Skin changes due to post maturity were seen in 29.41% of post-term babies with one term baby 0.11% showing those changes. Fungal infection was more common in preterm newborns (preterm -2.52%vs 0% in both term and post-term newborns.). The difference in the incidence of birthmarks according to maturity was not significant. The rest of the skin conditions didn't show any significant difference.

5. Correlation of mode of delivery with a type of skin lesions

All transient conditions were more seen in newborn born after cesarean section. Example Milia (14.92% vs 9.32%), miliaria (7.88% vs 1.70%), sebaceous hyperplasia (22.25%vs 14.26%), Erythema toxicum neonatorum (13.52%vs 3.25%), Sucking callus (8.16% vs 3.14%), Physiological desquamation (7.04% vs 3.1%). This may be due to the longer duration of observation in newborn born after cesarean section. The rest of the lesion did not show any significant difference in incidence.

6. Correlation of consanguinity with a type of skin lesions

Frequency of skin lesion in newborn born after consanguineous marriage was 68.42 %, whereas it was 65.74% in newborn born after non-consanguineous marriages. The difference was not that significant. Mongolian spot showed a higher incidence in the case of newborns born after consanguineous marriage (61.40% vs 49.73%). Another study showed similar findings.[6] The rest of the lesions showed no difference in incidence.

7. Correlation of birth weight with a type of skin lesions

Cutis marmorata showed a higher incidence (5.22% vs. 0.14%) in a newborn with a birth weight of less than 2.5 kg. Epstein pearl showed marginally higher (42.63% vs. 37.28) incidence in the case of a newborn with a birth weight of more than 2.5 kg.

8.Correlation of events during pregnancy and skin lesions

The newborns of a mother having gestational diabetes mellitus showed a higher incidence of Milia (23% vs11.3%), Sebaceous hyperplasia (25.64% vs 17.1%), Epstein pearl (46.15% vs 41.1%). This may be due to other confounding factors. The newborns of a mother having pregnancy-induced hypertension showed higher (15.78% vs 6.9%) incidence of erythema toxicum neonatorum which may be a chance finding. The newborns of a mother who had taken drugs for various indications, for long durations (for example Anti Retroviral Therapy, antitubercular therapy, antihypertensive drugs in preeclampsia) during pregnancy showed no significant difference in incidence except erythema toxicum neonatorum (15.55%vs 6.9%). It can be a chance of finding

9. Comparison of data with available studies

Findings of data were compared with available studies. Two of them were foreign studies and the other three were Indian studies.

Mongolian spot was the most common lesion in our study with an intermediate incidence between Indian and foreign studies. A study by Rever et al which is from Australia showed an incidence of 25.5%, whereas the study by Tsai et al showed an incidence of 31.5 %, whereas Indian studies showed incidence ranging from 60.2% to 72%. Epstein pearl was seen in 41.1% of newborns in our study. Other studies showed incidence ranging from 43.8% to 88.7%. Other transient conditions (milia, erythema toxicum neonatorum, miliaria, sebaceous hyperplasia) were seen less commonly in our study as compared to other studies. This is due to the longer duration of the observation period in those studies, which increases the probability of finding a transient condition. Other birthmarks showed s`B comparable incidence except for the salmon patch which showed a low incidence in our study.

SUMMARY

The commonest manifestation observed was the Mongolian spot, followed by Epstein pearl, sebaceous hyperplasia, milia, erythema toxicum neonatorum, sucking callus, physiological desquamation, miliaria, cutis marmorata.

There was not much difference in the incidence of skin lesions according to the sex of the newborn. Newborn with birth weight (> 2.5kg) showed a marginally higher frequency of skin lesions than a newborn with birth weight (<2.5kg), especially Cutis marmorata showed higher incidence in a newborn with birth weight less than 2.5 kg. Frequency of skin lesion in newborn born after consanguineous marriage was marginally higher than newborn born after non-consanguineous marriages. The difference was not that significant. Mongolian spots especially showed a higher incidence in the case of newborns born after consanguineous marriage. Few transient skin conditions (Epstein pearl & sebaceous hyperplasia) showed marginally higher incidence in term newborns as compared to preterm and post-term newborns. Cutis marmorata, fungal infections showed a higher incidence in preterm newborns as compared to term newborns.

Newborns of a mother having gestational diabetes mellitus showed a higher incidence of Milia, Sebaceous hyperplasia, Epstein pearl. Newborn of, mother having preeclampsia & mother taking long term drug therapy during pregnancy showed a higher incidence of erythema toxicum neonatorum. These finding may be due to other confounding factors and needs larger studies.

Findings of data were compared with available studies and are presented in table 5 . The incidence of Mongolian spot and Epstein pearl were comparable. Other transient skin conditions were less common as compared to other studies; this may due to the longer duration of observation of newborns in those studies.

The study had some certain limitations. Newborns were examined maximum for 3 days after birth so the exact incidence of many transient conditions could not be found as these conditions may develop after that period. Certain transient condition example cutis marmorata may last for minutes only. Not every newborn was examined for three days as newborn born after normal delivery used to be discharged on the second day of birth. To know the exact incidence of skin conditions in newborn studies should be such that newborns can be examined frequently for a longer period which is only possible when a newborn is in the inpatient department. As the study didn't include newborn delivered outside the hospital the incidence may not represent true values.

The study, however, indicates the newborn skin conditions are quite common most of these are innocuous and require only reassurance to the parents, which may decrease the anxiety in them. It may help a lot to deter them from seeking the assistance of quacks & help to avoid

unnecessary and unjustified intervention & financial loss.

Many studies of this nature would help to throw light into many more aspects of neonatal dermatology and help a long way in an understanding of the subject and proper management of these kids.

Table 5

Lesions	1981 Nanda et al [4]	1990 River et al[7]	1993 Tsai et al [11]	2002 Sachdeva et al [5]	1998 Kulkarni et al[6]	Present study
Mangolian spot	62.2	25.5	31.3	60.2	72	50.4
Milia	34.9	36		23.2	26.2	11.3
Erythema toxicum	20.6	34.8	33.7	21	25.2	6.9
Epstein pearl	88.7	56		61	43.8	41.1
Miliaria				20.6		3.9
Sebaceous hyperplasia	31.8	48.4		24.4		17.1
Salmon patch	28.4		22.6	13.6	0.72	0.7
Haemangioma			0.7		0.1	1.2
Fungal infection						0.3
Bacterial infection						0.5
Sucking callus						5.1
Melanocytic nevus		2.1	0.4		0.5	0.5
Acne neonatorum				5.4		0.5
Cutis marmorata						1.6

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