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ORIGINAL RESEARCH

Clinico-epidemiological profile of dermatosis in neonates in a tertiary care hospital

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ABSTRACT

Aim: The present study aimed to assess the incidence and profile of neonatal dermatosis (ND) and its association with various perinatal risk factors in neonates presenting with skin lesions in atertiary care teaching hospital.**Materials and methods:** A cross-sectional observational study was conducted in the Department of Pediatrics, Base Hospital Delhi Cantt. over the duration of one year. After fulfilling the inclusion and exclusion criteria, 200 neonates were recruited for the study.Clinical performa including history, family history, anthropometry, detailed history of the symptoms and the dermatological examination of all the study subjects were carried out and data was recorded.Diagnosis of neonatal dermatosis was made by pediatrician after clinical examination and after dermatological consultation, whenever required.**Results:** The majority of neonates were born to mothers with age group 25-30 years (38.5%). Maximum patients were full term neonates 145 (72.5%).32.5% mothers of neonates were primiparous followed by parity one (32%).The 123 (61.5%) neonates were belong to birth weight group 2.6-3.5 kg. Majority of patients, 118 (59%) neonates were born by natural vaginal delivery. In 186 (93%) neonates history of consanguinity was not observed.The most prevalent Dermatosis in our study was Erythema Toxicum Neonatorum (24%) followed by Sebaceous Gland Hyperplasia (15%) and Mongolian Spots (10%).Sebaceous gland hyperplasia was significantly higher in post term neonates (26.70%)(p=0.04). Superficial desquamation was significantly higher in post term neonates (30%) (p=0.00).Erythema Toxicum Neonatorum (33.10%) and salmon patch (7.60%) was significantly higher in vaginally delivered neonates (p=0) (p=0.041) respectively. Mongolian Spots andSuperficialDesquamationwas significantly higher in neonates born with c section (p=0.021)(p=0.001) respectively. Milia was significantly higher in neonates having birth weight less than 1.5kg (40%) (p=0.01). Capillary hemangioma was significantly higher in neonates having birth weight more than 3.5kg (16.70%). (p=0.05).**Conclusion:** The study identified Erythema toxicum neonatorum, sebaceous gland hyperplasia and Mongolian Spots as prevalent cutaneous lesion. Parenteral Anxiety associated can be alleviated by accurately diagnosing these physiological and pathological conditions in neonates and counseling the parents; this prevents the need for unnecessary diagnostic testing and treatment.

Keywords: Dermatosis, Neonates, Incidence,Risk factors

INTRODUCTION

The first 28 days of extrauterine life are considered to be the neonatal period. The first seven days of life are often referred to as the early neonatal period.[1]This period is highly influenced by the newborn's adaptation to life outside the uterus and physiological changes brought on by the transition from the liquid uterine milieu to the dry outside environment.[2]

The skin is a complex and dynamic organ that carries various vital functions.Skin begins to mature during embryogenesis as a result of intracellular and intercellular signals between various tissue layers.An infant's skin is different from an adult in that it is thinner, more fragile, has weaker intercellular bonds and secretes less perspiration and sebaceous gland secretions. Hence, it is more vulnerable to serious infections.[3]Its cutaneous constitution is different from that of adult skin due to the immaturity of its glandular and melanocytic cells, the thickness of its thin layer, and its biochemical makeup, which raises the pH.[2]

