ORIGINAL REPORT

Molecular Classification in a Cohort of Occupational Dermatological Patients: Diagnostic Results and Course of Ability to Work and Sick Leave Over Two Years

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Hand eczema is the most common occupational skin disease (OSD), often leading to sick leave or job termination. Standard diagnostic procedures are often ambiguous. Molecular classification has been described to improve differentiation between eczema and psoriasis, which is the most common differential diagnosis. Since 2020, a cohort of 287 patients with suspected, occupational hand and/or foot dermatoses (eczema or psoriasis) has been established in Germany. The current analysis focuses on descriptive results on the days of absence from work, occupational retention and legal recognition of OSD after 24 months. A total of 38.9% of the patients did not receive a distinct clinical diagnosis, while molecular diagnostics provided results in 93.1% of these cases. Sick leave days significantly decreased over 2 years ($p<0.005$) from a mean of 28.7 to 8.2 days. Legal recognition of OSD tripled from 10.1% to 30.2%. Job terminations due to skin diseases reached 27.1%, primarily from job changes or unemployment. Molecular diagnostics enhance diagnostic precision and may support improved prevention and disease management, reducing sick leave. The findings underscore the individual severity and social impact of skin diseases like eczema and psoriasis in high-risk employments.

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SIGNIFICANCE

Hand eczema is the most common work-related skin disease and often affects people in healthcare, metalwork, cleaning or food jobs. It can cause sick leave and even job loss. A study tested a new molecular method to better distinguish eczema from psoriasis, since many cases are hard to diagnose. Among 287 patients, this test gave clearer results than traditional methods. After 2 years, sick leave days dropped from about 29 to 8 on average, and 73% of patients kept their jobs. The study is still ongoing but shows first promising results that the new method could improve patient care.

Hand eczema (HE) has a substantial health economic and socio-medical impact with considerable occupational, domestic, social and psychological consequences (1). HE is the most common occupational skin disease (OSD) (2), which makes up 10% of all occupational diseases in Germany (3). The prevalence in so-called high-risk occupations is up to 40% (4, 5) . This includes wet-work occupations like healthcare workers, metal workers, hairdressers and cleaners, and also occupations with mixed exposures like those of the food industry, wood workers and florists (5–7). In those with severe and very severe HE, working can often be heavily impaired or is not possible due to severe inflammation of the skin. Chronic disease courses bear a high risk of acquiring additional type-IV sensitizations leading to allergic contact dermatitis (8). In the long term, this can cause high numbers of days of sick leave and resigning from or changing the occupation (9). A recent meta-analysis numbered the mean total societal costs per year per patient up to €7,738 (10). Another systematic review and meta-analysis demonstrated that HE has a moderate-to-severe impact on health-related quality of life (HrQoL) with a strong correlation between disease severity and impact on quality of life (11). Consequently, topical and systemic treatments, diagnostics and the implementation of measures of prevention are important to maintain the ability to work (12).

Diagnosis of HE involves medical history, clinical examination, patch testing, microbiology tests and skin biopsy examination (5). However, a distinct diagnosis can be challenging and is mostly based on ruling out differential diagnoses (13), especially due to morphological similarities. Psoriasis is of particular

importance as it is the most important differential diagnosis of eczema. Besides, psoriasis can also show clinical features of eczema. Dermatohistopathological analyses also often lack discriminatory abilities (14). However, since treatment for moderate-to-severe courses of both diseases (especially when it comes to new and cost-intensive systemic treatments like biologics) differs greatly, a precise diagnosis is crucial to reach treatment success, patient satisfaction and to avoid unnecessary costs. Notably, psoriasis is only recognized as OSD in very specific locations and constellations within the German legal system (15). Distinct diagnostics are therefore also crucial to prevent unjustified societal costs.

After successful single case uses (16), a systematic application of molecular diagnostics has been implemented in the division for occupational dermatology at Heidelberg University Hospital (17, 18). This method uses the disease-specific regulation of the genes NOS2 and CCL27 derived from a skin tissue biopsy to calculate the probability of psoriasis over eczema (19, 20). Recent results have shown high precision of this diagnostic tool in the face of difficult differential diagnostics of both diseases and overlapping disease patterns (21, 22). Methods of molecular classifications are embedded in a broader effort to establish biomarkers in the differentiation of psoriasis and eczema (23). The aim of this study is to investigate whether patients diagnosed through molecular classification have milder disease courses, fewer days of sick leave, higher HrQoL and higher rates of job retention than an existing, comparable cohort, where molecular classification was not yet available. It is hypothesized that an early, distinct diagnosis leads to a more specialized treatment with higher treatment success.

