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DERMA TODAY

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Dear Doctor,

Greetings from Micro Labs. We are happy to bring you "Derma Today" which contains latest and interesting news in the field of Dermatology.

This issue contains:

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Looking forward to your valuable feedback.

Best Regards,

Medical Team, Micro Labs Limited.

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A Comparison of Cutaneous Fungi in Atopic Dermatitis Patients and Healthy People

Introduction:

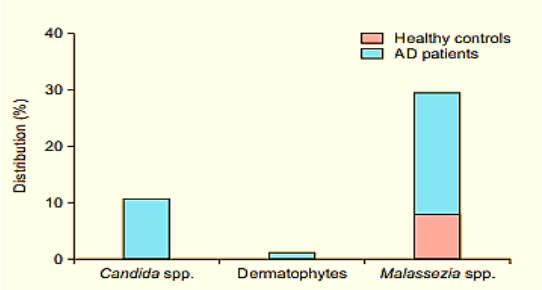
Atopic dermatitis (AD) is a recurrent inflammatory skin condition caused by a variety of circumstances. [1] AD is a difficult illness since it can be caused by a variety of causes, including genetic, environmental, and microbial. [2] Patients with Alzheimer's disease have a weaker skin barrier, making them more prone to microbial invasion. Due to a lack of interest and a limited methodological approach, extensive research on cutaneous fungal microbiota is limited in comparison to that on bacterial microbiota in Alzheimer's disease. Although enough study has not yet been conducted, numerous ideas emphasise the fungal load on disease development. For example, Alzheimer's disease patients who did not react well to standard treatment improved when given antifungal medications. Furthermore, it is known that the cutaneous fungal variety and richness are changed in Alzheimer's disease patients as compared to healthy persons. [3]

Methods:

Skin samples from AD outpatients and healthy people were taken and examined. Candida, dermatophytes, and Malassezia, three AD-associated fungal taxa, were studied utilising specialised primer and amplification approaches. The fungal distributions of both groups were compared after the amplicons were sequenced.

Results:

A total of 211 patients and 23 healthy people were examined. Candida species was found in 10.90% (23/211) of the 211 patients (Fig. 1.), but not in 0% (0/23) of the healthy people. Candida albicans was the most often identified species in patients (5.21 percent), followed by Candida parapsilosis (3.79%). 1.42 percent (3/211) of patients tested positive for dermatophytes, whereas 0% (0/23) of healthy people tested positive. Malassezia species were found in 20.85% (44/211) of patients and 8.70% (2/23) of healthy people, respectively. Malassezia restricta was the most often identified



Detection frequency of Candida spp., dermatophytes, and Malassezia spp. in healthy controls and patients with atopic dermatitis (AD). Candida spp. were detected in 10.90% AD samples and 0% samples from healthy controls. Dermatophytes were detected in 1.42% AD samples and 0% samples from healthy controls. Malassezia spp. were detected most frequently in 20.85% AD samples and 8.70% samples from healthy controls.

species in the Alzheimer's disease patient group and the only species discovered in the healthy control group.

Discussion:

While bacteria have been thoroughly investigated, the impacts of fungus have gone unnoticed. Fungi are not a direct cause of Alzheimer's disease because they are present in healthy people's skin, but they appear to contribute to the start and worsening of the disease. Local and global trials have shown a shift in the makeup of the fungal population in lesional or non-lesional skin of Alzheimer's disease patients. [4] This shift might be attributed to the changed physiological skin environment that occurs as Alzheimer's disease advances. Filaggrin mutation, for example, caused epidermal barrier failure in Alzheimer's disease patients. [5]

Malassezia is also linked to a number of human skin illnesses and disorders, with Malassezia restricta being the most common species in individuals with seborrheic dermatitis and Alzheimer's disease. M. restricta and M. globosa are considered to have a significant part in the development of Alzheimer's disease since these two Malassezia species are abundantly found in virtually all Alzheimer's patients, validating the study's conclusions. Because of their lipophilic nature, Malassezia is usually examined in sebum-rich regions such as the scalp, chest, and back. In this investigation, however, all swab samples were acquired from the antecubital region since it is the most prevalent location of AD and an easiest area to collect samples from. Furthermore, the skin microbiome exhibits phylogenic diversity based on body part.