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Neonatal skin is susceptible to neonatal dermatosis (ND) due to anatomical and physiological reasons. On most of the occasions, intervention is not necessary because most lesions are physiologically benign and self-limiting. Approximately 99.3% of newborns have different skin symptoms.[4] Only a small percentage of these are pathological; the majority are temporary and natural, disappearing without therapy.[5]Hereditary, race/ethnicity, gestational age, and maternal health are variables which influence skin change, in addition to other environmental factors including cleanliness, socioeconomic status, customs, delivery method, etc.[6]In a Pakistani research, the prevalence of ND was 34.7%[7], but in Australia, it was 99.3%.[8] India had the highest Intermediate values (55.0%) followed by Turkey (67.3%). The Iranian (96%) and Indian (93.3%) populations had the figures that were closest to the prevalence.Methodological and ethnic-social differences, such as sample size, duration of the newborn period during the examination, inclusion of problematic dermatosis, inclusion of mucosas/faneros and ethnic plurality, may result in differences between ND data in various populations.[2] ND may develop asa result of the early cutaneous attachment of neonatal period, which are still developing at birth,gradually going through a maturation process. Therefore, the skin contributes to the process of adjustment to life outside the womb.Impaired function during the formation of the skin barrier leaves the skin vulnerable to chemicals, microbial infections and skin illnesses, potentially jeopardizing the newborn's overall health.Early detection of pathological newborn dermatosis aids in the initiation of early targeted therapy because a few lesions may be the cutaneous expression of a potentially fatal systemic disease.[9]Therefore, it's critical to identify these dermatosis in order to properly assess each case and determine the best course of action.

So, we proposed a study to assess the incidence and profile of neonatal dermatosis and its association with various perinatal risk factors in a neonatal ward of a tertiary care teaching hospital.

MATERIALS AND METHODS

After obtaining clearance from the ethical committee, this Cross-sectional observational study was conducted in the Department of Pediatrics, Base Hospital Delhi Cantt.over the duration of one year.

All inborn newborns or outborn neonates upto the age of 28 days attending our department for dermatological problems were recruited for the study.Written informed consent was taken from all parents. The study procedure was explained to the parents before consenting.

- Clinical performa including history, family history, anthropometry, detailedhistory of the symptoms and the dermatological examination of allthe study subjects were carried out and data was recorded. To reach a diagnosisdermatology consultation and relevant investigations were carried out. Patientswere followed up till clearance of lesions/up to 1 month to see the course of thedisease.
- Seasonal variations in incidence and also its effect on the presentation was studied.Effect of nutrition on the disorders was also studied. Appropriate statistical methodswere studied to analyze the data.

Inclusion Criteria

- Age group: Birth to 28 days of life.
- All neonates inborn or outpatient attending / referred to our department fordermatological problems.

Exclusion criteria

- Neonates with maternal history of drug/alcohol abuse.
- Neonates with gross congenital malformations.
- Critically ill neonates.
- Neonates with jaundice cyanosis and pallor.

Sample size

The sample size was calculated using following formulae

N = (Zα/2) 2 * (PQ) / E2

N = Sample size

Zα/2 = Z value at 1% error (2.58)

P = Taken as 93.5% (In a recent study from Karnal, Marwah et al found that neonatal dermatosis were diagnosed in 94.1%)[4].

Q = 1-P

E = Allowable error (taken as 5%)

N = (2.58)2 * (0.941*0.059

(0.05)2

N = 147.8 (minimum sample size)

During the study period, we included 200 consecutive neonates eligible to participate in this study.

Data Collection Techniques and Tools

The data was collected on a pre-designed study performa.

- Maternal history included: maternal age, parity, mode of delivery, history ofconsanguinity and any illness during pregnancy.
- Examination of baby: general, systemic and dermatological examination of skin, scalp,mucous membranes, genitalia, hair and nails was done after proper hand hygiene underadequate light and ambient temperature.
- Also noted would be birth weight, maturity status, gender of neonate and anthropometry.
- Diagnosis of neonatal dermatoses was made by pediatrician after clinical examinationand after dermatological consultation, whenever required. When necessary, Gram’sstains, potassium hydroxide mount, bacterial culture, maternal blood venereal diseaseresearch laboratory, and skin biopsy were done. Photographic records were maintained.

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STATISTICAL ANALYSIS

The collected data was numerically coded and entered in Microsoft excel 2007 and then transferred to Windows Statistical Package of Social Sciences (SPSS) software (version 21). Quantitative data was described as means and standard deviations and qualitative data were described as median and interquartile range. The relationships between the occurrence of the lesions with the various maternal and neonatal factors were analyzed using statistical tests. Independent t test was used for comparing means and chi-square test was used for comparing percentages. A two-sided p-value less than 0.05 was considered statistically significant.

