(protocol no. H-15004238) and the Danish Data Protection Agency (GEH-2015-071 I-Suite no. 03641).

Contrary to expectations, tonsillar carriage of *S. pyogenes* was similar among cases and genetically disposed and undisposed controls (0%, 1·8% and 3·3%, respectively; Table 1). Likewise, no significant differences in tonsillar or perineal carriage of *S. agalactiae* or *S. dysgalactiae* were detected, although carriage of these strains was more prevalent among cases. In contrast to analyses of data from microbiological cultures, self-reported tonsillectomy and frequent tonsillitis were more frequently reported among adolescents with psoriasis (11%) than among undisposed controls (2·4%) (Table 1).

Our results suggest that adolescents with psoriasis are not more likely to be carriers of *S. pyogenes* than their peers. Nonetheless, they are more likely to report recurrent tonsillitis, which is in line with our previous findings, but may be due to information bias.[5] Interestingly, the proportion of genetically disposed controls with recurrent tonsillitis was intermediate to that of cases and undisposed controls. The *HLA-Cw*0602* allele may increase the risk of both psoriasis and streptococcal tonsillitis, which may explain this observation.[8]

Lack of streptococcal carriers of *S. pyogenes* among cases of psoriasis runs contrary to our own expectations, and certain explanations may be plausible. The most obvious of these is that cases – as our data suggest – are more likely to undergo a tonsillectomy, thereby reducing the risk of future streptococcal colonization. In this context, a tonsillectomy may be a result of recurrent tonsillitis and may serve as a disease severity modifier. Lastly, *S. pyogenes* is known to create biofilms, leading to negative cultures even in the presence of colonization. Carefully taken samples and microbiome analyses may provide a clearer picture in future studies. Differences between our study and that of Mallbris *et al.*[8] deserve attention, but are likely explained by differences in time from disease onset.

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Quality of life, treatment goals, preferences and satisfaction in older adults with psoriasis: a patient survey comparing age groups

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Dear Editor, Psoriasis management in the rapidly expanding geriatric population can be complex owing to frailty, comorbidities, comedication and limited available data on treating older patients with psoriasis.[1] Previous studies reported comparable disease severity in patients aged ≥ 65 years and patients aged < 65 years,[2–4] although prescribed antipsoriatic therapies differed between age groups.[2,3,5] This might be due to comorbidities and comedication, and/or disease perception or patient preferences.[3,5] Unfortunately, little is known

regarding these topics in older patients with psoriasis. Moreover, it has been suggested that currently available quality-of-life (QoL) assessment tools do not always appropriately reflect true QoL impairment in older adults.[6]

To improve personalized psoriasis management in older adults, this study evaluated the unmet needs in geriatric patients with psoriasis using a nationwide self-administered survey, distributed among all members of the Dutch Psoriasis Association (n = 3310). The methodology of this study was described in a previous publication.[4] The Dermatology Life Quality Index (DLQI), 5-point Likert scales and open-ended questions were used to study disease burden, QoL impact, treatment goals, preferences and satisfaction. To adjust for 'not relevant' responses (NRRs), the DLQI-Relevant (DLQI-R) score was calculated, with a maximum of three NRRs per patient.[7] Patients were categorized into respondents aged ≥ 65 years and those aged < 65 years. A Mann–Whitney U-test was used to compare continuous variables between the age groups and χ^2-test or Fisher's exact test were used for categorical variables. Missing values were not included in the analyses. The Research Ethics Committee of the Radboud University Medical Centre passed a positive judgement on the study before execution of the study had started.

