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Pruritus in elderly: Classification and management

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Abstract

Pruritus is majority complaint that is often encountered in dermatology. The diagnosis and management of pruritus still became important health problem in elderly. It is estimated that one fifth of the world's population experience chronic pruritus which can affect their quality of life. The lifetime prevalence of chronic pruritus in the general population was 22%. In the elderly, two thirds of the population are reported to experience pruritus. Based on the onset of symptom, pruritus is divided into acute pruritus and chronic pruritus. While based on clinical complaints, pruritus is divided into pruritus originating from the skin, neuropathic pruritus, neurogenic pruritus, and psychogenic pruritus. Elderly skin is sensitive skin, which often gives complaints of itching. Pruritus, especially in elderly, requires treatment that must be adapted to the pathophysiology. Treatment of pruritus in the elderly can include topical therapy, systemic therapy and phototherapy. The management approach to pruritus consists of 4 important pillars, namely basic therapy, targeted therapy, symptomatic therapy, and therapy for accompanying diseases.

Keywords: Pruritus; Elderly; Sensitive Skin; Human and Health

1. Introduction

Pruritus or itch is a very common complaint in the general population, yet it is difficult to diagnose and manage, that may lead to intensive scratching. The lifetime prevalence of chronic pruritus in the general populations is 22%. It is estimated, that one fifth of world's population experience chronic pruritus once in their life. Pruritus can occur with or without accompanying apparent alterations in the skin. Patients with a history of a stroke had better overall health-related quality of life compared to those without, as seen by fewer sleep problems, mood disorders, negative psychosocial impact, and a substantial overall improvement in quality of life. Kurniawan et al. observed a significant positive association between the intensity of itching and the overall quality of life of those ($r=0.923$, $p=0.000$) [1–4].

Pruritus is classified into two categories, acute pruritus and chronic pruritus, based on when the symptoms first appear. Pruritus, which is characterized by itching, is classified into four categories based on clinical symptoms: pruritus originating from the skin, neuropathic pruritus, neurogenic pruritus, and psychogenic pruritus [5–7]. Pruritus can be caused by various diseases, both dermatological and non-dermatological diseases. Pruritus accompanied by inflammatory lesions on the skin may be caused by dermatological disease. Pruritus without inflammatory skin lesions can occur in systemic diseases, neuropathic causes and psychogenic causes [1,8].

The management of pruritus is tailored to the specific underlying condition and its pathophysiology. Pruritus in the elderly can be treated with topical therapy, systemic therapy, and phototherapy. The management strategy for persistent pruritus contains four crucial pillars, including fundamental therapy, targeted therapy, symptomatic therapy, and therapy for concomitant disorders [2,5].

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2. Epidemiology

Chronic pruritus is the most common complaint in elderly. The lifetime prevalence of chronic pruritus in the general populations is 22%. It is estimated, that one fifth of world's population experience chronic pruritus once in their life. The prevalence in general population was reported 8-38 % worldwide, and the incidence among elderly was 11.5-25% that especially occurred in elderly over age 85. In United States, it was reported that 23-44 million people are estimated suffer from chronic pruritus caused by cutaneous and systemic condition [1,4,9].

A report from Surabaya-Indonesia showed that pruritus was the most common complaint in the elderly (60.87% of 182 patients) and the majority skin disease was xerosis cutis (29.79% of 182 patients). Yusaryahya et al reported there were 127 elderly patients who suffered from pruritus in 6 years period in Ciptomangunkusumo Hospital Jakarta Indonesia, and the majority age group was 60-65 years old. The causes of pruritus in this study were xerosis cutis (63.78%), senile pruritus (19.69%), pruritus of systemic disease (7.87%), and other etiology (8.66%) [10,11].

3. Classification and Clinical Manifestation

Pruritus or itch is one of the symptoms that often cause distress. Most pruritus is caused by skin disease and/or nervous system disorders. However, pruritus can also be caused by other causes. The causes of pruritus are classified into skin-derived pruritus, neuropathic pruritus, neurogenic pruritus, psychogenic pruritus and mixed pruritus [6,12].

