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Invited review article

Assessment of severity and burden of pruritus

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Abbreviations:
BDI, Beck Depression Inventory; DLQI, Dermatological Life Quality Index; DPS, Dynamic Pruritus Score; EADV, European Academy of Dermatology and Venereology; HADS, Hospital Anxiety and Depression Scale; HRSD, Hamilton Rating Scale for Depression; IFD, Itch-Free Days; IFSI, International Forum for the Study of Itch; NRS, numerical rating scale; PBI-P, Patient Benefit Index-Pruritus; RCT, randomized controlled trial; SF-36, 36-item short form; SSS, Scratch Symptom Score; VAS, visual analogue scale; VRS, verbal rating scale

ABSTRACT

Chronic pruritus is a complex multifactorial symptom associated with many different diseases that represents a diagnostic and therapeutic challenge for physicians. In order to better manage chronic pruritus, a detailed medical history, individualized diagnostic procedures and treatment approaches are necessary. Treatment should not only take itch into consideration, but also scratching-induced skin lesions and accompanying disorders such as anxiety, depression and insomnia. Various standardized questionnaires and scales have been developed to assist in the characterization and assessment of these parameters. Monodimensional scales (e.g. the visual analogue scale) represent a simple method for assessing pruritus intensity and are frequently used; however, they can easily be confounded and may indicate the level of satisfaction regarding the medical care provided rather than the itch course. The Dynamic Pruritus Score and Itch-Free Days questionnaire enable a closer assessment of patient responses to treatment. Because chronic pruritus has the potential to greatly impact the quality of life, it is important that physicians recognize it as a major issue. The Dermatology Quality of Life Index is an instrument that is used in a variety of dermatological conditions, but may be unsuitable for measuring pruritus of extracutaneous origin. The ItchyQol is a tool designed specifically for those suffering from pruritus. Additional tools, such as the Hospital Anxiety and Depression Scale, take psychiatric comorbidities into consideration. Recommendations from European (EADV-based Task Force Pruritus) and international (International Forum for the Study of Itch) expert groups focusing on assessment instruments for chronic pruritus are also provided in this article.

Introduction

Pruritus is the most common symptom in dermatology with estimates showing that more than one-third of the patients attending dermatological practices suffer from this symptom, a majority of those chronically.[1] The Global Burden of Disease project listed pruritus as one of the 50 most common interdisciplinary symptoms leading to high burden levels.[2] Chronic pruritus, i.e. pruritus lasting longer than 6 weeks, affects almost one fifth of the general population leading to great impairment of quality of life.[3] It should be thoroughly investigated, since not only dermatological conditions cause chronic itch, but also systemic, neurologic or psychiatric diseases. Furthermore, different diseases may be present simultaneously or, in some instances, the cause may remain unknown.[4]

Since pruritus is a subjective symptom of multifactorial nature, its assessment may be challenging.[5] The International Forum for the Study of Itch (IFSI) established a classification system dividing chronic pruritus into one of three categories upon physical examination: i) chronic pruritus on inflamed skin; ii) chronic pruritus on normal skin and iii) chronic pruritus with severe scratch lesions.[4] This classification helps the attending physician to direct the diagnostic efforts in order to determine the underlying cause. Many factors, such as location, duration of the disease, intensity and accompanying sensory symptoms (e.g. burning, tingling or stinging sensations), should be taken into account. Moreover psychiatric comorbidities (e.g. depression and anxiety), current mood or stress levels may affect the pruritus perception and appraisal and thereby confound the assessment of the symptom. In order to enable a

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comprehensive view on the symptom and current level of confounders, multiple instruments are recommended in the assessment of chronic pruritus.[5]

Only a minority of patients suffering from chronic pruritus has access to specialized centers. As a result the underlying causes are often not comprehensively investigated and patients may receive sub-standard care. Additionally treatment costs may be high and some of the available therapy options are not covered by national health systems or by health insurances. A higher awareness of the societal burden is thus necessary in order to achieve a better standardized care. Measuring itch is essential not only for the proper care of the individual patients but also to raise awareness of the relevance of chronic pruritus in health care. Furthermore, in randomized clinical trials (RCT) measurement of pruritus should be performed in a standardized manner to allow comparisons between studies and ensure the highest medical and professional standards.

This review article aims to give an overview of the available instruments for the measurement of itch (Table 1) and to give recommendations for their use in patient care and in RCTs.