Among the responses suitable for analysis (n = 950; 28·7%), 414 (43·6%) patients were aged ≥ 65 years (mean age 72·4 ± 5·9 years). Disease severity was comparable between the groups.[4] Patients aged ≥ 65 years and those aged < 65 years reported pruritus as the most bothersome aspect of psoriasis [127 (35·0%) vs. 200 (39·8%), P = 0·146], followed by flaking [72 (19·8%) vs. 122 (24·3%), P = 0·120] and visibility [58 (16·0%) vs. 107 (21·3%), P = 0·049]. Although the original DLQI was significantly lower in patients aged ≥ 65 years vs. patients aged < 65 years (mean 2·98 ± 3·5 vs. 3·89 ± 4·55, P = 0·006), the DLQI-R was not significantly different between the groups (mean 3·42 ± 4·00 vs. 4·13 ± 4·76, P = 0·076). At least one NRR was reported by 238 (60·7%) patients aged ≥ 65 years vs. 161 (31·3%) patients aged < 65 years (P < 0·001). The least applicable items according to patients aged ≥ 65 years were item 7 [work, n = 191 (49·2%)] and item 6 [sports, n = 117 (30·3%)].

The most important relevant treatment goals in both age groups were to be free of pruritus [overall mean 4·56, NRR in 39 (4·1%) patients], scaling [overall mean 4·37, NRR in six (0·6%) patients] and visible lesions [overall mean 4·15, NRR in nine (0·9%) patients]. Freedom from

Table 1 An overview of treatment goals, treatment satisfaction and patient preferences in patients with psoriasis aged ≥ 65 years compared with patients aged < 65 years

	< 65 years	≥ 65 years	NRR	P-values[a]
Treatment goals				
To be free of pruritus	4·52 ± 0·7	4·61 ± 0·6	39 (4·1)	0·059
To be free of pain	4·41 ± 0·7	4·47 ± 0·7	181 (19·1)	0·517
To be free of scaling	4·32 ± 0·7	4·43 ± 0·8	6 (0·6)	**0·003**
To be free of sleep disturbances	4·31 ± 0·9	4·39 ± 0·8	371 (39·1)	0·374
To be free of negative impact on daily activities	4·28 ± 0·8	4·23 ± 0·9	192 (20·2)	0·713
To be free of visible lesions	4·09 ± 1·0	4·23 ± 0·9	9 (0·9)	0·050
Complete clearance of psoriasis lesions	4·00 ± 1·0	4·16 ± 0·9	2 (0·2)	**0·009**
To be free of redness	3·94 ± 0·9	4·11 ± 0·9	19 (2·0)	**0·006**
Patient preferences				
Minimize the adverse effects of therapy	4·64 ± 0·5	4·61 ± 0·7	–	0·875
To have confidence in therapy	4·64 ± 0·5	4·57 ± 0·6	–	0·170
To apply/use therapy without help from others	4·56 ± 0·7	4·56 ± 0·7	–	0·891
Minimize the use of topical treatment	3·94 ± 1·1	4·13 ± 1·0	–	**0·004**
No usage of injections/syringes/intravenous treatment	3·74 ± 1·4	4·13 ± 1·2	–	**< 0·001**
Minimize the amount of hospital visits	3·77 ± 1·2	4·04 ± 1·1	–	**< 0·001**
No usage of pills/capsules	3·40 ± 1·4	3·84 ± 1·3	–	**< 0·001**
To apply/use therapy without laboratory assessment	2·89 ± 1·4	3·34 ± 1·4	–	**< 0·001**
Treatment satisfaction				
Ease of current treatment	3·90 ± 1·0	3·96 ± 0·9	–	0·433
Overall treatment satisfaction	3·71 ± 1·0	3·75 ± 1·0	–	0·763
Satisfaction regarding treatment frequency	3·58 ± 1·1	3·69 ± 1·0	–	0·165
Burden of side-effects	2·51 ± 0·9	2·56 ± 0·9	–	0·806

NRR, 'not relevant' response. Treatment goals and patient preferences were measured using a 5-point Likert scale (5 indicating highly important, 1 indicating not important at all). Treatment satisfaction was measured using a 5-point Likert scale (5 indicating highly satisfied, 1 indicating least satisfied). The burden of side-effects was measured using a 5-point Likert scale (5 indicating a high burden, 1 indicating no burden at all). [a]All results were calculated using a Mann–Whitney U-test; means were presented to improve comprehensibility of the outcomes. Data are presented as mean ± SD or n (%).