METHODS

In November 2020, a cohort of occupational dermatology patients was implemented. Inclusion criteria were patients of 18 years and older, giving informed consent and having a suspected diagnosis of psoriasis palmo-plantaris or eczema palmo-plantaris of likely occupational origin. Additional locations on the hand and body could also be affected. The study was announced and published in multiple dermatological journals and through the Working Group for Occupational and Environmental Dermatology (ABD e.V.). It was explicitly aimed to include patients with various disease courses, severities, durations and treatment histories, not only from specialized dermatological clinics, in order to get a broad impression on their individual development of their skin disease in longitudinal monitoring. They were recruited from a voluntary sample of 62 study centres all over Germany, 60% from private practices and 40% from hospitals, which were also responsible for ensuring compliance with the inclusion criteria. Whenever a patient was found to be suitable, the study centres contacted the principal investigator at Heidelberg, Germany. The study centre then received written and oral information about all aspects and criteria of the study, as well as questionnaires. After having given informed consent, a 4-mm skin biopsy of the lesional skin was taken which was then sent to the cooperating lab at Technical University Munich, where the molecular diagnostics was performed. The results were then given to the study centre and the patients' dermatologists. Patients and their dermatologists receive standardized questionnaires to collect the same data at baseline and 4 follow-up points over 3 years (6, 12, 24 and 36 months). Patients provided socio-demographic information, number of days of sick leave due to their skin disease in the preceding 12 months, job retention, as well as onset, course and localization of their skin disease. HrQoL was assessed by standardized measurements (Dermatology Life Quality Index (DLQI) and Quality of Life in Hand Eczema Questionnaire (QOLHEQ)). Dermatologists provided information on the suspected clinical diagnosis, treatment at the expense of a social accident insurance, legal recognition as OSD, reduction in earning capacity, disease severity and used systemic and topical treatments. The patients remained in the exclusive care of their treating dermatologist throughout the whole study. The study team did not intervene in any way in the further treatment of the included patients. The treating dermatologists solely provided information on the treatments they used since the last follow-up. Primary endpoints of the study were days of absence from work and occupational retention in a 12, 24 and 36-month follow-up. Secondary endpoints were severity of skin disease, duration of skin disease, local and systemic therapies and HrQoL. After completion, data will be compared to an existing, occupational dermatological cohort with comparable skin diseases, where molecular classification was not yet available. The method and the general aims have also been described in detail elsewhere (24). The study is currently ongoing and we are presenting a sub-analysis of the completed 2-year follow-up focusing on descriptive results of diagnosis, ability to work and sick leave in the intervention cohort. After final data curation and analyses, comparisons with the control group will be reported.

Cohen’s Kappa was used to assess the concordance between types of diagnoses (dermatohistopathological and molecular). Chi-square statistics were used to test for statistical associations. Confidence intervals (CI) and Cramér's V were used to assess the relevance of the findings. Where applicable, p-values<0.05 were considered statistically significant. Analyses were

conducted using R (Version 4.4.1) with packages "ggstatsplot" (Version 0.12.4), "stats" (Version 4.4.1) and "psych" (Version 2.4.1.6.26).

RESULTS

Recruitment ended in November 2022, resulting in 287 patients (53.3% male). The mean age of patients was 50.4 years (standard deviation (SD): ±12.2 years). The socio-demographic aspects are an excerpt. Values not adding up to 100% are due to missing values and marginally reported answer categories. Further demographic data have been published before elsewhere [17].

