Epidermal growth factor receptor inhibitors (EGFRIs) are an increasingly important class of anticancer agents. Cutaneous toxicities, the most common adverse effects of EGFRi therapy, require dose modification or treatment cessation when moderate or severe and may compromise treatment compliance. To date, assessment has focused on physical symptoms associated with cutaneous toxicities; however, the psychosocial impact of those effects requires greater consideration. This article reviews current knowledge of assessment of cutaneous toxicities and identifies gaps in evidence, with particular focus on the psychosocial impact of cutaneous toxicities. Promising new assessment tools and approaches including the use of electronic patient-reported outcome measures are discussed, as well as implications for research in evaluating psychosocial interventions.

**At a Glance**

- Epidermal growth factor receptor inhibitors have a favorable toxicity profile, but associated cutaneous effects can compromise compliance to treatment and reduce quality of life.
- The prevalence and severity of the psychosocial impact of cutaneous toxicities have not been reported comprehensively.
- Patient-reported outcome measures can play a greater role in the assessment of cutaneous toxicities and their psychosocial impact, but they require further testing and validation.

Although EGFRIs have a more acceptable toxicity profile compared to other anticancer therapies (e.g., chemotherapy), adverse treatment effects unique to EGFRIs have been identified. The toxicities primarily are cutaneous, particularly papulopustular eruption, and have been described as “acneform” (Segaert...
Severity Assessment

Statements regarding prevalence and severity must be interpreted with caution because reporting practices vary widely throughout the literature (Eaby, Culkin, & Lacouture, 2008). A 2008 literature review by Bauer, Hammerman, Rapoport, and Lacouture found that monoclonal-antibody side-effect reporting was incomplete and inconsistent, particularly with respect to assessment methods and severity grading. Considerable interest also exists in incorporating more objective severity measures, such as photographic assessment. For example, Scope et al. (2007, 2009) used a combination of lesion counts, blinded photographic review, and patient-reported severity in clinical trials of toxicity treatment. Because of concerns about bias from subjective patient self-report of severity and investigator assessment of severity lesion counting, Scope et al. (2009) noted that the use of blinded photographic review provided an objective way of examining rash severity. In addition, Saif et al. (2010) found that patients sending photos electronically assisted in the diagnosis and management of cutaneous toxicities. Such approaches may improve the assessment and documentation of toxicity severity.

In clinical trials, the National Cancer Institute Cancer Therapy Evaluation Program’s (NCI-CTEP’s) Common Terminology Criteria for Adverse Events (CTCAE) scale has been the primary method for assessing the severity of cutaneous side effects of EGFRIs (Bauer et al., 2008). At the time of version 2.0, the CTCAE was known as the Common Toxicity Criteria; however, for ease of understanding, all versions are referred to as the CTCAE throughout this article. Version 2.0 (NCI-CTEP, 1999) was used in clinical trials prior to 2006, and version 3.0 (NCI-CTEP, 2006) generally has been used since (Saif, Merikas, Tsimboukis, & Syrigos, 2008). However, the limitations of version 2.0 for categorizing the toxicities are well described and, although version 3.0 introduced some improved modifications with a separate grading scale for acne and acneform rash (Duvic, 2008), concerns remain over the applicability of the tool for comprehensive assessment of cutaneous toxicities (Duvic, 2008; Esper, Gale, & Muehlbauer, 2007). CTCAE, version 4.0, includes additional modifications that are discussed later in this article.

Of particular concern is that rash visibility can cause significant patient distress, even if the rash is not classified as severe using the CTCAE (Duvic, 2008; Morse & Calaresu, 2006). In one case report, a patient with lung cancer stopped erlotinib because of its aesthetic impact (Journagan & Obadiah, 2006); other clinicians also have expressed concern that the effect of the toxicities on appearance can affect patient compliance with EGFRi therapy (Segaert & Van Cutsem, 2007; Tsimboukis, Merikas, Karapanagiotou, Saif, & Syrigos, 2009).