Pruritus intensity

An assortment of scales has been developed in order to better assist physicians in assessing pruritus intensity. The intensity can be quickly measured with monodimensional scales that are routinely used in clinical care and RCTs. Patients can be asked to rate their itch intensity from 0 ("no itch") to 10 ("worst imaginable itch") with the numerical rating scale (NRS; Fig. 1). Another monodimensional scale, the visual analogue scale (VAS), provides patients with the opportunity to indicate the intensity of their itch by marking on a 10 cm long, ruler-shaped scale. Both endpoints are marked with a number corresponding to the intensity, with 0 representing "no itch" and 10 the "worst imaginable itch" (Fig. 2). A variation of this scale demonstrates to patients that at one-third of the length corresponding to 3.3 cm, they would normally feel the urge to scratch. However, this biases the patient and should not be used in RCTs. Scores below 3.0 VAS/NRS points are generally

Table 1
Overview of tools used for measuring pruritus.

	Tool
Intensity	*Monodimensional:* • Visual analogue scale • Numerical rating scale • Verbal rating scale *Multidimensional:* • Itch Severity Scale • Pruritus Grading System
Scratch lesions	• Scratch Symptom Score • Prurigo Activity Scale
Scratching activity	• Actigraphy • Accelerometer
Course of pruritus	• Dynamic Pruritus Score • Itch-Free Days • 5-D Scale • Patient Benefit Index • ItchApp®
Psychiatric comorbidities	• Hospital Anxiety and Depression Scale • Beck Depression Inventory • Hamilton Rating Scale for Depression
Sleep impairment	• Stanford Sleepiness Scale • Epworth Sleepiness Scale • Athens Insomnia Scale
Quality of life	• ItchyQol • Dermatological Life Quality Index • 36-item short form

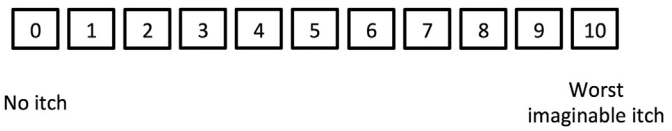

Fig. 1. Numerical rating scale.

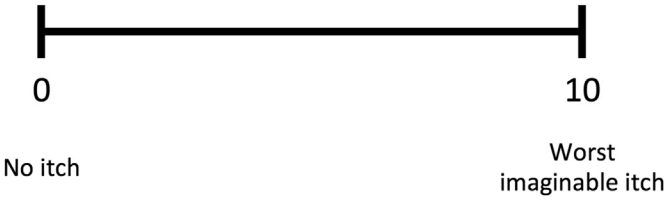

Fig. 2. Visual analogue scale.

associated with mild itch, whereas scores higher than 6.9 illustrate severe itch. Scores above 9.0 represent a very severe itch.[6] The verbal rating scale (VRS) is a further monodimensional scale that allows patients to describe their itch intensity by means of gradually rising adjectives (0 – no itch, 4 – worst imaginable itch).[7] The NRS, VAS and VRS have been validated in large-scale studies consisting of chronic pruritus patients with pruritic dermatoses or pruritus of various origins. These instruments have high reproducibility and there was a high correlation between scales.[6–8] There is still no consensus on the best recall period (12 h, 24 h, 3 or 7 days). In RCTs it is common to address the past 24 h. However, these scales only provide the itch intensity at a specific point in time, being susceptible to cofounders such as current mood, stress and comorbidities. Multidimensional scales, such as the Itch Severity Scale,[9] a self-reported seven-item scale, can be alternatively used but are not routinely established in clinical care. They combine itch intensity, sleep disturbance and burden by the symptom aiming to give a comprehensive rating of the itch impact. However, patients may face difficulties in unequivocal selection of a category. Thus, these instruments are not recommended to be used in RCTs until more research describes their validity in chronic pruritus assessment.

Scratch lesions and scratching activity

Scratch lesions may be an indirect sign indicating the severity of a pruritic condition (Fig. 3). The Scratch Symptom Score (SSS) and the Prurigo Activity Score are descriptive tools that have been constructed for use in monitoring scratch lesions over time.[10] However, they are not validated yet limiting their use in RCTs. Alternatively, wrist actigraphy, a non-invasive method of monitoring motor activity, can be utilized to assess scratching behavior in humans.[11,12] Accelerometers are devices that measure proper acceleration and can be used for similar purposes. Both methods of objectively measuring scratch activity are mainly used for research purposes or RCTs but not in daily practice. However, scratch lesions and scratching activity do not necessarily demonstrate the severity of the pruritus. To prevent the development of lesions, some patients refrain from scratching despite intense pruritus, while others wear gloves, apply ice or cold water to the affected areas, or adopt other various strategies to cope with the pruritus and hamper the urge to scratch.[5] In some cases, such as in hydroxyethyl starch-induced pruritus, scratching enhances the itch sensations and thus patients avoid to scratch and usually do not develop scratching lesions. On the other hand, patients with an automatic scratching behavior may present with extensive lesions in spite of an absence