The majority of the cohort had completed an apprenticeship (63.4%, *n*=161). In total, 91.5% were employed, a minority was in training (2.3%) or self-employed (4.3%). At baseline (T0), 20.8% (*n*=52) of participants were employed in the metalworking industry, 20.4% (*n*=51) in healthcare professions, 8.4% (*n*=21) in the construction industry and 7.2% (*n*=18) in food or catering professions. The remaining percentage was distributed among other occupational groups such as cleaning, warehousing, woodworking or hairdressing; 20.2% reported a household income of €2,000–2,600/month; 44.62% reported a higher income; 18.29% reported a lower income than that. The level of education is significantly higher among the female participants: Compared to men (M), women (F) are almost twice as likely to have a high school diploma (F: 22%, M: 13%), and 11% are more likely to have a secondary school diploma (F: 49%, M: 38%). Accordingly, the proportion of academically educated women is more than three times as high as that of men (M: 4%, F: 13%).

Skin diseases were reported on average for 6.5 years (SD:±7.9 years) with a range of <1–48 years. A total of 18.9% (*n*=48) had already suffered from skin disease for at least 10 years. Affected body localizations were mainly the hands (86.2%, *n*=244) and the feet (49.8%, *n* = 141), as well as the legs (22.6%, *n*=64). On the hands, the palms (72.4%, *n*=177), the interdigital spaces (40.9%, *n*=100) and the backs of the hands (28.6%, *n*=70) were primarily affected.

Clinical diagnosis by the dermatologist was eczema in 36.6% (*n*=99) and psoriasis in 24.6% (*n*=67) of the cases. No clear diagnosis was made in 38.9% (*n*=106) of the patients. The same patients were diagnosed through molecular classification. It resulted in 68% (*n*=185) diagnoses of eczema and 25% (*n*=68) of psoriasis. A much lesser amount of 6.9% (*n*=19) did not receive a diagnosis this way. In 15 cases, one of the diagnostic measures was missing and could not be included in the analysis.

In 146 cases, the results of the dermato-histopathological analysis of the skin biopsies taken are also available. In 49.3% of the cases, the findings indicated the presence of eczema, in 28.1% psoriasis, and in 22.6%, the findings remained histologically unclear. The overall concordance with molecular diagnostics was 46.4%. Regarding chance-adjusted agreement, a Cohen's Kappa value of κ=0.2 (95% CI: 0.01–0.24) calculated, indicating moderate agreement. A weak statistical association was found ($\chi^2(4)=10.46$, $p=0.03$, Cramers V=0.19). The proportion of individuals reporting a job termination after 24 months (T4) was 27.1% (35), based on 129 already recorded datasets. Of these participants, 20% (7) had retired, 22.8% (8) were currently unemployed, 54.3% (19) changed their job due to the skin condition and 1 person was on long-term sick leave. Twenty-eight patients had a molecular diagnosis of eczema, 4 of psoriasis and 3 cases remained unclear. Compared to the overall molecular results, this means that 15.1% of eczema patients and 5.9% of psoriasis patients terminated their job.

The overall number of days of sick leave decreased statistically significantly ($p<0.005$) from a mean of 28.7 days at study inclusion to 8.2 days after 2 years. The median amount dropped from 1 day to 0 days, indicating the high dispersion of this variable. In longitudinal monitoring, this dispersion reduces; however, at T4 (SD (baseline): 54.2, SD (T4): 27.3), only 11.6% of participants reported sick leave days ranging from 7 to 200 days within the past 12 months, compared to 41.5% at T0.

At baseline, 10.1% had an OSD as defined by the special legal definition in Germany (BK 5101), 83.5% did not and in 6.5%, it was unsure or the decision process had not been finished yet. Twenty-four months later, based on 90 already recorded datasets, the amount of legally recognized OSD increased threefold (30.2%). Cases in which the legal status was unsure or the decision was pending increased by one-third (9.4%). When contrasting the individual cases, one can see that none of the now unsure cases were also unsure at baseline. Rather, new cases (formerly with/without legal recognition) now turned unsure.

DISCUSSION

We present descriptive, longitudinal data on job retention, sick leave days and legal recognition of an OSD of occupational dermatological patients having received molecular diagnostics for enhanced differentiation between eczema and psoriasis. About 40% of the patients did not receive a distinct clinical diagnosis. Using molecular classification, most of these cases could be resolved. In longitudinal monitoring, we saw a job retention

rate of 72.9% after 2 years, an increase in legal recognitions of OSD and a significant reduction in sick leave days.