RESULTS

The majority of neonates were born to mothers with age group 25-30 years (38.5%) followed by 21-25 years (36%), 31-35 years (15.5%) and ≤ 20 years (10%).Maximum patients were full term neonates 145 (72.5%) followed by post term 30 (15%) and preterm 25 (12.5%).32.5% mothers of neonates were primiparous followed by parity one (32%), P2 (29.5%) and >3 (6.0%).The 123 (61.5%) neonates were belong to birth weight group 2.6-3.5 kg. Majority of patients 118 (59%) neonates were born by natural vaginal delivery.In 186 (93%) neonates history of consanguinity was not observed. (Table 1)

The most prevalent Dermatosis was Erythema Toxicum Neonatorum 24% followed by Sebaceous Gland Hyperplasia 15%, Mongolian Spots 10%, Neonatal Acne 8.5%, Superficial Desquamation 7.5%, Milia 6.5%, Salmon Patch 5% and Diaper Rash 5%. (Table 2)

Sebaceous gland hyperplasia was significantly higher in post term neonates (26.70%) as compared to full term neonates (11%) and pre term neonates (24%) (p=0.04). Superficial desquamation was significantly higher in post term neonates (30%) than full term (4.10%) (p=0.00). No other Dermatosis showed statistically significant association. (Figure 1)

Erythema Toxicum Neonatorum was significantly higher in vaginally delivered neonates (33.10%) as compare to neonates born with caesarian section (11.0%) (p=0). Mongolian Spots was significantly higher in neonates born with c section (15.90%) than vaginal delivered neonates (5.90%) (p=0.021).Superficial Desquamation was significantly higher in neonates born with caesarian section (14.60%) (p=0.001) and Salmon Patch was significantly higher in vaginally delivered neonates (7.60%) (p=0.041) while the association of other Dermatosis was not significant. (Figure 2)

Milia was significantly higher in neonates having birth weight less than 1.5kg (40%) as compare to other birth weight groups 1.5-2.5 (9.10%) and 2.6-3.5 (4.10%) (p=0.01). Capillary hemangioma was significantly higher in neonates having birth weight more than 3.5kg (16.70%) than other groups (p=0.05). No other Dermatosis showed significant association. (Figure 3)

Table 1: Distribution of patients as per Age of mother, Gestation, Parity, Birth weight, Mode of delivery and Consanguinity

		Frequency	Percent
Age of mother (years)	≤20	20	10.0
	21-25	72	36.0
	25-30	77	38.5
	31-35	31	15.5
Gestation	Preterm	25	12.5
	Post-term	30	15
	term	145	72.5
Parity	>3	12	6.0
	P1	64	32.0
	P2	59	29.5
	Primigravida	65	32.5
Birth weight	<1.5	5	2.5
	1.5-2.5	66	33.0
	2.6-3.5	123	61.5
	>3.5	6	3.0
Mode of delivery	CS	82	41.0
	NVD	118	59.0
Consanguinity	Consanguinity	14	7.0
	Non Consanguinity	186	93.0

Table 2: Distribution of neonates according to Dermatosis

	Frequency	Percent
Erythema Toxicum Neonatorum	48	24.0
Sebaceous Gland Hyperplasia	30	15.0

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Mongolian Spots	20	10.0
Neonatal Acne	17	8.5
Superficial Desquamation	15	7.5
Milia	13	6.5
Salmon Patch	10	5.0
Diaper Rash	10	5.0
Seborrheic Dermatitis	8	4.0
Neonatal PustularMelanosis	6	3.0
Capillary Hemangioma	5	2.5
Flexural Eczema	4	2.0
Café Au-lait Macules	4	2.0
Axillary Pigmentation	3	1.5
Aplasia Cutis Congenital	3	1.5
Congenital Melanocytic Nevi	2	1.0
Atopic Dermatitis	2	1.0
Total	200	100.0