Conclusion:

Finally, the study examined the distribution of Candida, dermatophytes, and Malassezia in the skin of Alzheimer's disease patients and healthy people. In Alzheimer's disease patients, the distribution of fungus in all three genera was changed. Malassezia species abundance and diversity were greater in AD patients than in healthy persons in this study. It is thought that the weakened skin barrier in AD allows for more diverse Malassezia colonisation than healthy skin. In turn, the changed mycobiome may activate the skin immune system, resulting in inflammation and eczema. Fungi are not a direct cause of AD based on the makeup of normal skin microflora, but an imbalance in their composition appears to be connected with AD development or aggravation.

The distribution of Candida spp., dermatophytes, and Malassezia spp. changes as AD progresses.

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A Pilot Study of the Diagnostic Efficacy of Electrical Impedance Spectroscopy Versus Dermoscopy for Pigmented Skin Lesions

Introduction:

Dermatologists must accurately identify concerning pigmented skin lesions (PSLs) for biopsy while avoiding biopsies for benign PSLs. Early detection and removal of melanocytic neoplasms remains the most important prognostic factor for favourable melanoma outcomes, according to evidence. [1] Electrical impedance spectroscopy (EIS) is a noninvasive, point-of-care diagnostic tool that can help clinicians decide whether to biopsy PSLs. Because benign and malignant tissues differ in cell shape, size, and molecular composition, EIS can measure the resulting differences in electrical impedance of different PSLs and generate risk of malignancy scores. The device generates a score ranging from 0 to 10, which corresponds to the likelihood that the tested lesion is melanoma. EIS scores ranging from 0 to 3 have a negative predictive value of 99%, whereas those ranging from 4 to 10 have progressively increasing positive predictive values ranging from 7% to 61%. When EIS was used to supplement clinical decision-making based solely on clinical morphology, the number needed to biopsy (NNB), a biopsy efficiency metric denoting the ratio of total biopsies to melanomas detected, decreased as well. [2] To better understand the clinical utility of EIS, the researchers looked at how this relatively new technology compares to traditional dermoscopy, specifically how it affects clinical decisions for PSLs.

Methods:

Dermatologists, dermatology residents, and medical students responded to an online survey that asked them about their biopsy decisions for 24 PSLs with varying histopathological diagnoses. Half of the lesions in each diagnosis group were presented as a clinical image with an accompanying dermoscopic image, while the other half were presented as a clinical image with the corresponding EIS score.

Results:

Decisions made with EIS had a mean sensitivity of 75% for melanomas/severely dysplastic nevi compared to 66% for dermoscopy decisions. While dermatologists had similar sensitivities when using EIS or dermoscopy (81% vs. 81%), residents and medical students had significantly higher sensitivity when using EIS. Using different biopsy ratings (1-5) as varying thresholds, a receiver operating characteristic (ROC) analysis revealed that with clinical photography, EIS produced an area under the curve (AUC) of 0.78, which was significantly greater than the AUC produced with dermoscopy (0.527; Figure 1). Respondents who reported

using dermoscopy only infrequently showed the greatest improvement in sensitivity and specificity when using EIS versus dermoscopy.

Discussion:

Dermatologists frequently face difficulties in detecting melanoma, especially in patients with multiple nevi. The clinical evaluation of PSLs takes into account both lesion-specific information and patient-derived melanoma risk factors. Even when all available clinical information is used, clinicians occasionally misdiagnose melanomas as benign lesions. Given the importance of early detection and treatment of melanoma on patient outcomes, improved evaluation tools may assist clinicians in both reducing patient morbidity associated with unnecessary excision of benign lesions and potentially lowering mortality by improving detection of malignant lesions. [3]

In this study, which compared the individual influences of EIS and dermoscopy on clinical decision-making, EIS-assisted decisions were more accurate than dermoscopy-assisted decisions. The level of training had a significant impact on the observed results. All butdermatologists saw an increase in the sensitivity of their biopsy decisions with EIS compared to dermoscopy, and all three saw an increase in the specificity of their biopsy decisions with EIS compared to dermoscopy.