The proportion of participants employed in high-risk industries such as metalworking or healthcare is consistent with prior epidemiological findings that associate these sectors with increased exposure to irritants and allergens resulting in high incidence rates of eczema (7).

The chronicity of skin disease and localization on hands (86.2%) and feet (49.8%) is reflective of the significant burden posed by these diseases. Studies emphasize that such localizations, particularly on the hands, significantly impair quality of life and functional capacity due to the high visibility and physical demands of these areas (25, 26). The substantial proportion of patients in this study with disease duration exceeding 10 years further underscores the chronic, refractory nature of these conditions and highlights the need for improved therapeutic strategies (8).

A noticeable finding of this study is the discrepancy between clinical and molecular diagnostic methods. This low agreement, despite weak statistical significance, highlights the potential challenges clinicians face when differentiating between eczema and psoriasis. Misdiagnosis can have significant implications for management, as these conditions require distinct treatment modalities. Similar diagnostic discrepancies have been reported, with studies advocating for the incorporation of advanced molecular techniques to enhance diagnostic precision (27, 28).

The higher concordance between molecular diagnostics and dermatohistopathology (46.4%, κ=0.2) suggests that histopathological analysis remains a valuable confirmatory tool, although its limitations in differentiating overlapping features of chronic inflammatory skin diseases are well documented (14, 21, 29). This finding aligns with the growing recognition of molecular profiling as a complementary tool to improve diagnostic accuracy in dermatology (23, 30, 31).

The occupational implications of skin disease in this cohort are profound. The job termination rate over 24 months, with over half of these cases directly attributed to skin conditions, reflects the hindering impact on employment. These findings are consistent with prior research indicating that chronic dermatological conditions are a significant cause of work disability and job changes (32–34). Patients with suspected psoriasis hereby showed a much lesser job termination rate than patients with suspected eczema. This is in line with the fact that psoriasis can only be legally recognized as OSD in Germany in very specific constellations, in which the disease was not triggered by everyday activities, but exclusively by occupational ones (15).

One study showed that 20.5% of patients reported absence from work in the past 12 months (35), while another study showed the same for 57% of the patients (5, 36). Sick leave was reported for up to 5 weeks and more in 12% of cases (37). Our analysis shows that the baseline data (41.5%) is in line with these other findings. Our population shows clearly lower times of reported sick leave days over 24 months. This statistically significant reduction could be attributed to successful preventive measures and improved disease management, especially specific treatments. The median reduction from one to zero sick days is potentially a form of presenteeism, a phenomenon where individuals work despite being sick. This would align with the literature reporting presenteeism in populations facing chronic skin conditions, especially in high-risk occupations and moderate and severe-to-very-severe HE (38) like the participants in this cohort. Presenteeism can hereby result from intrinsic motivations (e.g. enjoying one job or not wanting to give in to an impairment) or be triggered by extrinsic factors, like the perception of being a burden to others or not meeting expectations (39). However, presenteeism may exacerbate disease progression and underscores the need for workplace accommodations.

The threefold increase in legally recognized OSD cases (from 10.1% to 30.2%) demonstrates progress in the legal acknowledgment of work-related skin diseases over time. However, the concurrent rise in unsure cases (from 6.5% to 9.4%) suggests a persistent need for clearer criteria and streamlined diagnostic processes to expedite the legal decision on OSD.

Since this is an ongoing study, the results can still vary with increasing amount of data available. The findings can be biased by participants no longer responding to questionnaires once their skin disease is healed; therefore, a predominance of more severe cases can exist. The job termination rate in this analysis is patient-reported and does not necessarily have to correspond to the legal definition. In 2021, the German social insurance law terminated the obligation to refrain from professional activities to have an OSD recognized legally. This led to a strong increase in OSD cases, which must be attributed when discussing our findings on OSD recognition (2). Another limitation is that the study did not investigate the relation of type of HE subtypes and molecular diagnostics and did not collect data on patch testing.

In conclusion, these analyses show high discrepancies between different forms of diagnostics and large amounts of clinically unclear cases, underscoring the need for improved diagnostics, especially for high-risk occupational groups, which are mostly affected by OSD. We see strong reductions in times of sick leave.

