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Case Report

Crystalline Miliaria: Its Relevance in Intensive Care Units in the Context of Two Cases

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Abstract: This condition, characterized by the obstruction of the sweat gland, results in the retention of its hypotonic content beneath the skin. This phenomenon can occur at any age; however, it is more prevalent in neonates due to the functional immaturity of the eccrine glands. These glands contain muscarinic and adrenergic receptors, and in the intensive care unit, there is a high prevalence of patients receiving adrenergic drugs that can modify the function of these receptors and induce its onset. It is imperative to note that the key element in this analysis is...The following terms are used to describe cutaneous lesions: eccrine sweat glands, bullous lesions, bullae, vesicles, and miliaria crystallina.

Keywords: Miliaria crystallina, Eccrine glands, Neonates, Vesicles, Sweat gland obstruction.

INTRODUCTION

This dermatosis is characterized by the accumulation of eccrine gland secretions within the stratum corneum, precipitated by environmental factors such as heat and humidity [1].

It is well-documented that elevated temperatures and humidity are significant contributing factors to the development of this condition, particularly in tropical regions [2]. A multitude of factors have been identified as contributing to the development of Miliaria Cristalina [3]. These include, but are not limited to, febrile episodes, hypernatremia, and neutropenia. Its prevalence is higher in neonates, affecting 5-9% of neonates in the first 2 weeks of life, although it is not exclusive to children and adults can also be affected [4].

It has been demonstrated that moisture has the capacity to modify the keratinization process, resulting in a non-inflammatory obstruction of the eccrine gland duct in the subcorneal or intracorneal stratum. The prevalence of vesiculation in covered areas is attributable to the confluence of factors, including but not limited to elevated temperatures and humidity. The presence of eccrine glands within the skin is a contributing element, albeit not a determining one [1-4].

This occlusion gives rise to multiple fragile, pearly vesicles measuring between 1 and 2 millimeters in diameter, characterized by clear content and the absence of an inflammatory halo. In some cases, these vesicle formations are accompanied by pruritus [5]. The distribution of these lesions varies across different body sites; in the neonatal period, they predominantly manifest on the scalp, forehead, and upper trunk. However, there are documented cases of lesions developing in distant sites, including the neck, skin folds, and even the face [6].

Typically, a diagnosis can be determined based on the clinical findings, which include the appearance and association of the lesions, despite the presence of intraepidermal vesicles accompanied by parakeratotic hyperkeratosis as indicated by histological examination. Additionally, the presence of leukocytes obstructing the superficial glandular pore has been observed [1]. The histopathology of MC is typified by the presence of an intracorneal or subcorneal vesicle that emerges from the acrosyringium of the sweat duct. These vesicles have been observed to contain neutrophils [6].

An accurate diagnosis can be made based on the following elements: the characteristics of the lesions, their location, and the presence of precipitating factors. It is imperative to exclude other vesicular and maculopapular conditions, including but not limited to: viral infections caused by varicella-zoster virus and herpes simplex virus, congenital candidiasis, erythema toxicum neonatorum, bullous impetigo, transient neonatal pustular melanosis, infantile acropustulosis, incontinentia pigmenti, and epidermolysis bullosa [1-6].

CASE PRESENTATION

Case 1: A 79-year-old female patient with a medical history of type 2 diabetes and hypertension was on her 20th day of hospitalization with a diagnosis of soft tissue sepsis secondary to a submental abscess and ventilation-associated pneumonia. The patient exhibited the following symptoms: Upon thorough examination, the patient exhibited perfusional blood pressure, a consequence of amine utilization. The patient also manifested clinical dermatosis (Figure 1), characterized by the presence of multiple confluent translucent vesicles containing clear fluid on the skin, accompanied by xerosis. This dermatosis was localized to the anterior and posterior thorax and abdomen. No Nikolsky's sign was observed.