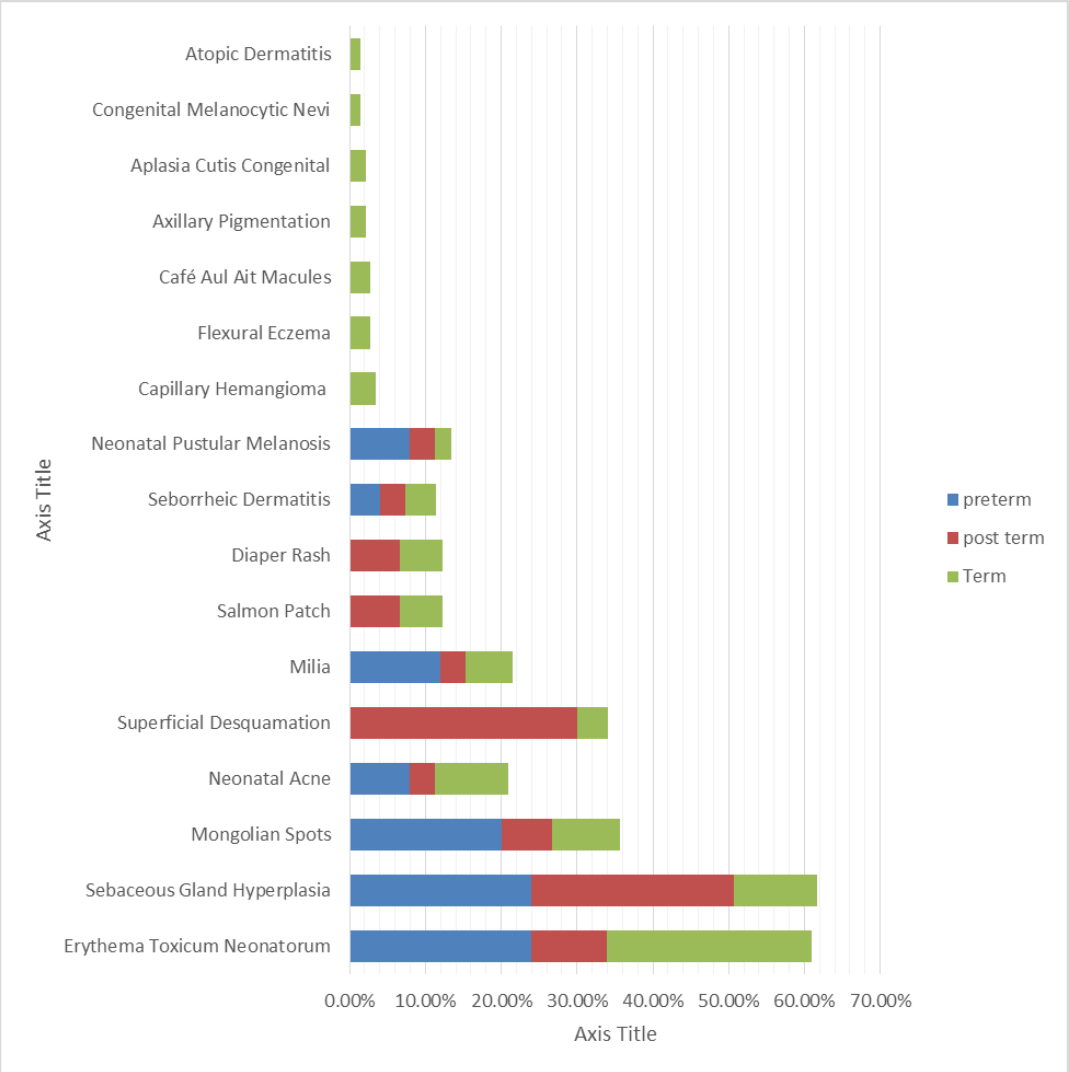

Figure 1: Association of dermatosis with gestation