These results can contribute to a growing body of data on the multifaceted challenges posed by dermatological conditions in working populations and provide a foundation for future research to enhance patient care.

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Data availability statement: The research project is ongoing. Data cannot be shared at this point.

Ethics committee: The study was approved by the Heidelberg Ethics Committee (S-506/2019).

Conflict of interest: PB is a research associate in the research project supported by the German Social Accident Insurance (DGUV) and is funded through it. KE is a shareholder of Dermagnostix and a speaker and/or advisory board member for AbbVie, Almirall, BMS, Janssen, Leo, Lilly, Novartis, Pfizer, Sanofi, and UCB. EW is the principal investigator of the DGUV-supported research project FB 323 on the molecular classifier. CP served as a consultant and/or has received honorariahonouraria from Bristol-Myers Squibb, Merck Sharp & Dohme, Novartis, Sanofi, Sunpharma, Pierre Fabre, AbbVie, Kyona Kirin and Amgen and received travel support from Amgen, Merck Sharp & Dohme, Bristol-Myers Squibb, Pierre Fabre, Sunpharma and Novartis, outside the submitted work. The other authors have no conflicts of interest to declare.

REFERENCES

1. Cazzaniga S, Ballmer-Weber BK, Gräni N, Spring P, Bircher A, Anliker M, et al. Medical, psychological and socio-economic implications of chronic hand eczema: a cross-sectional study. J Eur Acad Dermatol Venereol 2016; 30: 628–637. https://doi.org/10.1111/jdv.13479
2. John SM, Symanzik C, Skudlik C. Hand eczema and statutory accident insurance-what you should know for your practice. Dermatologie 2023; 74: 393–401. https://doi.org/10.1007/s00105-023-05138-1
3. Brans R, Hübner A, Gediga G, John SM. Prevalence of foot eczema and associated occupational and non-occupational factors in patients with hand eczema. Contact Derm 2015; 73: 100–107. https://doi.org/10.1111/cod.12370
4. Alfonso JH, Bauer A, Bensefa-Colas L, Boman A, Bubas M, Constandt L, et al. Minimum standards on prevention, diagnosis and treatment of occupational and work-related skin diseases in Europe - position paper of the COST Action StanDerm (TD 1206). J Eur Acad Dermatol Venereol 2017; 31: 31–43. https://doi.org/10.1111/jdv.14319
5. Thyssen JP, Schuttelaar MLA, Alfonso JH, Andersen KE, Angelova-Fischer I, Arents BWM, et al. Guidelines for diagnosis, prevention, and treatment of hand eczema. Contact Derm 2022; 86: 357–378. https://doi.org/10.1111/cod.14035
6. Vindenes HK, Svanes C, Lygre SHL, Hollund BE, Langhammer A, Bertelsen RJ. Prevalence of, and work-related risk factors for, hand eczema in a Norwegian general population (The HUNT Study). Contact Derm 2017; 77: 214–223. https://doi.org/10.1111/cod.12800
7. Jamil W, Svensson Å, Josefson A, Lindberg M, Von Kobyletzki L. Incidence rate of hand eczema in different occupations: a systematic review and meta-analysis. Acta Derm Venereol 2022; 102: adv00681. https://doi.org/10.2340/actadv.v102.360
8. Weisshaar E. Chronic hand eczema. Am J Clin Dermatol 2024; 25: 909–926. https://doi.org/10.1007/s40257-024-00890-z
9. Dietz JB, Menné T, Meyer HW, Viskum S, Flyvholm M, Ahrensbøll-Friis U, et al. Occupational contact dermatitis among young people in Denmark—a survey of causes and long-term consequences. Contact Derm 2022; 86: 404–416. https://doi.org/10.1111/cod.14050
