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Case report

Congenital miliaria crystallina – A diagnostic dilemma

Sudhir Dixit^a, Ashish Jain^{b,*}, Suhas Datar^c, V.K. Khurana^d^a Senior Resident, Neonatology Division, Department of Pediatrics, Hindu Rao Hospital, Malka Gunj, Delhi, India^b Neonatologist, Neonatology Division, Department of Pediatrics, Hindu Rao Hospital, Malka Gunj, Delhi, India^c Senior Specialist, Neonatology Division, Department of Pediatrics, Hindu Rao Hospital, Malka Gunj, Delhi, India^d Dermatologist, Department of Skin, Hindu Rao Hospital, Malka Gunj, Delhi, India

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ABSTRACT

Miliaria crystallina is a transient, superficial obstruction of eccrine sweat ducts resulting in rapidly evolving noninflammatory vesicles. The disease is observed frequently in hot, humid, tropical climates and in the neonatal period, most likely due to lack of maturation of the sweat duct during the first few days following birth. It is rarely present at delivery and remains a diagnostic dilemma for the neonatologists. We report a rare case of “Congenital miliaria crystallina” that was present at birth.

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Introduction

Vesicular and pustular disturbances of the neonatal period are not uncommon. Most of them are harmless; however it is important to differentiate these from potentially life-threatening infectious and non-infectious disorders.¹ Miliaria crystallina is commonly considered in the differential diagnosis of bullous diseases in newborns. Studies report an incidence of 1.3% in neonates developing skin lesions within 48 h of life.² This is a transient, superficial obstruction of eccrine sweat ducts resulting in rapidly evolving noninflammatory vesicles. The disease is observed frequently among neonates in hot, humid and tropical climate. Mostly there is lack of maturation of the sweat duct during the first few days following birth, but is rarely present at delivery.³ We report a rare case of “Congenital miliaria crystallina” presenting at birth.

Case report

A female term baby, appropriate for gestational age with birth weight of 2.65 kg was born to a primi gravida, 28-year-old mother. She was an outcome of normal vaginal delivery. The apgar scores were 8, 9, 9 at 1, 5 and 10 min respectively. General physical and systemic examination was within normal limits, except that the skin was covered with vesicular lesions of variable size and distribution, containing clear fluid.

There was no associated erythema (Fig. 1).

Antenatally, mother was a booked case and had not taken any medicine. However mother had fever starting 3 days prior to onset of labour. On investigation her TLC was 12,000 and CRP was positive. LFT, KFT was within normal limits and blood culture was sterile. The mother was treated with antibiotics and antipyretics. In spite of the above treatment, the mother's temperature in labour room was 101 °F. At birth

* Corresponding author. Tel.: +91 9810694789.

E-mail address: drashishjain2000@yahoo.co.in (A. Jain).

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Fig. 1 – Baby with Miliaria crystallina at birth.

baby's skin was covered with tiny, closely spaced vesicles spread over face, neck, upper arm and trunk. Vesicles were clear, 1–3 mm in diameter with silvery to shining surface. Tzanck test did not show any acantholytic cells or neutrophils and gram stain found no bacteria. CBC, CRP and blood culture was negative. TORCH screen was negative.

On the basis of typical cutaneous lesions, diagnosis of miliaria crystallina was made in consultation with the dermatologist. Baby was moved to a cooler environment. Over next 2 days no new vesicles erupted. On 4th day vesicles dried and by 7th day skin was normal in appearance.

Discussion

Miliaria results from retention of sweat in occluded eccrine ducts as a result of keratinous plugs. Retrograde pressure results in rupture of duct and leakage of sweat in to the epidermis and/or dermis. Miliaria occurs in 3 forms; miliaria crystallina, rubra, and profunda. This classification is based on the level of blockage of eccrine sweat duct.⁴ In miliaria crystallina (sudamina), the obstruction of the eccrine duct is very superficial i.e. within the stratum corneum and commonly occurs with febrile diseases or after sunburn, most often in hot and humid climatic conditions. Children are particularly at risk.