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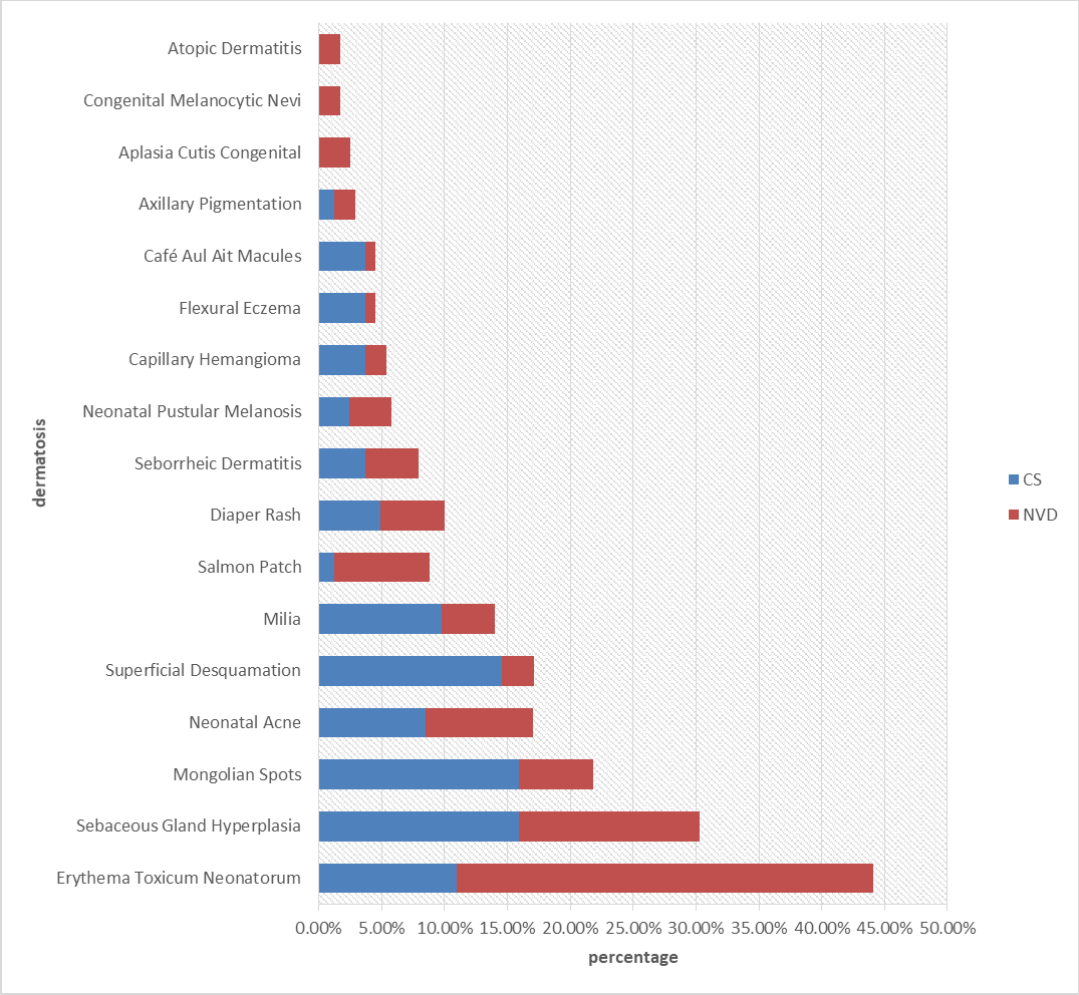