In recognition of the problems with using the CTCAE as an assessment tool for cutaneous toxicities, the MASCC Skin Toxicity Group developed the MASCC EGFRi Dermatologic Adverse Event Scale for grading EGFRi-associated cutaneous adverse events (Lacouture, Maitland, et al., 2010). The scale, which includes 17 toxicities, is consistent with the Medical Dictionary for Regulatory Activities terminology and the CTCAE (Lacouture, Maitland, et al., 2010). Of note, the MASCC scale also incorporates patient-reported health-related quality-of-life (QOL) outcomes, enabling assessment of the physical as well as psychosocial impact of cutaneous toxicities (Lacouture, Maitland, et al., 2010). The development of the MASCC scale was a significant step in providing a comprehensive assessment tool;
however, the scale requires formal validation and reliability testing in a range of clinical research settings to fully evaluate its optimal use.

**Role of Patient-Reported Outcome Measures**

Although the CTCAE is used primarily by clinicians in the rating and measurement of symptom burden, patient-reported outcomes (PROs) and PRO measures (PROMs) also are important and are incorporated routinely into the design of clinical research protocols (Bruner, 2007). Comprehensive clinical assessment of cutaneous toxicities using valid and reliable tools is essential; however, patient reports of symptom severity could provide vital additional information to clinicians on the management of overall symptom burden. Therefore, the role of PROMs on symptoms requires further study and evaluation.

A key aspect of the U.S. Food and Drug Administration's (FDA's) definition of PROs is that the responses come from the patient instead of being filtered through other parties and, therefore, being affected by their interpretation (FDA, 2009). The use of PROs in cancer to date have played a role in determining (a) health-related QOL and (b) the type, extent, and burden of symptoms as experienced by patients. A PRO instrument can be used to measure the impact of an intervention on one or more aspects of patients' health status in relation to symptoms (e.g., headaches) to more global assessments (e.g., ability to perform activities of daily living) (Sloan et al., 2007). Carefully selected PRO measurement tools have the capacity to address important questions on the optimal management of patients with cancer to provide guidance on clinical decision making in supportive care and treatment. However, such tools should be validated, should sufficiently reflect the patients' condition and outcomes of interest, and should be designed to ensure a high rate of completion (Sloan et al., 2007).

Integrating clinician rating (e.g., via the CTCAE with the use of PROMs) can provide important additional information on symptom burden from patients' perspectives, but also may predict more accurately the time to onset and severity of symptoms, thus triggering early clinical decision making on treatment dose modification as well as the introduction of appropriate interventions to reduce symptom burden. The interdisciplinary research team who developed the MASCC EGFRI Dermatologic Adverse Event Scale also identified the integration of clinician ratings and PROs as a key objective of a new grading scale because clinicians only observe a snapshot of the true time course of cutaneous toxicities and not necessarily from the patients' perspectives (Lacouture, Maitland, et al., 2010). NCI also is developing a CTCAE-PRO electronic patient symptom tracking and reporting tool (Sloan et al., 2007). This tool has been found to be feasible, even among patients with advanced cancer and high symptom burden (Basch et al., 2007).

The Patient-Reported Outcomes Measurement Information System (PROMIS) is a major initiative with the potential to expand and improve the use of PROs in clinical research. PROMIS seeks to address barriers to PRO use such as variation in measurement, responsiveness, response burden, and validity (Garcia et al., 2007). PROMIS will include specific cancer domains (Garcia et al., 2007), making it useful for cancer researchers. Initial PROMIS item banks are undergoing clinical validation testing in multiple populations, including patients with cancer (Cella et al., 2010).