pain and sleep disturbances were not relevant for 181 (19·1%) and 371 (39·1%) patients, respectively; however, these treatment goals were highly valued by those for whom they were applicable (Table 1). Minimalization of adverse events associated with antipsoriatic therapies was valued as the most important patient preference in both age groups (overall mean 4·63). Patient preferences regarding the reduction of several treatment modalities were valued as significantly more important by patients aged ≥ 65 years vs. those aged < 65 years. These included minimizing the use of topical treatment (mean 4·13 vs. 3·94, $P = 0·004$), injections (mean 4·13 vs. 3·74, $P < 0·001$) and pills or capsules (mean 3·84 vs. 3·40, $P < 0·001$)]. Moreover, minimalization of hospital visits and the absence of laboratory assessments were valued as significantly more important by patients aged ≥ 65 years (Table 1). After Bonferroni correction for multiple comparisons, the main outcomes showed comparable results.

In accordance with previous studies,[6,7] these data show that DLQI responses are affected by age and that older patients more frequently select NRRs. This emphasizes the underestimation of the actual QoL impairment, as NRRs are currently scored as '0', which is equivalent to 'not at all'. Especially in cases where clinical decisions depend on QoL impact (e.g. reimbursement criteria for biological therapies) or studies comparing QoL between age groups, calculation of the DLQI-R should be considered. A possible limitation of this study was that comparisons were not adjusted for possible confounders. Overall treatment goals, bothersome disease aspects and treatment satisfaction were comparable between the age groups, although the heterogeneity in these outcomes (e.g. the varying number of NRRs regarding treatment goals) accentuates the need for individualized management decisions and specific attention relating to individual patient goals and preferences, reaching further than age alone.

It should be taken into account that overall patient preferences in patients aged ≥ 65 years differed from those of patients aged < 65 years, particularly in relation to the reduction of medication use and hospital visits. Dependency on others could be an explanation for this outcome,[4] as functional impairments in this patient group can cause difficulty in reaching certain areas of the body. Therefore, patients aged ≥ 65 years might experience a higher treatment burden when using topical or subcutaneously administrated therapies. Moreover, comorbidities and comedication could contribute to these patient preferences in those aiming to reduce medication use.[8] Therefore, assessment of individual patient characteristics, QoL impact, treatment goals and preferences could facilitate decision making.

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Comparative whole-exome sequencing of an ultra-late recurrent malignant melanoma

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Dear Editor, When malignant melanoma does not recur within 15 years after treatment, the patient's survival and recovery from the high-grade cancer are celebrated. Ultra-late recurrence, defined as recurrence after more than 15 disease-free years, is very rare.[1,2] This phenomenon is not well analysed because obtaining samples with intact DNA for detailed analyses of tumour tissue stored for such a long time has been considered impossible. Here we report a case of malignant melanoma with ultra-late recurrence 41 years after treatment. We performed a comparative genomic analysis of the primary vs. recurrent tumour using whole-exome sequencing.

The patient was a 72-year-old Japanese woman with a subcutaneous tumour measuring 20 mm in diameter on her left elbow that emerged approximately 1 month before consultation. When she was 31 years old (41 years ago), she was diagnosed with malignant melanoma on her left elbow. At that time, she underwent resection with a 5-cm margin and