Figure 2: Association of Dermatosis with mode of delivery

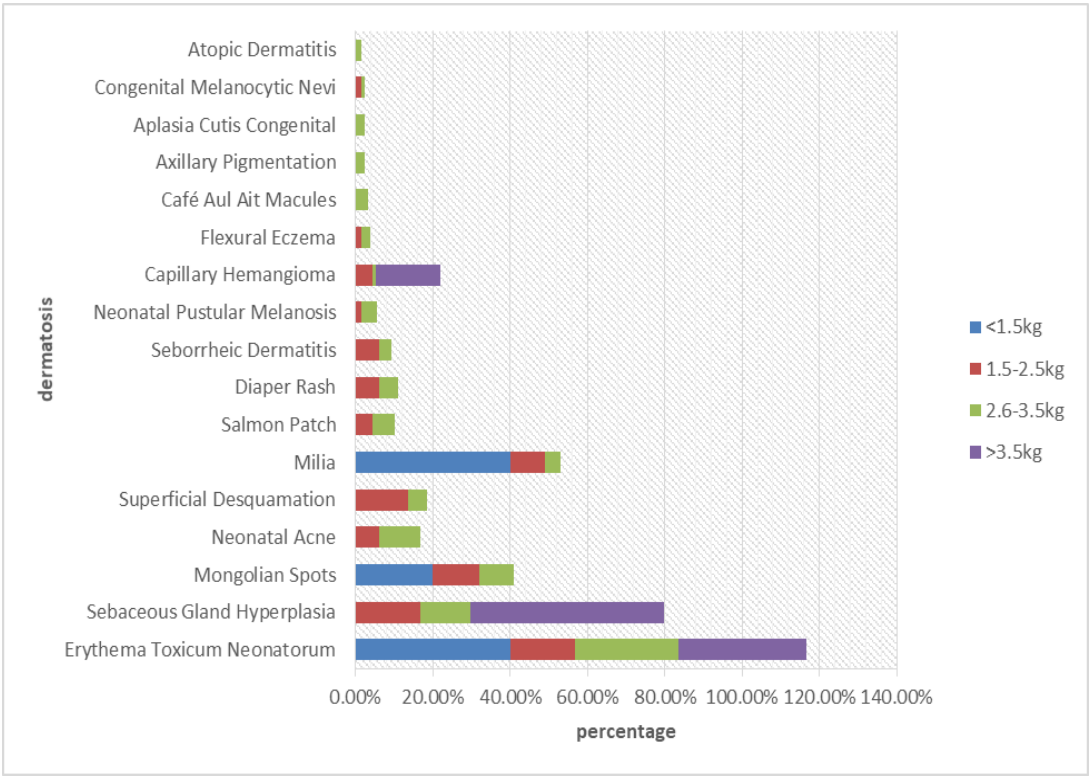

Figure 3: Association of Dermatosis with birth weight of neonates

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DISCUSSION

The medical literature is consistent with the high prevalence of ND and its concurrent and multiple forms of development. It is crucial to distinguish the spectrum of neonatal dermatosis from the more serious cutaneous disorders that affect infants.Certain neonates exhibited transient skin lesions that were concurrent with other contagious illnesses. A thorough examination and the opinion of a dermatological expert will aid in differentiation.[10]

In the present study 38.5% of neonates were born to mother's age ranged between 25-30 years.The results of our study were in accordance with Marwah P et al[4] and NaharS et al[10].Maximum patients were full term neonates 145 (72.5%). A study conducted by Chandrakala C et al[11] and Dash K et al[12] observed the similar results in their study. 32.5% mothers of neonates were primiparous.The birth weight of 61.5% of neonates ranged between 2.6-3.5 kg.ShahS et al[13], Patel PV et al[14] and Marwah P et al[4] showed the same results in their study.

In our study, out of total 200 neonates, 118 (59%) neonates were born by natural vaginal delivery and 82 (41%) neonates were born by caesarian section. The results of our study were similar to the results of Chandrakala C et al[11] and Kruger EMM et al.[2] The delivery method influence the frequency of ND. With regard to the delivery method, there was a higher prevalence of neonatal dermatoses in vaginal and cesarean birth infants, respectively.[2]various researches indicated that babies born via vaginal delivery may have a higher prevalence of conditions like erythema toxicum neonatorum (ETN), while those born by cesarean section might show more physiological desquamation.[15]

In 186 (93%) neonates history of consanguinity was not observed while it is present in 14 (7%) neonates. Our results were in accordance with Marwah P et al[4] and Gorur DK et al.[1]Research indicates a significant association between consanguinity and an increased risk of neonatal dermatoses, particularly those with a genetic basis, as consanguinity increases the likelihood of inheriting recessive genetic mutations that can manifest as skin conditions in newborns.[16]

The most prevalent Dermatoses in present study was Erythema Toxicum Neonatorum 24%.The study done by Agarwal G et al[9] showed similar results 22% Erythema Toxicum Neonatorum cases.Our results were also comparable with Gorur DK et al[1] (19%), Marwah P et al[4](41%).Numerous studies were held on neonatal Dermatoses. Different Dermatoses were predominated in different studies.