**Assessing Psychosocial Impact**

Another major consideration is the comprehensive assessment of psychosocial issues, a particularly important factor in light of reported associations between skin disorders and negative outcomes such as anxiety, depression, distress, and body image problems (Barankin & DeKoven, 2002). Barankin and DeKoven (2002) emphasized that skin disorders necessitate looking beyond clinical symptom burden. The significance of these toxicities for patients have been recognized in terms of physical appearance (Dunsford, 2008). Robert et al. (2005) noted that skin disorders may be more problematic for patients than other more painful effects. A qualitative study of the symptom burden and health-related QOL effects of EGFRIIs by Wagner and Lacouture (2007) revealed that although physical discomfort was the key factor affecting QOL, the impact on social function was significant. Importantly, patients felt that the visibility of the rash caused them to reveal their cancer diagnosis (Wagner & Lacouture, 2007). Although this was upsetting to patients, further distress was caused by concern about how others would react to such a diagnosis. As a result, patients decreased their social involvement; the toxicities also reportedly inhibited demonstrations of affection (Wagner & Lacouture, 2007).

CTCAE, version 4.0, has incorporated some measurement of psychosocial issues; for example, a grade 2 (of a maximum of 5) rash has psychosocial impact and limits instrumental activities of daily living (e.g., preparing meals, shopping), whereas a grade 3 rash affects the ability to care for oneself (e.g., eat, bathe) (NCI-CTEP, 2010). However, relative body surface area coverage by rash still is used in differentiating between grades 1–3, and psychosocial impact is a broad classification that may not be specific enough to capture the full impact of the toxicities. Several studies have assessed the psychosocial impact of the toxicities or the psychosocial effects of managing the toxicities (e.g., with emollient creams or other treatment). Because studies exploring the effect of toxicity management are new and many still are recruiting participants, data in this area are limited. Based on the findings of the small number of completed studies, toxicity treatment appears to improve QOL compared to no treatment or placebo.

In relation to the psychosocial impact of cutaneous toxicities, results are mixed and the variety of instruments used makes direct comparison difficult. Most studies found a decrease in QOL, but two studies (Au et al., 2005; Romito et al., 2010) identified an increase in QOL. In Au et al.’s (2005) study, a trend suggested that patients with worse rash had better global QOL scores. The finding seems to support Romito et al.’s (2010) explanation for their positive QOL findings; they argued that increased focus on the benefits of new cancer treatments may help patients contextualize the cutaneous effects, particularly because the effects indicate treatment efficacy (Romito et al., 2010). Given the aforementioned correlation between rash and clinical response to treatment, QOL
Table 1. Assessment Tools for the Psychosocial Effects of EGFRI-Related Cutaneous Toxicities

