many skin conditions, including atopic dermatitis, psoriasis, dry skin and even skin ageing.[2] Changes in the relative abundance of different lipids, and reductions in the chain length of ceramides and free fatty acids alter the lamellar organization and packing of the SC lipid matrix, leading to impaired barrier function.[1,3] Therefore, interventions correcting SC lipid abnormalities have the potential to improve epidermal barrier function and the symptoms associated with a number of skin conditions.

Topical application of lipids has shown potential to restore a healthier SC lipid profile,[4,5] and in this issue of the *BJD*, Danby *et al.*[6] report the results of a randomized observer-blinded intrapatient-controlled study examining the effect of topical lipid application on skin affected by atopic dermatitis. In this study, 34 adults with dry eczema-prone skin applied a test cream to the forearm and lower leg on one side of their body, and a reference cream to the forearm and lower leg on the other side of their body, twice per day for 28 days. The test cream contained ceramides, triglycerides and cholesterol, as well as humectants. Following treatment, participants' skin was assessed for skin barrier function [transepidermal water loss (TEWL)], integrity (TEWL during sequential tape stripping), cohesion (protein removal during tape stripping), sensitivity (redness and TEWL in response to a sodium lauryl sulfate challenge), hydration (skin capacitance and visual skin dryness) and SC composition and structure [attenuated total-reflection Fourier transform infrared spectroscopy (ATR-FTIR)]. The test cream led to significant improvements in all clinical measures compared with the reference cream, and exploratory ATR-FTIR revealed changes in lipid content and packing in SC treated with the test cream.[6]

The mechanism by which topical lipids improve the SC lipid profile is not fully understood.[2] The lipids contained in the test cream have previously been shown to penetrate the SC,[7] and there is evidence from *ex vivo* skin that topically applied fatty acids are elongated and directly incorporated into the SC.[8] However, topical lipids may also upregulate keratinocyte lipid synthesis via activation of peroxisome proliferator-activated receptors.[9] Interestingly, the test cream appeared to have a greater effect size in older individuals, although this was not statistically significant possibly due to the sample size. Intrinsically aged skin in otherwise healthy individuals exhibits changes in SC lipids, with associated decline in skin barrier function.[2] Therefore, although this study focused on volunteers with atopic dermatitis, topical application of lipids may also prove beneficial for healthy older individuals. Indeed, an emollient containing plant oils has been shown to improve skin hydration and barrier function in older individuals.[5]

In conclusion, this study provides further evidence that topical application of lipids can help restore the lipid matrix of the SC, leading to improvement of clinical symptoms. The mechanisms of lipid restoration remain unclear, but this is a promising approach for the treatment of numerous inflammatory skin conditions.

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The importance of accurate epidemiological data of epidermolysis bullosa

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Epidermolysis bullosa (EB) is a clinically and genetically heterogeneous group of rare and currently incurable inherited disorders characterized by fragility of the skin and mucous

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membranes. It has a major impact on affected persons, their families and caregivers, and healthcare systems.[1] Reliable epidemiological data, based on well-characterized cohorts, are important for rare diseases like EB.[2] These data provide insight into the need for care and costs in the specific country, make it possible to identify epidemiological trends, and are invaluable for the design and execution of clinical trials and to estimate the number of patients who might benefit from a certain therapy.

In this issue of the *BJD*, Petrof *et al.* describe the EB population of England and Wales and provide epidemiological data from one of the largest EB cohorts reported until now, with over 2500 patients with EB.[3] They report a prevalence of 34·8 and an incidence of 67·8 per million. Former epidemiological studies on EB showed considerably varying figures, partly reflecting the challenge of epidemiological studies of EB, and rare diseases in general. The reported prevalences and incidences (per million) were, respectively, 22·4 and 41·3 in the Netherlands and 11·1 and 19·6 in the USA; prevalences (per million) were 10·3 in Australia, 19·5 in New Zealand, 6·7 in Iran and approximately 20 in Slovenia.[4–9] These varying figures can be explained by factors influencing case ascertainment, like demographic factors (country size, and number and distribution of EB centres) and factors related to healthcare systems (insurance aspects, diagnostic possibilities, awareness among non-EB specialists about the disease, and centres of expertise). In addition, numbers may vary between cohorts because of population differences (founder mutations, consanguinity, cultural and religious beliefs).

The reported incidence and prevalence in England and Wales are higher than those from other countries cited, reflecting a combination of high case ascertainment and likely also population characteristics. A similar finding was reported in the Dutch cohort, indicating that EB appears to be more common than previously thought, which is crucial information with regards to estimations of the number of patients who might benefit from treatment, costs of (potential) therapies, and the design of clinical trials. Petrof *et al.* also provide longitudinal data and show a reduction of birth incidence over the 19-year period for all types of EB, even when corrected for changes in total population and the number of live births over the period.[3] This shows the ability of robust epidemiological data from a cohort with high case ascertainment to be able to identify important trends.

In order to be able to provide the most accurate information on subpopulations of a disease – in the case of EB: EB simplex, junctional EB, dystrophic EB and Kindler EB – it is important that the population is well characterized, not only clinically but also by skin biopsy (blister level, protein expression) and affected gene.[10] The latter is particularly important in the light of future targeted therapies. We therefore would like to encourage upcoming epidemiological EB studies to provide the affected gene distribution of the population as well.

To conclude, well-characterized EB cohorts with comprehensive case ascertainment and longitudinal data, like the England and Wales cohort presented by Petrof *et al.*, are of the utmost importance for estimation of the impact of the disease on healthcare and costs, identification of trends, design and execution of clinical trials, and estimation of the number of patients who might benefit from a certain intervention or therapy.

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