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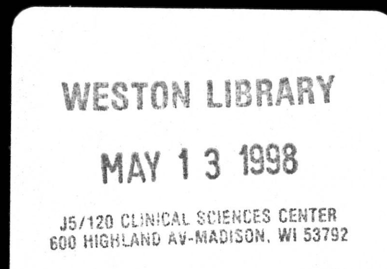

• CME article

Vitiligo

Stephen O. Kovacs, MD
St. Louis, Missouri

• Self-Assessment examination

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Effect of onychomycosis on quality of life

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Background: Onychomycosis impairs normal nail functions, causes considerable pain, interferes with daily activities, and has negative psychosocial effects.
Objective: Our purpose was to determine patients' perception of onychomycosis on the quality of life.
Methods: A total of 258 patients with confirmed onychomycosis were surveyed by telephone at three centers. Responses to a standardized quality-of-life questionnaire were analyzed for patient demographics, physical and functional impact, psychosocial impact, and economic impact.
Results: Highest positive responses were nail-trimming problems (76%), embarrassment (74%), pain (48%), nail pressure (40%), and discomfort wearing shoes (38%). Ability to pick up small objects was impaired in 41% of subjects with fingernail involvement. More than 58 onychomycosis-related sick days and 468 medical visits (1.8 per subject) were reported during a 6-month period.
Conclusion: Onychomycosis has significant social, psychologic, health, and occupational effects. Relevance of quality-of-life issues to overall health, earning potential, and social functioning should prompt reconsideration of the value of aggressive treatment of and financial coverage for onychomycosis.
(J Am Acad Dermatol 1998;38:702-4.)

Onychomycosis is the most common nail disease, and the number of persons affected appears to be rising, especially among the elderly. In one year (1989 to 1990), 662,000 Medicare patients (older than 65 years) made nearly 1.3 million visits to physicians for the treatment of onychomycosis, resulting in a cost of more than $43 million.[1] Spontaneous remission of onychomycosis after treatment is rare, and recurrence is common.[2] Medications used in the past have been limited by the need for prolonged treatment periods and low cure rates. However, newer agents, such as terbinafine and itraconazole, have been shown to be safer and more effective.[2-4] With more effective treatment options, the impact of onychomycosis on patients' quality of life is worth examining.

When nails are infected, normal tactile functions may be impaired or lost, and patients may experience pain or discomfort. Toenail dystrophy may interfere with walking, standing, exercise, or proper shoe fit, and fingernail infection may limit activities such as typing or playing a musical instrument. Onychomycosis also has psychosocial effects related to patients' concerns about the appearance of their nails: embarrassment, reduced self-esteem, and social withdrawal are commonly reported.[1]

The first study to document the effect of onychomycosis on quality of life was by Lubeck et al.[5] in 1993. Significantly lower quality-of-life scores for almost all measures were found. Our pilot study examined quality of life in 20 patients with onychomycosis of an average duration of 11 years.[6] Twenty-five percent reported paresthesias, 30% reported loss of fine touch, 35% reported

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pain, and 20% reported problems with retrieval of small objects. Similar proportions of patients described recreational problems caused by difficulty to perform or embarrassment, fear of injury, as well as interference with social and professional relationships. This study extended these findings by investigating a larger patient population.

PATIENTS AND METHODS

A total of 258 subjects were interviewed by questionnaire: 118 (46%) from Massachusetts General Hospital, 99 (38%) from Columbia University College of Physicians and Surgeons, and 41 (16%) from the University of Texas Medical Branch at Galveston. The subjects were generally healthy, had a median age of 51.5 years, and were predominantly white and male. Thirty-seven percent took prescription drugs daily, mostly for hypertension or for cardiac or pulmonary conditions. About half were employed in white collar or professional positions; the median household income was about $60,000. Seventy percent had attended college, and 94% had some form of medical insurance. Few differences were noted among the three centers, although the population from Texas included a higher proportion of women (49% vs 39% and 25% at the other two sites) and was less affluent (22% with income over $60,000 vs 49% and 53% at the other two sites).