<table>
<thead>
<tr>
<th>STUDY</th>
<th>TOOL</th>
<th>DESCRIPTION</th>
<th>PURPOSE</th>
<th>N</th>
<th>PSYCHOSOCIAL OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andreis et al., 2010</td>
<td>Skindex-29</td>
<td>Validated 29-question tool for patients with dermatologic conditions</td>
<td>QOL assessment in patients with colon cancer with at least grade 2 skin toxicities</td>
<td>45</td>
<td>Greatest effects were seen on the symptom domain, then emotional and functioning. Worst QOL was observed in women, older patients (aged 55–65 years), and those in partial remission.</td>
</tr>
<tr>
<td>Au et al., 2005</td>
<td>EORTC QLQ-C30</td>
<td>Validated instrument for measuring QOL in patients with cancer</td>
<td>QOL assessment comparing patients receiving gemcitabine versus patients receiving gemcitabine plus erlotinib Assessed for clinically relevant change in QOL of at least 10 points from baseline. Categorized changes in QOL as improved, stable, or worse by rash development and severity.</td>
<td>285 (estimated)</td>
<td>Global QOL percentage improved in rash group versus no-rash group. Improved QOL percentage was similar between groups for social and emotional QOL.</td>
</tr>
<tr>
<td>Jatoi et al., 2008</td>
<td>Skindex-16</td>
<td>Validated 16-question tool for patients with dermatologic conditions</td>
<td>Assessed QOL in patients receiving either tetracycline or placebo treatment for EGFRI toxicity.</td>
<td>61</td>
<td>Tetracycline treatment for rash improved QOL for 4 of 16 questions. No difference between groups (tetracycline versus placebo) occurred for 11 questions. Worse QOL for tetracycline occurred for one question.</td>
</tr>
<tr>
<td>Joshi et al., 2009</td>
<td>Skindex-16</td>
<td>Validated 16-question tool for patients with dermatologic conditions</td>
<td>Comparison of QOL scores for patients with papulo-pustular rash grade 1–3 against scores for patients with eczematous dermatitis and acne vulgaris</td>
<td>55</td>
<td>EGFRI-associated toxicities had greater effect across all domains (symptoms, emotions, and functioning) compared to eczematous dermatitis and acne vulgaris.</td>
</tr>
<tr>
<td>Lacouture, 2010</td>
<td>Skindex-16</td>
<td>Validated 16-question tool for patients with dermatologic conditions</td>
<td>Compared Skindex-16 with CTCAE response to four creams (urea 40%, fluocinonide 0.05%, tazarotene 0.1%, and Udderly Smooth®[Redex Industries]) for EGFRI-toxicity treatment.</td>
<td>120 (estimated)</td>
<td>Study is ongoing to date.</td>
</tr>
<tr>
<td>Lacouture, Maitland, et al., 2010</td>
<td>MASCC EGFRI Dermatologic Adverse Event Scale</td>
<td>Tool including 17 EGFRI-associated toxicities</td>
<td>Comprehensive assessment of dermatologic side effects associated with EGFRI</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Lacouture, Mitchell, et al., 2010</td>
<td>DLQI</td>
<td>Valid, reliable measure for dermatology-specific QOL</td>
<td>Compared QOL for reactive and proactive treatment of EGFRI skin toxicities.</td>
<td>95</td>
<td>Prophylactic group had a better mean change in DLQI score from baseline (1.3 for prophylactic group versus 4.2 for reactive group at three weeks).</td>
</tr>
<tr>
<td>Melosky, 2010</td>
<td>DLQI</td>
<td>Valid, reliable measure for dermatology-specific QOL</td>
<td>Assessed distress related to rash.</td>
<td>150 (estimated)</td>
<td>Study is ongoing to date.</td>
</tr>
</tbody>
</table>
| Meriggi et al., 2008         | Skindex-29         | Validated 29-question tool for patients with dermatologic conditions | Evaluated the performance of Skindex-29 for assessing health-related QOL during EGFRI treatment. | 25; only 21 were evaluable (reason not stated). | Worse health-related QOL versus published scale scores were reported for healthy volunteers on emotions, symptoms, and functioning. (Continued on next page)

CTCAE—Common Terminology Criteria for Adverse Events; DLQI—Dermatology Life Quality Index; EGFRI—epidermal growth factor receptor inhibitor; EORTC—European Organisation for Research and Treatment of Cancer; EQ-VAS—European Quality of Life Visual Analog Scale; FACT—Functional Assessment of Cancer Therapy; FAST—Functional Assessment of Side-Effects to Therapy; MASCC—Multinational Association of Supportive Care in Cancer; PDI—Psychological Distress Inventory; QLQ-C30—Quality of Life Questionnaire–Core 30; QOL—quality of life.
Table 1. Assessment Tools for the Psychosocial Effects of EGFRI-Related Cutaneous Toxicities (Continued)