10. Armstrong A, Hahn-Pedersen J, Bartlett C, Glanville J, Thyssen JP. Economic burden of chronic hand eczema: a review. Am J Clin Dermatol 2022; 23: 287–300. https://doi.org/10.1007/s40257-021-00669-6
11. Siewertsen M, Näslund-Koch C, Duus Johansen J, Simonsen AB, Nguyen TT, Zachariae C, et al. Psychological burden, anxiety, depression and quality of life in patients with hand eczema: a systematic review and meta-analysis. J Eur Acad Dermatol Venereol 2024; 38: 2110–2117. https://doi.org/10.1111/jdv.20140
12. Weidinger S, Novak N. Hand eczema. Lancet 2024; 404: 2476–2486. https://doi.org/10.1016/S0140-6736(24)01810-5
13. Silvestre Salvador JF, Romero-Pérez D, Encabo-Durán B. Atopic dermatitis in adults: a diagnostic challenge. J Investig Allergol Clin Immunol 2017; 27: 78–88. https://doi.org/10.18176/jiaci.0138
14. Kolesnik M, Franke I, Lux A, Quist SR, Gollnick HP. Eczema in psoriatico: an important differential diagnosis between chronic allergic contact dermatitis and psoriasis in palmoplantar localization. Acta Derm Venereol 2018; 98: 50–58. https://doi.org/10.2340/00015555-2779
15. Mahler V, Diepgen T, Skudlik C, Becker D, Dickel H, Fartasch M, et al. Psoriasis predisposition and occupational triggering factors in the appraisal of occupational medical expertises. J Dtsch Dermatol Ges 2014; 12: 519–529. https://doi.org/10.1111/ddg.12262
16. Weisshaar E, Gazorz-Stark N, Eyerich K. Ekzem oder Psoriasis? Eine spezielle Herausforderung in der Berufsdermatologie. DB 2018; 66: 113–119. https://doi.org/10.5414/DBX00325
17. Bentz P, Eyerich K, Skudlik C, Schröder-Kraft C, Löffler H, Pföhler C, et al. Hand eczema or psoriasis: update on the FB 323 study occupational dermatology cohort. Dermatologie 2023; 74: 402–409. https://doi.org/10.1007/s00105-023-05156-z
18. Bentz P, Eyerich K, Weisshaar E. Psoriasis or eczema? One-year results from the DGUV research project FB323 with application of the molecular classifier in occupational dermatoses. J Dtsch Dermatol Ges 2022; 20: 1233–1234. https://doi.org/10.1111/ddg.14850
19. Fischer F, Doll A, Uereyener D, Roenneberg S, Hillig C, Weber L, et al. Gene expression-based molecular test as a diagnostic aid for the differential diagnosis of psoriasis and eczema in formalin-fixed and paraffin-embedded tissue, microbiopsies, and tape strips. J Invest Dermatol 2023; 143: 1461–1469. https://doi.org/10.1016/j.jid.2023.02.015
20. Quaranta M, Knapp B, Garzorz N, Mattii M, Pullabhatla V, Pennino D, et al. Intraindividual genome expression analysis reveals a specific molecular signature of psoriasis and eczema. Sci Transl Med 2014; 6: 244ra290. https://doi.org/10.1126/scitranslmed.3008946
21. Eyerich K, Garzorz-Stark N. Back to broad? How molecular profiling facilitates targeted therapies of overlapping phenotype. J Invest Dermatol 2024; 144: 3–4. https://doi.org/10.1016/j.jid.2023.08.001
22. Lauffer F, Eyerich K. Eczematized psoriasis—a frequent but often neglected variant of plaque psoriasis. J Dtsch Dermatol Ges 2023; 21: 445–453. https://doi.org/10.1111/ddg.14991
23. Bentz P, Weisshaar E. Biomarkers as key concepts in managing atopic dermatitis and psoriasis: unlocking new ways of care for patients with chronic hand dermatoses. Br J Dermatol 2024; 191: 3–4. https://doi.org/10.1093/bjd/ljae127