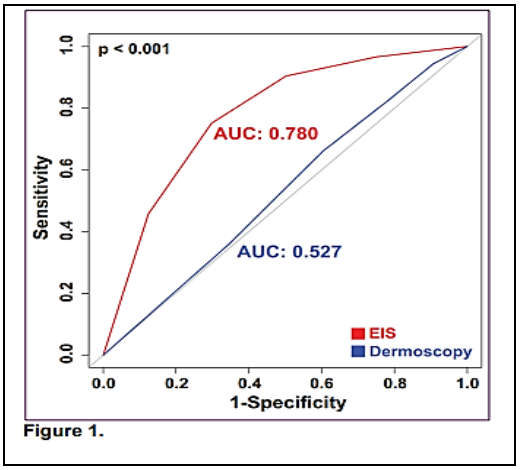

Figure 1.

It is worth noting that the EIS sensitivities (75% overall, 81% among attendings) found in this study are lower than those found in the EIS pivotal trial (97%), while the specificities (70% overall, 68% among attendings) are higher than those found in the pivotal trial (34%). This could be attributed to our survey format, in which respondents rated their willingness to biopsy each lesion on a scale of 1 to 5. Lesions rated 1-3 were considered unbiopsied for this analysis, while those rated 4-5 were considered biopsied. In comparison to the pivotal trial's binary biopsy option, this approach may have resulted in a higher number of lesions deemed unbiopsied, lowering sensitivity, and fewer lesions biopsied, increasing specificity. However, because this approach was applied equally to dermoscopy- and EIS-assisted biopsy decisions, relative accuracy was not affected.

Conclusion:

Implementing diagnostic tools that improve accuracy in the detection of malignant PSL is critical for improving patient outcomes and reducing unnecessary biopsies. In this pilot study, dermatologists made biopsy decisions with comparable sensitivity when using EIS or

dermoscopy. Those with less dermoscopy experience (e.g., residents, medical students) demonstrated significantly improved sensitivity when using EIS versus dermoscopy. Given that not all providers are trained in dermoscopy and that EIS benefits those who use it infrequently, EIS may complement dermoscopy by assisting a broader range of providers in making better PSL diagnostic decisions. This will eventually improve patient care and reduce the morbidity and mortality associated with a melanoma diagnosis.

Given that not all providers are trained in dermoscopy and that EIS benefits those who use it infrequently, EIS may complement dermoscopy by assisting a broader range of providers in making better PSL diagnostic decisions.

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Acute Partial-Thickness Burn: Hydrosurgical Debridement vs. Conventional Surgical Debridement

Introduction:

Partial-thickness burns frequently necessitate surgical excision followed by dressings or reconstruction. Early debridement (tangential excision of nonviable tissue) is standard of care, followed by split-thickness skin grafting. Debridement's goal is to reach a plane of viable tissue while sparing healthy, uninjured tissue, thereby accelerating healing and minimising scarring. Conventional debridement (scalpel or knife) may be limited by incorrect differentiation of viable and nonviable tissues, resulting in delayed healing and increased scarring. Hydrosurgery is a surgical debridement technique that uses pressurised saline and a vacuum system to create a Venturi effect, thereby improving debridement accuracy and tissue sparing. [1]

Methods:

The "Hydrosurgical debridement versus conventional surgical debridement for acute partial-thickness burns" systematic review examined existing randomised controlled trials (RCTs) enrolling participants with acute partial-thickness burn injuries requiring debridement and grafting; this yielded one eligible study randomising 61 paediatric patients to either conventional (n=31) or hydrosurgery (n=30). [2]

Results:

There were no significant differences in the mean time to complete healing (mean difference [MD] 0 days), postoperative infection risk, operative time (MD 0.2 minutes), or 6-month scar outcome in this RCT (MD not computed). The study conclusions had very low GRADE (Grading of Recommendations Assessment, Development, and Evaluation) certainty, a high risk of reporting bias, and were limited by the small sample size (not powered to detect differences in primary outcomes). Because the study focused on a paediatric population and smaller burn injuries (3%-4% of total body surface area), generalizability was limited. There was no information provided about clinical resource use, health-related quality of life, or adverse events. The authors concluded that it is unclear whether hydrosurgery is superior to conventional surgery for treating middepth burns.

Discussion:

Following the publication of the Cochrane review, no further RCTs comparing the efficacy of hydrosurgical debridement to conventional blade debridement for burns have been published.

However, one study is still "awaiting classification," and a multicenter RCT (n=137) is being conducted to compare long-term (12 months) scar quality for hydrosurgical versus conventional dermal burn debridement. In addition to treating burns, there is evidence that hydrosurgery can treat other dermatological pathologies. In a study of axillary osmidrosis (n=93), for example, hydrosurgery improved patient satisfaction and had fewer postoperative complications than traditional surgery [3]. Case reports of severe phymatous rosacea, which currently lacks standard surgical guidelines, show that hydrosurgery can be effective [4]. Furthermore, in outpatient settings, hydrosurgery can safely and quickly debride various ulcer types [5].