<table>
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<tr>
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<th>PURPOSE</th>
<th>N</th>
<th>PSYCHOSOCIAL OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molinari et al., 2005</td>
<td>Not stated</td>
<td>Clinician asked whether rash affected global QOL (rated as significant, moderate, or no consequence).</td>
<td>Assessment of effect of rash on global QOL</td>
<td>13 (only 11 had acne eruptions)</td>
<td>The majority of patients said QOL change was significant; most of the remainder felt QOL was moderate.</td>
</tr>
<tr>
<td>Osio et al., 2009</td>
<td>DLQI</td>
<td>Valid, reliable measure for dermatology-specific QOL</td>
<td>Assessment of effect of cutaneous symptoms on QOL in patients treated with EGFRIs for at least six months (interested in long-term effect)</td>
<td>15</td>
<td>A moderate to strong QOL effect was found in 4 patients.</td>
</tr>
<tr>
<td>Peeters et al., 2009</td>
<td>Modified DLQI, EQ-VAS, and EORTC QLQ-C30</td>
<td>Modified DLQI: valid, reliable measure for dermatology-specific QOL EQ-VAS: self-rating of health-related QOL EORTC QLQ-C30: validated instrument for measuring QOL in patients with cancer</td>
<td>Assessment of skin problems and health-related QOL and association of skin toxicity with effect of panitumumab on metastatic colorectal cancer</td>
<td>463</td>
<td>A negative association was found between modified DLQI score and health-related QOL, overall survival, and progression-free survival.</td>
</tr>
<tr>
<td>Romito et al., 2010</td>
<td>FACT-Colorectal, PDI, and social avoidance</td>
<td>FACT-Colorectal: 27 items from the FACT-General plus a disease-specific subscale; covers physical, social, emotional, and functional domains; 5-point Likert scale (not at all to very much) PDI: 13 items; reliable; assesses psychological distress; 5-point Likert scale (not at all to very much) Social avoidance: 1 item; not validated; 3-point Likert scale (anchors not stated)</td>
<td>Assessed the psychological and social impact of EGFRI skin rash.</td>
<td>80</td>
<td>The majority of patients (55%) did not have psychological distress. Most (53%) did not avoid socializing because of toxicity. A correlation among QOL, psychological distress, and social avoidance was found.</td>
</tr>
<tr>
<td>Wagner et al., 2007</td>
<td>FAST-EGFRI</td>
<td>Tool includes information from Skindex-29. Patient and clinician ratings were used to develop the FAST-EGFRI. Ratings were 0 (not at all important) to 3 (extremely important) related to health-related QOL Validation studies are in process to date.</td>
<td>Assessed a patient-reported questionnaire about most bothersome aspects of EGFRI skin toxicities and the effect of those aspects on health-related QOL.</td>
<td>32 (20 patients and 12 expert clinicians)</td>
<td>Physical discomfort (e.g., burning, pain) and psychosocial issues (e.g., depression) affected health-related QOL.</td>
</tr>
<tr>
<td>Wagner &amp; Lacouture, 2007</td>
<td>Skindex</td>
<td>Qualitative interviews and patient and expert ratings regarding 62 items from Skindex in terms of importance to health-related QOL</td>
<td>Identified the effect of EGFRI skin toxicities on health-related QOL.</td>
<td>32 (20 patients and 12 expert clinicians)</td>
<td>Physical discomfort was an important factor affecting health-related QOL; toxicity and visibility were problematic; social functioning and social relationships were affected.</td>
</tr>
<tr>
<td>Wither-spoon et al., 2008</td>
<td>Skindex-16</td>
<td>Validated 16-question tool for patients with dermatologic conditions</td>
<td>Assessed factors associated with QOL scores as measured by Skindex</td>
<td>58</td>
<td>Emotional domain was more affected versus symptoms or functional. Correlation was found between CTCAE grade and Skindex QOL.</td>
</tr>
</tbody>
</table>

CTCAE—Common Terminology Criteria for Adverse Events; DLQI—Dermatology Life Quality Index; EGFRI—epidermal growth factor receptor inhibitor; EORTC—European Organisation for Research and Treatment of Cancer; EQ-VAS—European Quality of Life Visual Analog Scale; FACT—Functional Assessment of Cancer Therapy; FAST—Functional Assessment of Side-Effects to Therapy; MASCC—Multinational Association of Supportive Care in Cancer; PDI—Psychological Distress Inventory; QLQ-C30—Quality of Life Questionnaire—Core 30; QOL—quality of life
may increase because of an improvement in signs and symptoms. In a study by Molinari, De Quatrebarbes, Andre, and Aractingi (2005), almost half of the participants reported QOL change as moderate (as opposed to significant or of no consequence); however, no explanation was given for this finding.

The impact on social functioning also is difficult to determine because results are complicated by the use of different instruments. The visibility of cutaneous toxicities and physical discomfort appears to be the primary concerns to patients, leading to reports of lower QOL. However, whether the emotional domain is more affected compared to other domains is unclear because the findings are inconsistent across studies.

