

Effects of new keratinocyte carcinomas on skin-related quality of life: Results from the Veterans Affairs Keratinocyte Carcinoma Chemoprevention Trial



To the Editor: Because keratinocyte carcinomas (KCs) affect so many people but have a low mortality rate, we investigate their impact on quality of life (QoL).¹ A previous longitudinal study of a high-risk population found minimal effects of new KCs on skin-related QoL.² We prospectively analyzed the effect of new KCs to determine if they worsen subsequent skin-related QoL.

We used data from the Veterans Affairs Keratinocyte Carcinoma Chemoprevention Trial (NCT00847912), which followed 932 veterans with multiple KCs treated with topical fluorouracil cream, 5%, or vehicle control for a median of 2.8 years.³ This research was approved by the Veterans Affairs Central Institutional Review Board; Declaration of Helsinki protocols were followed, and patients gave written, informed consent.

Skindex-29, Skin Cancer Index (SCI), and the Skindex KC-specific subscale were used to measure skin-related QoL at baseline and at 1, 2, and 3 years.⁴ Subscale scores were calculated by averaging individual item scores, and total scores of each survey were calculated by averaging the 3 subscales. We performed analyses by using Stata statistical software (release 8.0, StataCorp, College Station, TX). Paired *t* tests we used to compare participants' skin-related QoL scores at a given time to their own scores 1 year earlier. Unpaired *t* tests were used to compare the change in skin-related QoL from baseline to year 1 between those with and without new KCs. For year 2 and 3 analyses, multivariable linear regressions accounted for the effect of skin-related QoL and KCs in previous years. All *P* values are 2-tailed.

Of 932 participants, 815 and 817 completed the Skindex and SCI surveys, respectively, at baseline and year 1. Of those who completed Skindex surveys, 288 developed at least 1 new KC in year 1, 265 in year 2, and 116 in year 3. Development of new KCs was associated with worse skin-related QoL on several subscales in all 3 years (Tables I and II). Separate analyses of treatment and control groups yielded significant results mostly in the treatment group; however, the interaction term between treatment group and new KC on change in QoL was not statistically significant. 5-fluorouracil use was shown to have no sustained effect on skin-related QoL at 1, 2, or 3 years.⁵

Table I. Skindex-29, Skindex KC-specific subscale, and SCI QoL scores in participants with and without development of new KCs from baseline to 1 year

Scale and subscale	Score in patients with no new KCs, n = 527			Score in patients with new KCs, n = 288			P value	Difference in change of QoL score between those with new and no new KC	P value	Difference in change in QoL score between interaction variable	P value
	Baseline	1 yr	Direction of QoL score change (difference with time)	Baseline	1 yr	Direction of QoL score change (difference with time)					
Skindex domain											
Emotions	13.81	12.01	Better (−1.80)	13.32	14.24	Worse (0.92)	.010	−2.7	.010	2.91	.171
Symptoms	19.11	17.85	Better (−1.26)	18.94	19.33	Worse (0.38)	.181	−1.64	.181	3.97	.106
Function	6.85	6.00	Better (−0.85)	6.60	7.60	Worse (0.99)	.037	−1.84	.037	3.24	.067
KC-specific	17.60	13.73	Better (−3.87)	17.22	15.67	Better (−1.55)	.061	−2.32	.061	2.34	.346
Total	13.26	11.95	Better (−1.30)	12.96	13.72	Worse (0.77)	.028	−2.07	.028	3.37	.073
USCI domain											
Emotions	69.80	75.54	Better (5.74)	72.76	72.56	Worse (−0.20)	.001	5.94	.001	−2.66	.466
Social	86.05	90.31	Better (4.26)	88.25	86.00	Worse (−2.26)	<.001	6.51	<.001	−2.00	.556
Appearance	81.56	85.69	Better (4.13)	82.52	82.28	Worse (−0.23)	.024	4.36	.024	−3.10	.423
Total	79.14	83.85	Better (4.71)	81.18	80.28	Worse (−0.90)	<.001	5.61	<.001	−2.59	.433

KC, Keratinocyte carcinoma; QoL, quality of life; SCI, Skin Cancer Index.

Table II. Multivariable analyses of skin-related QoL scores at 2 years predicted by the development of new KCs from 1 to 2 years

Scale and category	Subscale regression coefficient (<i>P</i> value) at 2 years				Total at 2 years
	Emotion	Symptom	Function	KC-specific subscale	
Skindex-29 and Skindex KC-specific subscale					
New KC in 0–1-year period	NS	NS	NS	NS	NS
New KC in 1–2-year period	2.11 (.033)	NS	NS	3.68 (<.001)	NS
Baseline QoL	0.39 (<.001)	0.37 (<.001)	0.44 (<.001)	0.33 (<.001)	0.42 (<.001)
1-year QoL	0.45 (<.001)	0.45 (<.001)	0.35 (<.001)	0.46 (<.001)	0.44 (<.001)
Skin Cancer Index					
	Emotion	Social	Appearance		
New KC in 0–1-year period	−3.29 (.041)	NS	NS		NS
New KC in 1–2-year period	NS	NS	NS		NS
Baseline QoL	0.22 (<.001)	0.17 (<.001)	0.19 (<.001)		0.18 (<.001)
1-year QoL	0.38 (<.001)	0.21 (<.001)	0.29 (<.001)		0.30 (<.001)

KC, Keratinocyte carcinoma; QoL, quality of life; NS, not significant ($P > .05$).

Our ability to detect a relationship between skin-related QoL and KCs in longitudinal analyses but not with baseline cross-sectional analyses might indicate the importance of the more precise control of potential confounders that is inherent in comparing each individual to their own prior state.

A strength of this study was our ability to detect change in skin-related QoL by examining the same individuals at different points in time, enabling better control of potential unmeasured confounding factors. Generalizability of findings is limited by the homogenous study population. We cannot confirm the order of events that occurred at the same visit: when surveys were administered and when biopsies were taken. In analyses, we did not account for treatment of KCs during the study.

Our findings of impaired skin-related QoL associated with KCs underscores the importance of appropriate preventative and therapeutic measures; development of new KCs is related to a patient's QoL.

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