Conclusion:

As the COVID-19 pandemic reduces the availability of inpatient rooms and services, the ability to provide outpatient hydrosurgical debridement for wounds may be critical for patient care. Dermatologists manage a large number of wounds on a daily basis; therefore, providers should be aware of the most recent wound debridement recommendations. Additional high-quality RCTs comparing the efficacy of hydrosurgery versus standard debridement for burns should be included in future research. Patient-reported scarring and adverse events could be used as outcome measures. This would increase the results' certainty and generalizability, as well as provide evidence for procedural recommendations.

Hydrosurgery, a non-invasive alternative to blade debridement, simultaneously debrides, irrigates, and removes tissue while minimising damage to uninjured tissue. Despite its increasing use, the efficacy of hydrosurgery and the risk of adverse events following burn surgery are unknown.

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A case report on Blueberry muffin baby syndrome: a critical early warning sign of systemic disease

Introduction:

Blueberry muffin baby syndrome is a rare and non-specific clinical manifestation in newborns characterised by widespread, maculopapular lesions of blue-red or violaceous colour and cohesive consistency. [1] Skin lesions are caused by extramedullary hematopoiesis, which can be caused by intrauterine viral infections (TORCH syndrome), hematologic dyscrasias (twin-to-twin transfusion syndrome, hereditary spherocytosis, newborn haemolytic disease), or neoplasms (mastocytosis, histiocytosis, neuroblastoma, rhabdomyosarcoma, leukaemia). [2]

Case Report:

The article describes the case of a male infant born in gestation week 39 by normal vaginal delivery with a birth weight of 3320 g, an Apgar score of 10/10, and blood type AB RhD +. The mother was a healthy 33-year-old woman, and the father was a 32-year-old man with no family history of any kind. The baby's skin had a "blueberry muffin appearance," with widespread purple papules and nodules up to 1 cm in diameter disseminated on the scalp, face, truck, and limbs (Figures 1 and 2). The lesions worsened over the next few days.

The physical examination results were otherwise unremarkable.

Laboratory tests revealed a decrease in white blood cells (WBC values ranged from 6.6 to 7.2 109), and a differential blood count (DBC) revealed that neutrophils were 11%, eosinophils were 9%, and lymphocytes were 74%. Prothrombin time (PT) and international normalised ratio (INR) (up to 1.23), as well as mild elevations of aspartate aminotransferase and hyperglycemia, were observed. There was also a transient increase in C-reactive protein (up to 38.82 mg/dl). Blood cultures were negative on multiple occasions. An ophthalmic exam revealed an oval optic nerve shield with peripheral pallor.

The newborn developed tachypnoea on the second day of hospitalisation. A chest X-ray revealed symmetric linear opacities in the upper pulmonary fields, and transthoracic ultrasound confirmed transient neonatal tachypnea. Amikacin and ampicillin were administered systemically, resulting in rapid improvement. Apart from the transient tachypnea, the overall clinical condition was good, and the skin lesions progressed gradually. On the ninth day, the infant was referred to the Haematology Department for a skin biopsy. There was still leukopenia with neutropenia (323/mm3) and lymphocytosis. The suspicious nodule's histology revealed a dense infiltrate of blast cells (Figure 3).

Immunophenotyping revealed a mononuclear population expressing CD15, MPO, CD34, CD56, CD4, CD31, CD71, CD68/PGM, and CD68/KP1 (Figures 4 A, B). The proliferative index Ki-67 was 60%. The genetic testing for Kostmann disease and inherited neutropenia came back negative. There were no pathologic cells found in the cerebrospinal fluid. Blastosis in myelogram was determined to be 0% with granulocyte inhibition of maturation at the myelocyte and promyelocyte stages. Acute myeloid leukaemia, FrenchAmerican-British (FAB) type M4, was diagnosed. The AMLBFM 2012 treatment scheme (AIE, Ara-C, HAM, AI/2-CDA) was used.