24. Bentz P, Eyerich K, Weber K, Kluge L, Ofenloch R, Weisshaar E. Kohortenstudie zur Langzeitbeobachtung von Patienten, bei denen der sog. "molekulare Klassifikator" zur Unterscheidung von Ekzem und Psoriasis eingesetzt wurde. Hautarzt 2021; 72: 354–357. https://doi.org/10.1007/s00105-021-04774-9
25. Van Beugen S, Schut C, Kupfer J, Bewley AP, Finlay AY, Gieler U, et al. Perceived stigmatization among dermatological outpatients compared with controls: an observational multicentre study in 17 European countries. Acta Derm Venereol 2023; 103: adv6485. https://doi.org/10.2340/actadv.v103.6485
26. Zalewski A, Krajewski PK, Szepietowski JC. Psychosocial consequences of hand eczema—a prospective cross-sectional study. J Clin Med 2023; 12: 12. https://doi.org/10.3390/jcm12175741
27. Renert-Yuval Y, Thyssen JP, Bissonnette R, Bieber T, Kabashima K, Hijnen D, et al. Biomarkers in atopic dermatitis-a review on behalf of the International Eczema Council. J Allergy Clin Immunol 2021; 147: 1174–1190. https://doi.org/10.1016/j.jaci.2021.01.013
28. Ziehfreund S, Tizek L, Hangel N, Fritzsche MC, Weidinger S, Smith C, et al. Requirements and expectations of high-quality biomarkers for atopic dermatitis and psoriasis in 2021-a two-round Delphi survey among international experts. J Eur Acad Dermatol Venereol 2022; 36: 1467–1476. https://doi.org/10.1111/jdv.18178
29. Kim JE, Lee J, Huh YJ, Kim K, Chaparala V, Krueger JG, et al. Genomic profiling of the overlap phenotype between psoriasis and atopic dermatitis. J Invest Dermatol 2024; 144: 43–52. https://doi.org/10.1016/j.jid.2023.06.194
30. Gebhardt C, Eyerich K, Garzorz-Stark N. Status quo and future perspectives of molecular diagnostics in dermatology. J Dtsch Dermatol Ges 2023; 21: 415–418. https://doi.org/10.1111/ddg.15010
31. Tizek L, Schuster B, Gebhardt C, Reich K, von Kiedrowski R, Biedermann T, et al. Molekulardiagnostik in der Dermatologie: Eine Online-Umfrage zur Untersuchung von Nutzung, Hürden und Anforderungen in Deutschland. J Dtsch Dermatol Ges 2022; 20: 287–296. https://doi.org/10.1111/ddg.14659_g
32. Nørreslet LB, Ebbehøj NE, Ellekilde Bonde JP, Thomsen SF, Agner T. The impact of atopic dermatitis on work life—a systematic review. J Eur Acad Dermatol Venereol 2018; 32: 23–38. https://doi.org/10.1111/jdv.14523
33. Eckert L, Gupta S, Amand C, Gadkari A, Mahajan P, Gelfand JM. Impact of atopic dermatitis on health-related quality of life and productivity in adults in the United States: an analysis using the National Health and Wellness Survey. J Am Acad Dermatol 2017; 77: 274–279. https://doi.org/10.1016/j.jaad.2017.04.019
34. Hong J, Koo B, Koo J. The psychosocial and occupational impact of chronic skin disease. Dermatol Ther 2008; 21: 54–59. https://doi.org/10.1111/j.1529-8019.2008.00170.x
35. Halioua B, Skayem C, Merhand S, BenHayoun Y, Taieb C, Richard MA. Chronic hand eczema in France: occupational impact and work absenteeism. Clin Exp Dermatol 2025; 50: 1044–1046. https://doi.org/10.1093/ced/llae522
36. Cvetkovski RS, Zachariae R, Jensen H, Olsen J, Johansen JD, Agner T. Quality of life and depression in a population of occupational hand eczema patients. Contact Derm 2006; 54: 106–111. https://doi.org/10.1111/j.0105-1873.2006.00783.x
37. Diepgen TL, Andersen KE, Brandao FM, Bruze M, Bruynzeel DP, Frosch P, et al. Hand eczema classification: a cross-sectional, multicentre study of the aetiology and morphology of hand eczema. Br J Dermatol 2009; 160: 353–358. https://doi.org/10.1111/j.1365-2133.2008.08907.x
38. Brands MJ, Loman L, Roelen CAM, Bültmann U, Schuttelaar MLA. Hand eczema-related presenteeism and sickness absence: a cross-sectional population-based study. Contact Derm 2024; 90: 372–377. https://doi.org/10.1111/cod.14510
39. Oosterhaven JAF, Flach PA, Bültmann U, Schuttelaar MLA. Presenteeism in a Dutch hand eczema population—a cross-sectional survey. Contact Derm 2018; 79: 10–19. https://doi.org/10.1111/cod.12993