The questionnaire consisted of 57 questions divided into patient, physical and functional, psychosocial and economic domains. The questions were developed on the basis of the authors' experience, the pilot study at Massachusetts General Hospital, and the quality-of-life instrument developed by Lubeck et al.[5] Interviewers presented the questions by telephone. The high and complete (95%) response rate indicated favorable patient acceptance of the questionnaire. For perceptions of general health and impact of onychomycosis, subjects were asked to respond on a five-point scale (excellent to poor, and no problem to very severe problem). All other physical, functional, and psychosocial questions had four possible responses: absent, mild, moderate, or severe. Quality-of-life scores were determined by assigning a weighted average to the responses as follows: absent = 100, mild = 66.6, moderate = 33.3, severe = 0.

RESULTS

The mean duration of nail fungal disease in the study population was 9.5 years. At the time of the interview, 227 subjects (88%) had active nail disease. More than half with fingernail disease and about 35% of those with toenail disease had had involvement of one to three nails. All 10 digits had been affected in 15% of subjects with fingernail and 28% of those with toenail involvement. Nearly 40% reported an associated fungal infection on the soles during the past 3 years.

Onychomycosis affected the fingernails alone in 23 subjects (9%), the toenails alone in 128 (50%), and both the fingernails and toenails in 107 (41%). The group with toenail involvement alone included a significantly ($p < 0.05$) higher proportion of men (63% vs 43%), white subjects (88% vs 74%), and subjects employed in white collar or professional positions (61% vs 39%) than the group with fingernail involvement alone. Seventy percent of subjects considered their nails to be at least a moderate problem. Subjects with toenail involvement alone perceived their problem as more serious, with 19% categorizing it as severe or very severe as compared with 30% with fingernail involvement alone and 46% with both toenail and fingernail involvement. This difference was also significant ($p < 0.05$).

Of the 130 subjects with fingernail involvement, 54 (42%) reported tingling, burning, numbness, pressure, or discomfort. These feelings were reported by all 235 subjects with toenail involvement. A total of 193 (75%) of the 258 subjects were embarrassed about their nails. The extent of embarrassment was described as mild by 56 (29%), moderate by 74 (38%), and severe by 63 (33%). Embarrassment was reported significantly less frequently ($p < 0.05$) by subjects with toenail involvement alone (66%) than by those with fingernail involvement alone (74%) or involvement of both fingernails and toenails (85%). Onychomycosis was more likely to cause embarrassment for women (83%) than for men (71%). Moreover, women were more likely than men to feel severe embarrassment (44% vs 26%). Thirty-two subjects (12%) reported that their infection had interfered with social relationships and 38 (15%) had avoided social situations because of their condition.

More than 58 days of sick time were reported as a result of onychomycosis, and 468 medical visits (1.8 per subject) were made for nail-related reasons during a 6-month period. Subjects with toenail involvement sought medical care significantly more often than those with fingernail involvement ($p < 0.001$). A total of 249 subjects (97%) stated that they would be willing to pay for a nail fungus medication with an 80% cure rate, even if their insurance would not cover the cost. However,

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although women were more embarrassed about their disease, men were more willing to pay for treatment. Regression analysis showed a relation between the willingness to pay more than $100 for a treatment with an 80% cure rate and male sex (1.5-fold), household income, and a greater level of embarrassment (3.7-fold). The number of patients willing to pay for treatment not covered by insurance decreased to 148 (57%) when the theoretic cure rate was reduced to 35%.

DISCUSSION

Our subjects all volunteered for clinical trials on onychomycosis and were therefore a self-selected population likely to perceive their disease as significant. In addition, in our study, nail disease severity was judged by patients without reference to anything external (i.e., they could say their nails were severely affected, then separately and subsequently deny physical pain and discomfort and even functional and psychosocial problems). For these reasons, quality-of-life scores often do not correlate with self-reported "global" severity ratings. In other words, severity and quality of life are two separate and different measurements that often do not overlap.

There is strong support for the physical and psychosocial value of treating non-life-threatening but disfiguring skin conditions. Toenail infection can contribute to social isolation; in the elderly, for example, the ability to walk is crucial to remaining active in society.[7,8] Our results indicate that onychomycosis should be included among the cutaneous disorders with social, psychologic, and occupational effects, as well as possibly predisposing persons to more serious medical disorders.

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