Patient Education Materials in Dermatology: Addressing the Health Literacy Needs of Patients

With the increasing availability of digital educational resources and the growing number of media users, the Internet has become an invaluable resource for the dissemination of health care information to the general public. Seventy percent of American adults who use the Internet to obtain health information have reported that it influenced their decision about how to treat an illness or condition. Medical practitioners have the responsibility to develop and distribute materials that are readable and comprehensible to patients across different communities. The mean reading ability of US adults is at the 8th-grade level, and thus the American Medical Association and US National Institutes of Health recommend presenting patient education materials at a reading level between the 3rd and 7th grade. Herein, we assess the readability of more than 700 online dermatologic patient education resources published by a range of dermatologic organizations, and we use 10 widely accepted readability algorithms to determine whether these materials meet the national guidelines. This is a comprehensive analysis of publicly available Internet-based dermatology information using multiple readability assessments. We hope to build on prior research that compared the readability of selected dermatologic patient education materials from the American Academy of Dermatology and other common sources of patient education material (including WebMD.com and Wikipedia.org).

Methods | Institutional review board approval was not required because all data were publicly available online for this study. In January and February 2016, a total of 706 dermatology-related internet-based patient education materials were downloaded from 20 professional websites (Table 1). These articles were reformatted to plain text using word processing software (Microsoft Corp), and any text unrelated to patient education, including figure legends and web page navigation text, was removed. The final edited articles were assessed for their level of readability using Readability Studio (Oleander Software, Ltd), which employs 10 quantitative readability scales that are widely used and accepted in the medical literature (Table I).

Results | The Readability Studio composite of the 9 readability assessments found that the 706 dermatology patient-oriented education materials were written at a mean 12th grade reading level (mean [SD], 12.1 [2.1]; range, 8.9-14.3). Specifically, 691 (98%) articles were written above the recommended 7th grade level. The Flesch reading ease scale, a common readability scale used in the health literacy literature, further identified the articles as being “difficult” to read, with a mean (SD) score of 44.8 (14.4) out of a possible 100 (with lower scores denoting more complex articles) (Table 2).

Discussion | Low health literacy is associated with poor adherence to medication use, increased hospitalization, and increased mortality. Improving patient health literacy, of which readability is 1 component, could boost patients’ confidence to play a more active role in the health care decision-making process.
The lack of consistent oversight of online content can result in inappropriately technical patient education resources.\(^6\) Given that a majority of the patient education sources from the 20 dermatology organizations were written above the National Institutes of Health–recommended reading level, these existing resources should be revised to reach a broader patient audience.

A limitation to this study is the lack of patient feedback in assessing the quality of online health care resources. Using quality assessment metrics to subjectively evaluate the online user experience may capture criticisms missed by our quantitative approach. Participants could reflect on the quality of noncontextual components such as graphics, website design, interactivity, and user friendliness. A greater emphasis must be placed on developing simpler online dermatologic education resources, given the influence these materials can have on patient decision making in the clinical setting.

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Necrolytic Migratory Erythema–like Skin Lesion During Gefitinib Treatment: A Rare Cutaneous Adverse Reaction

Gefitinib is an orally administered epidermal growth factor receptor (EGFR) tyrosine kinase inhibitor used to treat non–small-cell lung cancer (NSCLC).\(^1\) The expression of EGFR is strong in epidermis and epidermal appendages, as well as in tumor cells, and so treatment with gefitinib can result in dermatologic adverse effects with various manifestations.\(^1\)

We report a case of necrolytic migratory erythema (NME)-like skin lesions developing during treatment with gefitinib. We believe that this case demonstrates a rare cutaneous adverse reaction to gefitinib and highlights the need for suspicion of this rare condition during the course of treatment with gefitinib.

Report of a Case | A 56-year-old man was diagnosed with NSCLC and treated with oral gefitinib (250 mg/d). After 3 months of gefitinib treatment, he presented with a 1-month history of localized, painful, migratory, coalescing, eroded, erythematous plaques with scales on both lower extremities and buttocks, especially in the perineal, inguinal, and thigh regions (Figure 1). The eruption had begun as erythematous macules on the perineal area and had spread to the buttocks, inner thighs, and lower extremities within several days. These lesions had coalesced, and some of them had been rubbed off. No mucosal lesions or active changes of the hair or nails were observed.

Initially, a diagnosis of tinea cruris was considered, but no fungal elements were detected in the potassium hydroxide test. A skin biopsy specimen from a thigh lesion showed upper epidermal pallor with focal vacuolated keratinocytes and mild to moderate superficial perivascular dermal infiltrate (Figure 2). Findings of periodic acid–Schiff staining were negative. A diagnosis of NME was considered, but laboratory tests revealed normal levels of glucagon (48 pg/mL; normal range, 25-250 pg/mL) and zinc (68 μg/dL; normal range, 60-120 μg/dL). Additional laboratory findings, including from hemoglobin and albumin assays and liver function tests yielded normal results. Computed tomography of his abdomen did not reveal any pancreatic mass. Despite treatment with oral prednisolone (0.5 mg/kg/d and subsequently tapered over 2 weeks) and clobetasol propionate, 0.05%, ointment, the skin eruptions worsened. Thus the treatment with gefitinib was discontinued.

After withdrawal of gefitinib, the skin eruptions improved significantly in the short term. Four weeks later, gefitinib was readministered under observation by his oncologist, but skin eruptions developed again. Thereafter, he began receiving palliative care without chemotherapy, and at last follow-up, his overall health had been declining after 1 year of palliative care.

Discussion | Cutaneous adverse reactions have been reported as one of the most common adverse events in patients treated with EGFR inhibitors, with prevalence ranging from 50% to