Table 1 demonstrates that the number of participants varied from study to study, again negating direct comparison, although the treatment intervention trials had similar sample sizes. Data in the table were compiled from searches in 2009 and 2010 of the U.S. National Institutes of Health clinical trial registry (http://clinicaltrials.gov), PubMed, Embase®, and Google™ Scholar using the terms psychosocial, quality of life, skin toxicity, cutaneous toxicity, epidermal growth factor receptor inhibitor, and EGFR. The bibliographies of articles relating to cutaneous toxicities were hand-searched.

The Skindex questionnaires have been used by several researchers investigating the psychosocial effects of EGFRIs. Skindex, originally developed in the United States, is a dermatology-specific QOL measure that uses eight constructs (cognitive, social, depression, fear, embarrassment, anger, physical discomfort, and physical limitations) to assess the effect of skin diseases on QOL (Chren, Lasek, Quinn, Mostow, & Zyzanski, 1996). Skindex is a patient-reported measure that has been validated in several populations and languages (Both, Essink-Bot, Busschbach, & Nijsten, 2007). The original version of Skindex had a high level of internal reliability, with Cronbach alpha coefficients of 0.76–0.86 and Pearson test-retest correlation coefficients of 0.68–0.9 for the eight scales (0.7 is considered acceptable for both measures) (Domino & Domino, 2006; Nunnally, 1978). Construct validity was demonstrated through exploratory factor analysis, which extracted seven factors that explained a high proportion (78%) of the variance. A comparison of patients with two different types of skin diseases also showed construct validity because patients with inflammatory dermatoses (p ≤ 0.05) had significantly higher scores on seven scales compared to patients with isolated lesions. Responsiveness to clinical change also was demonstrated (Chren et al., 1996). An adaptation of Skindex-29 into Spanish also was found to be valid and reliable (Jones-Caballero, Pena, Garcia-Diez, Badia, & Chren, 2000).

Both et al. (2007) reviewed dermatology-specific and generic health-related QOL instruments used previously in dermatologic studies and recommended using a combination of the SF-36 and Skindex-29. The original version of Skindex has 61 items, but the tool has been reduced to 29 items (i.e., Skindex-29) (Nijsten, Sampogna, Chren, & Abeni, 2006). A further reduction from Skindex-29 to Skindex-17 performed well with good face validity when tested in an otherwise healthy population of Italian women with skin diseases such as acne and psoriasis (Nijsten et al., 2006). Another variation, Skindex-16, was tested in the United States and demonstrated good reliability (Cronbach alpha = 0.86–0.95), reproducibility (Pearson r = 0.88–0.9), responsiveness, and construct and content validity. Construct validity was assessed using clinical comparisons as described previously and exploratory factor analysis using principal axis factoring with oblique rotation. Content validity was assessed by comparing constructs underlying Skindex items to patient responses to open-ended questions. In addition to being shorter, Skindex-16 focuses more on the effect, rather than frequency, of skin problems (Chren, Lasek, Sahay, & Sands, 2001). However, concerns exist about the structure of Skindex-29 (and therefore, the briefer Skindex-16 and Skindex-17) because of its failure to fit a Rasch model and lack of clear documentation regarding the meaning of scores (Both et al., 2007).

Another dermatology-specific QOL measure is the Dermatology Life Quality Index (DLQI), or a modified version (mDLQI), originally developed in the United Kingdom. The DLQI has been assessed in a range of settings and countries and for different skin diseases, including vitiligo, psoriasis, and acne (Basra, Fenech, Gatt, Salek, & Finlay, 2008). Exploratory factor analyses have given two to four factor solutions; the variability may be a result of use in different populations (hospital and community) as well as different factor analytic methods (principal components analysis versus other factor analysis). Internal consistency is good, as evidenced by Cronbach alpha = 0.75–0.99 in different studies. Test-retest reliability also is good (Pearson r = 0.91–0.96). Responsiveness to change also has been demonstrated, as has construct validity (comparison of patient and control populations and factor analysis), convergent validity (correlation with other QOL measures), and content validity (patient interviews) (Basra et al., 2008). Both et al. (2007) noted that the DLQI has the advantage of being completed within a short time period. However, prior studies suggested that the DLQI may not sufficiently capture emotional aspects that raise questions about its applicability to skin diseases with large psychological effects (Both et al., 2007). Given the emotional effect of EGFRI toxicities (notwithstanding the inconsistent results as to whether the emotional domain is most strongly affected), whether the DLQI will accurately or completely measure QOL for patients experiencing those toxicities is unclear.