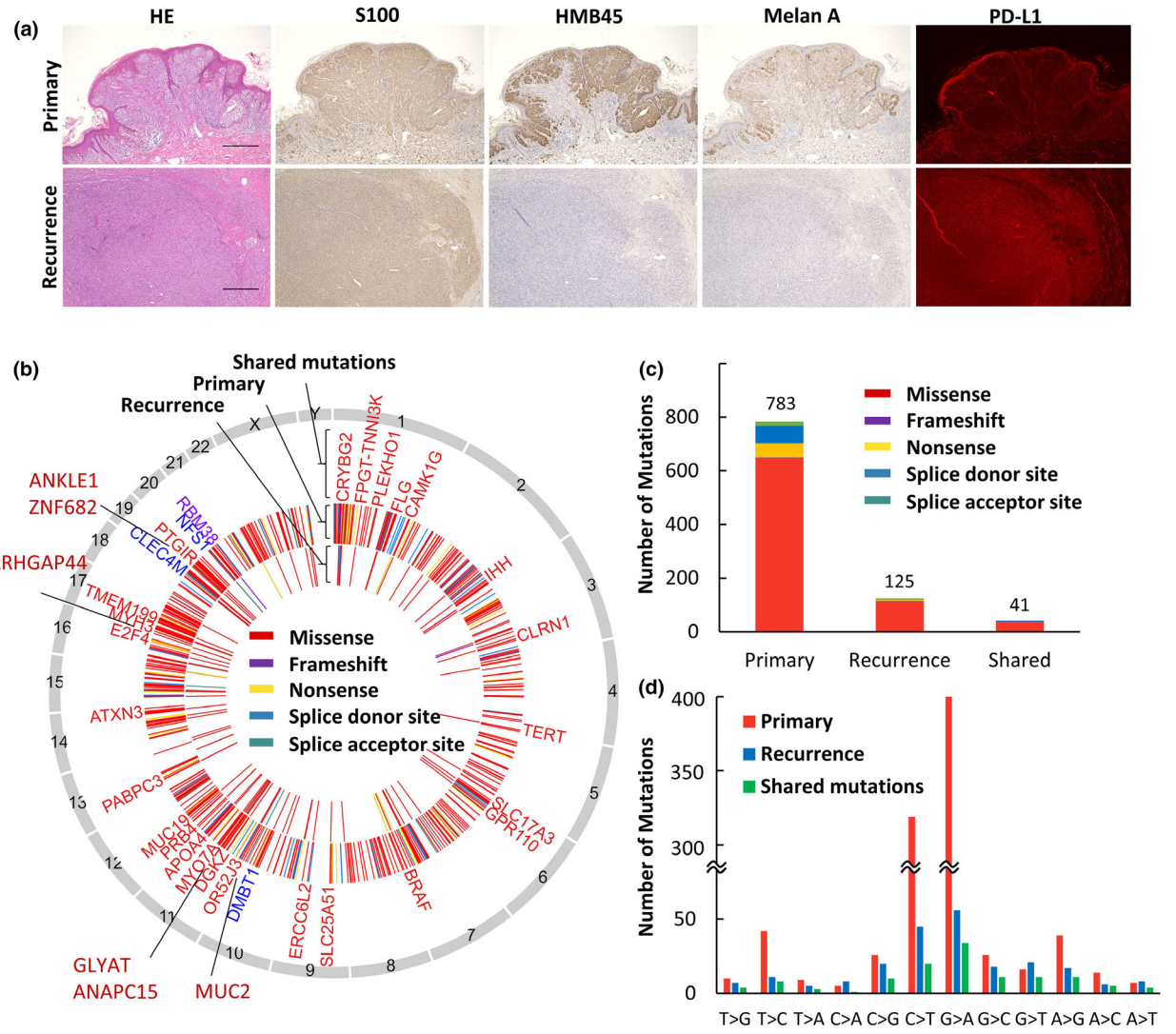

Figure 1 (a) Pathological comparison of the primary and recurrent tumours. HE, haematoxylin and eosin; PD-L1, programmed death ligand 1. (b) Circos plot of the primary and recurrent tumours. The inner track of bars represents mutations in the recurrent tumour and the outer track represents mutations in the primary tumour (read depth ≥ 7). Gene names show mutations shared by primary and recurrent tumours with a frequency ≤ 0·05 in the blood and > 0·10 in the tumours. Colours indicate the mutation type. (c) The number of mutations in each tumour. (d) The number of mutations by type.