Figure 1: Miliaria crystallina

Case 2: A 72-year-old female patient with a medical history marked by hypertension was on day 26 of her hospital stay. Her current diagnosis included ventilator-associated pneumonia, persistent atrial fibrillation, sequelae of a previous stroke, and acute kidney injury.

Upon thorough examination, the patient exhibited perfusional blood pressure, a consequence of the utilization of amines. Additionally, the patient displayed dermatosis, a term denoting cutaneous manifestations, which was localized to the anterior and posterior chest and abdomen. (Figure 2). This dermatosis was characterized by the presence of numerous translucent, confluent vescles containing clear fluid on the epidermis. These lesions were accompanied by the presence of xerosis, a condition marked by excessive desiccation of the skin.

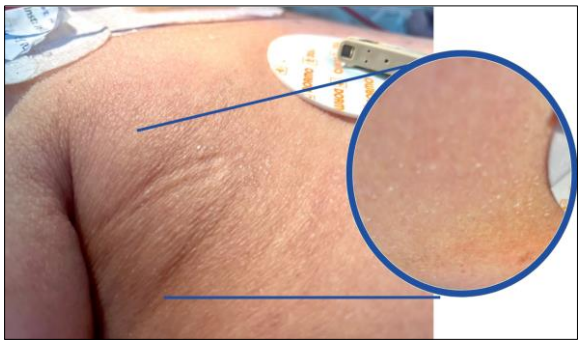

Figure 2: Miliaria crystallina

DISCUSSION

Crystalline miliaria is an uncommon occurrence in adult patients; however, in this particular case, it has been associated with the autonomic nervous system (ANS), through its primary neurotransmitters, acetylcholine (ACh) and

norepinephrine (NE). These neurotransmitters primarily stimulate muscarinic M3 receptors and adrenergic receptors (a1, a2, and a3).

Acetylcholine (ACh) and norepinephrine (NE) primarily stimulate muscarinic M3 receptors and adrenergic receptors (A1, A2, and A3) in the eccrine glands, thereby inducing sweat production and reducing body temperature [7-9].

In intensive care therapies, critically ill patients require multiple medications that influence ANS signaling, including epinephrine, dopamine, norepinephrine, dobutamine, cisatracurium, isoproterenol, and phentolamine. These medications are used to maintain vital functions such as blood pressure, heart rate, and levels of consciousness. Furthermore, patients frequently require mechanical ventilation, necessitating the maintenance of a covered body to prevent ventilation. Consequently, critically ill patients are susceptible to developing crystalline miliaria [5].

The patients previously mentioned were receiving intermediate care and were both administered norepinephrine to maintain blood pressure. The images are deliberately presented with the devices attached to the skin, as these are regarded as associated factors. Furthermore, these events transpired in May, a period marked by elevated ambient temperatures. Consequently, both cases underscore the significance of thorough patient examination, identification of risk factors, and precise dermatological characterization.

The differential diagnosis for such cases may include a range of potential etiologies, such as allergic reactions, viral rashes, vasculitis, and herpes infections.

Once the triggering factors have been addressed, the lesions typically resolve without scarring. Therefore, it is essential to maintain a cool environment and ensure adequate ventilation of the affected areas [2-10].

CONCLUSION

Crystalline miliaria is a relatively common condition in pediatric patients. However, in the context of crystalline miliaria in intensive care units where temperature and humidity are kept at a constant level, it is suggested that additional factors, such as nerve stimulation of the glands, contribute to increased sweating and occlusion. This process is modified by several frequently used drugs.

The clinical diagnosis is characterized by manifestations in covered areas (e.g., clothing, plastics), accompanied in some cases by fever. The etiology of these manifestations may involve drugs, including salbutamol, neostigmine, and erythropoietin, which have been demonstrated to induce obstruction of the acrosyrinx. Accurate identification of this condition is crucial as it facilitates effective preventative measures. Once this condition manifests, it is imperative to ascertain that it is benign and non-infectious. Subsequently, measures must be implemented to address the condition.

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