The Functional Assessment of Side-Effects to Therapy-EGFR is specific to skin toxicities and includes items from Skindex-29 (Wagner et al., 2007). However, commenting on the suitability of the questionnaire for psychosocial assessment is premature because validation studies are ongoing to date. Another tool is the Memorial Symptom Assessment Scale (MSAS), an instrument developed for the evaluation of symptom prevalence, characteristics, and distress that lists 52 symptoms and includes questions on skin and body image or appearance (Portenoy et al., 1994). An abbreviated version of the MSAS, the MSAS-Short Form, has been shown to be a valid and easy-to-use instrument for patients with metastatic disease (Chang, Hwang, Feuerman, Kasimis, & Thaler, 2000).

Implications for Research and Practice

Using an appropriate psychosocial assessment tool is critical to developing patient information (Oishi, 2008), a vital aspect of supportive care. Anderson et al. (2009) reviewed the literature on hand-foot skin reaction prevention and treatment and found a lack of studies on patient education. In addition, the focus of the literature in relation to EGFRI-related toxicities has
been on rash as the most common toxicity, but little information exists on how to manage other toxicities caused by those agents (Lacouture & Melosky, 2007). To date, limited research has specifically evaluated nursing interventions for cutaneous toxicities associated with EGFRIs (Oishi, 2008), with an absence of focus on interventions to address psychological needs. The lack of research is problematic given the need for managing the psychosocial effects of skin toxicities. As Saif et al. (2008) noted in regard to erlotinib treatment of patients with metastatic pancreatic cancer, QOL must be emphasized.

In general, the literature on treatment for cutaneous toxicities has focused primarily on physical symptom management (Perez-Soler & Van Cutsem, 2007), such as using emollients for rash (Iacovelli, 2007). Critical gaps remain in knowledge and recommendations for addressing patient information needs and psychosocial issues. Although patient education has been mentioned as an important area (Kurtin, 2007; Purdom & Ohnata, 2007), a significant gap exists in the development of a comprehensive patient information and education framework on skin toxicities. The gap was further highlighted by a survey of cancer survivors that found cutaneous toxicities usually were unexpected prior to treatment and were a source of concern (Gandhi, Oishi, Zubal, & Lacouture, 2009). Therefore, research in the area of psychosocial assessment for cutaneous toxicities associated with EGFRIs is important to ensure accurate assessment and the development of appropriate patient education.

Conclusion

In consideration of the sparse literature assessing the psychosocial effects of EGFRi skin toxicities and the importance of those issues, treatment and patient information to date is not sufficiently comprehensive. Similarly, nonmeasurement of the psychosocial effects can lead to an underestimation of the overall symptom burden from patients’ perspectives. An urgent need exists to improve assessment and measure clinical symptoms more accurately. For example, a combination of using the CTCAE, a validated MASCC EGFRi Dermatologic Adverse Event Scale, and PROMs could be used to accurately and comprehensively assess the psychosocial effect of skin toxicities. The approach will enable the development of nursing interventions to specifically address the physical and psychosocial needs of patients undergoing EGFRi treatment.

The assessments discussed in this article could form the basis for appropriately tailored patient information and lead to further development of the evidence base in EGFRi treatment. Therefore, research should be undertaken via a multifactorial approach involving clinicians as well as patients in assessing the extent of symptom burden to enable nurses to begin developing appropriate patient management and support strategies.

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References


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