According to WHO, the therapy caused multiple septic complications and grade IV hematologic toxicity. A relapse was confirmed in bone marrow and eye orbit histopathologic examinations after 6 months (cellular infiltrate positive for CD68+, CD 15+; Ki-67 was 70%). The patient's disease progressed, and he died within a year of being diagnosed.

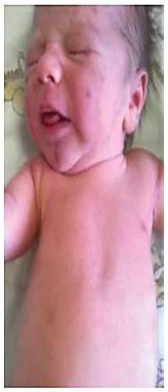

Figure 1. Disseminated violaceous lesions with a predilection to facial area

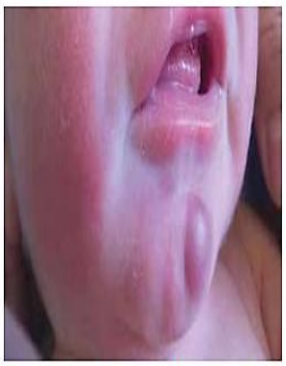

Figure 2. Well-demarcated, firm violaceous nodule on the patient's face

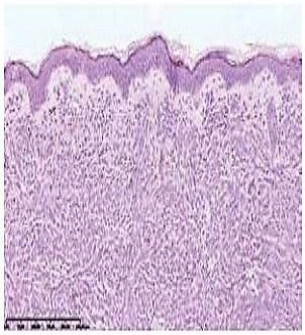

Figure 3. Dense dermal infiltrate of blast cells (haematoxylin and eosin staining, 20× magnification)

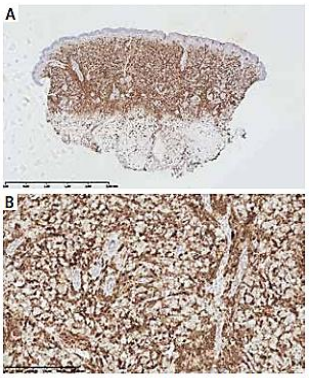

Figure 4. Dense infiltrates of mononuclears in dermis and subcutis with a positive CD15 immunohistochemistry staining (distinguishing marker for human myeloid cells; A – 2× magnification, B – 40× magnification, respectively)

Discussion:

Congenital leukaemia (CL) is a type of leukaemia that develops within the first month of life. The following criteria are used to make the diagnosis: I immature cell proliferation in the myeloid, lymphoid, or erythroid series, (ii) infiltration into extrahematopoietic tissue, and (iii) the absence of other disease that mimics this proliferation. Hepatosplenomegaly (present in 80% of cases), central nervous system involvement (50%), lymphadenopathy (25%), lethargy, pallor, anaemia, and leucocytosis are symptoms of leukaemia. [3] These were missing in the presented case, making the diagnosis even more difficult. The cutaneous infiltration of malignant leukocytes was the distinguishing feature in our patient. The prevalence of leukaemia cutis in CL infants ranges from 15% to 60%, and it may be the first manifestation of systemic disease in half of them.

The most common histopathological pattern is a dense infiltrate of leukemic cells in a linear pattern between collagen bundles in the reticular dermis that extends into the subcutis. Malignant myeloid cells predominate in the infiltrate and appear cytologically monotonous and homogeneous. The causes of CL are unknown, but it has been linked to maternal radiation exposure, bioflavonoids in the diet, marijuana use, alcohol consumption, illicit drugs, viral infections, and inherited conditions such as Down's syndrome or Bloom's syndrome, among others. Despite recent advances in CL therapy, it is still thought to have a rapidly deteriorating course; only 20-23% of children survive at 24 months.

Conclusion:

To summarise, this study presents a one-of-a-kind case of congenital leukaemia with initial aleukemic manifestation. There is currently no validated diagnostic algorithm for "blueberry muffin syndrome." After ruling out intrauterine infections and hematologic dyscrasias, the study strongly suggests that the next mandatory diagnostic step is to look for the underlying neoplastic disorder. Skin biopsy, immunohistochemistry staining, and cytologic and cytogenetic data are all required to determine the source of the infiltrate. To assess any malignant systemic involvement heralded by typical cutaneous nodules, DBC with percent blast cells, bone marrow aspirate with cytogenetic analysis, and imaging studies such as chest X-ray, ultrasonography of abdomen and pelvis, and brain tomography are required.

Blueberry muffin baby syndrome is a rare and non-specific clinical manifestation in newborns that is distinguished by widespread, maculopapular lesions of blue-red or violaceous colour and cohesive consistency.

Reference:

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