Yellow-white papulo-vesicular lesions known as Erythema toxicum neonatorum predominantly manifest on the trunk, limbs, and legs. Every lesion is enclosed by a region of redness, which imparts the appearance of being bitten by fleas.ETN was observed in 24% of neonates in our study.It is frequently observed in male neonates (41%) born to mothers having age more than 30 years (32.30%). Erythema toxicum neonatorum was significantly higher in multiparous mother (35.20%). A study conducted by Gorur DK et al[1] (19%), SachdevaM et al[17] (21%)showed the high incidence of ETN. 33.19% of ETN observed in neonates which were born by natural vaginal delivery. This association was statistically significant (p=0.0).

Sebaceous gland hyperplasia is uncommon in premature infants. Sebaceous follicle openings exhibit numerous, minuscule, yellowish papules.Itwasobserved in 15% of neonates which were born to mother's age ranged between 26-30 years (16.90%) and also showed significant association with consanguinity (35.7%).A study conducted by Adegbidi H et al[18] (12%) showed almost similar results as compare to our study.

Mongolian spots are bluish-black, flat macules that result from the cessation of melanocytic migration in the embryonic dermis.20 neonates (10%) neonates were having Mongolian spots. It was observed in female neonates (13%) who were born to mothers having age ranges between 21-25 years (12.50%). Mongolion spots was significantly higher in multiparous mothers (16.90%). Our results were in accordance with the results of Kruger EMM et al[2] (9.1%).

Sebum secretion is high in neonates due to sebaceous gland activity reflects the stimulation by placentally transferred maternal androgen, particularly by dehydroepiandrosterone.[19] In our study 17 neonates (8.50%) neonates were having neonatal acne.Almost similar results were observed by NaharS et al[10] (12%).Chandrakala C et al[11] (1.81%) and Marwah P et al[4](0.6%) showed lesser incidence of neonatal acne.

In present study desquamation was found in 7.50% neonates. It is observed in female neonates (10%) born to mothers having age ranged between 26-30 years (10.40%).desquamation was also seen in post term babies (30%) born by caesarian section (14.60%).

Milia are superficial epidermal inclusion cysts. Mostly found in forehead, cheeks and nose as whitish papules.6.50% neonates were having milia.Itwas significantly higher in neonates having birth weight less than 1.5kg (40%). Our results were in accordance with NaharSetal[10](8.6%).

Selmon patch was observed in 5% of neonates.The association with gender was statistically significant. Salmon Patch was significantly higher in primiparous (10.80%). Agarwal G et al[9], Zagne V et al[20] and Patel PV et al[14] showed higher incidence of salmon patch in their studies.It was mainly observed in post term babies (6.70%) born by natural vaginal delivery (7.60%) in our study.

Diaper dermatitis is a broad term used to describe rashes that occur in the diaper area due to a secondary bacterial or fungal infection. In the present study, 5.0% neonates were having diaper rashes.Seborrheic Dermatitis was observed in 8 neonates (4%).Neonatal PustularMelanosis manifests as superficial, flaccid

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pustules that are prone to rupture, eventually transforming into hyperpigmented macules with a residual appearance.In the present study 3% neonates were having neonatal pustularmelanosis.Variations in results were observed in the studies done bySandeep B et al[21] (6.8%) and Adegbidi H et al[18] (1.86%).

Hemangiomas were observed in 5cases (2.50%).It wassignificantly higher in neonates having birth weight more than 3.5kg (16.70%) than other groups. (p=0.05).These observations are consistent with Osburn K et al[22]and Amir J et al.[23]

2% of neonates were having café au laitmacules.Aplasia cutis congentiaisseen in 1.50% of neonates.Flexural Eczema was observed on 2% of neonates.Axillary Pigmentation (1.50%), Congenital Melanocytic Nevi (1%) and Atopic Dermatitis (1%) were having very low incidence in our study.

CONCLUSION

The study identified Erythema toxicum neonatorum, sebaceous gland hyperplasia and Mongolion Spots as prevalent cutaneous characteristics. Anxiety can be alleviated by accurately diagnosing these physiological and pathological conditions in neonates and counseling the parents; this prevents the need for unnecessary diagnostic testing and treatment.

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