Clinically translucent, thin roofed vesicles of 1–2 mm diameter without an inflammatory halo are observed. If opened with a needle, a clear, watery liquid is obtained. Lesions develop preferentially on the neck and axillae. In the neonatal period, the face can be involved as well. This was the case in our infant, too. Vesicles in this location can have a silvery sheen. This is not based on leukocyte influx as in miliaria rubra, but caused by corneocytes in the blister, and is known as a variant called miliaria crystallina alba. The thin roofs covering the blisters rupture easily and the skin clears thereafter, leaving a superficial, branny desquamation.⁵

The differential diagnosis of neonatal blistering includes several infectious and bullous dermatoses. Herpes simplex

and varicella show serous vesicles. Erythema toxicum neonatorum, neonatal pustular melanosis, and acropustulosis of the child show pustules. Staphylococcal infection causes staphylococcal scalded syndrome or large blisters which differ clearly from minute vesicles in miliaria. The most important difference remains that, in miliaria crystallina, the sweat in the blisters is not yellowish, but clear like water. Therefore, the colour and the form of the blisters allow a definite clinical diagnosis.

Therapy of miliaria crystallina is simple. The only effective treatment and prevention is to avoid further sweating. A few hours in a cool environment will bring relief. Other prevention and treatment modalities include avoidance of excessive clothing, friction from clothing and excessive use of soap. Topical antibacterial preparations have some role in preventing the commonly occurring secondary infections in miliaria. Calamine lotion followed by a bland emollient is also beneficial.

In newborns and children, the disease is rather frequent. Thus, in a retrospective study from Japan, including 5387 infants in a newborn ward, miliaria crystallina was seen in 4.5%, with a peak occurrence around the 6th and 7th post-natal day. In this large series, the occurrence was classified as extremely rare before day 4.⁶ In an Indian study over a period of 7 months, 131 neonates were found to have miliaria crystallina within 48 h of birth.⁷ Most of the articles are of the opinion that the disease does not occur at delivery.⁸ It is suggested that duct disruption is the immediate cause of miliaria.⁹ The hydration of corneocytes varies with the degree of environmental humidity and temperature. In our patient, the maternal fever might have been the trigger.

There are only 3 reports so far in the literature on congenital miliaria crystallina, two in black newborns^{10,11} and only one in white newborn as in our case.³ The same has not been reported in Indian literature. According to Straka et al,¹⁰ who described the first case, the disease most probably derives from immature sweat ducts within the first weeks of life. Probably the occlusion of the sweat ducts had formed already in utero as in our case.

Conflicts of interest

All authors have none to declare.

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Patient safety has become an important strategic focus for all health-care organizations. Most patient safety research has focused on analysis of systems and processes that lead to adverse events. However, little research has examined how patients think of safety or how their perceptions might influence outcomes of care. Studies have revealed that patient perceptions of poor co-ordination of care, poor interpersonal skills and unprofessional behavior are often associated with adverse events and thus, patients experiencing service quality lapses are not only frustrated ‘Consumers’, but actually fearful of their safety. The present study was conceived to examine perceptions of patient safety among acute care patients and their relation with service quality and satisfaction. This study hypothesizes that patient safety mediates the relationship between service quality and satisfaction.

The most prevalent theoretical approach to explain patient satisfaction has been based on expectation models, that propose that patients compare their health-care experiences with what they expect. Satisfaction arises when high expectations are confirmed or low expectations are not confirmed. The present study model suggests that poor service quality may actually lead to serious negative perceptions about patient safety.

The study was carried out by using a questionnaire survey, pretested for its content validity and internal consistency on a sample of 496 patients (response rate of 35%), randomly selected from three hospitals of a particular US health system. Only adult patients (age >18 years) with a medical or surgical visit in the previous 90 days were made eligible for sampling,

whereas patients for psychiatric or maternity visit were excluded. The questionnaires have been developed around the constructs of patient satisfaction, service quality and patient safety. The data collected by the survey was subjected to statistical analysis, using multiple regression with forward selection and patient safety perceptions were found to have fully mediated the relationship between service quality and patient satisfaction ($R^2 = 0.51$, $F = 148.66$, $P < .001$).

The key findings of the study were support for the hypothesis that service quality influences patient judgments about their safety in the hospital and such safety perceptions mediate the relations between service quality and patient satisfaction, which may also have an impact on correlates of satisfaction, such as clinical outcome. The study result implies that improvement efforts that result in patients feeling safer can have significant influence on the satisfaction quotient of a hospital and all health-care organizations may need to focus on service attributes that lead to patient safety perceptions, in addition to technical quality.

The study had certain limitations of the study design being cross-sectional, thus precluding any causal inferences. A longitudinal study design to examine the mediating role of safety perceptions, when separated in time from service quality measures will add further value to the increasing patient safety literature.

Contributed by:
Brig Abhijit Chakravarty
Professor & HOD, Department of Hosp Adm,
AFMC, Pune 40, India

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