Skin-derived pruritus is caused by skin inflammation, damage or dryness, which results from conduction of C nerve fibers, for example pruritus in atopic urticaria, scabies. Neuropathic pruritus is linked to abnormal alterations in the pathways that transmit sensory signals across nerve fibres, such as in the case of postherpetic neuralgia. Neurogenic pruritus originates in central nervous system, through induction and transmission of mediators and receptors without nerve damage, for example bile stasis itching. Psychogenic pruritus arises from psychological variables and psychiatric problems, such as parasite fear. Mixed pruritus arises from a combination of many variables, such as atopic dermatitis [5,6].

Based on the onset of symptom, pruritus is divided into acute pruritus and chronic pruritus. Acute pruritus present for less than 6 weeks. The cause of acute pruritus can usually be identified easily. Its management is easier and the response to therapy is better than chronic pruritus. Pruritus is considered chronic pruritus, if occurs more than 6 weeks. It is estimated that one fifth of the global population has chronic pruritus, which has a major impact on an individual's quality of life [5,13].

The prevalence of chronic pruritus in the elderly increases with age. In Hispanic population, 25% of the elderly population was reported having intense pruritus. According to the skin condition or the clinical manifestation in the elderly, chronic pruritus is classified into 3 types. Group I is pruritus on inflamed skin, Group II is pruritus on normal skin, and Group III is pruritus with chronic scratch lesions. The classification of chronic pruritus is related to the diagnostic tests that can be performed. Pruritus on inflamed skin or due to chronic scratching can be subjected to a histopathological examination. While pruritus on normal skin or with chronic scratching lesions can be carried out by laboratory examination to evaluate possible systemic or neurological disorder [5,14,15].

Atopic dermatitis, psoriasis, contact dermatitis are included in Group I pruritus. Group II pruritus can be caused by systemic disorder, neuropathic disease, or psychogenic disease. Cholestatic itch, uremic itch, paraneoplastic itch and diabetic itch are pruritus caused by systemic diseases. Neuropathic disease in Group II pruritus can include brachioradial pruritus, anogenital pruritus, postherpetic neuralgia, notalgia paresthetica. Psychogenic causes in Group III pruritus can include delusions of parasitosis, excoriation disorder, parasitic phobia [2,6,14].

Classifying chronic pruritus according to its etiology is crucial for the therapy of pruritic patients. It will be possible to determine the cause of persistent pruritus by first obtaining a medical history and then completing a physical examination, laboratory test, or other supportive examinations. There are several types of chronic pruritus, including somatoform illnesses, neurological disorders, skin diseases, and pruritus resulting from systemic diseases. Pruritus frequently has multiple causes, but it can also result from an unidentified illness (pruritus of unknown origin) [5,13].

4. Chronic Pruritus in Elderly

As the age increases, the elderly skin also change. The process that occurs in skin aging is a combination of three processes, including a decrease in the proliferation ability of skin cells, a decrease in the synthesis of the skin's

extracellular matrix, and an increase in enzyme activity that degrades collagen in the dermal layer. Skin cells, including keratinocytes, fibroblasts and melanocytes, decrease in number with age. A decrease in the number of fibroblast cells will cause a decrease in collagen biosynthesis in the dermal layer. Slowed proliferation of skin fibroblast cells also affect collagen production in the dermal layer, causing skin aging and wrinkles. Apart from that, there is also an increase in the activity of the matrix metalloproteinase (MMP) enzyme which causes increased collagen degradation in dermal layer. The epidermal layer in the elderly is thinner. There will be changes in skin pH, a decrease in the work of the sebaceous and sweat glands in elderly. All of these changes cause dry skin in the elderly, which often accompanied with pruritus [13,16,17].

Age-related senescence of the immune system occurs. In aging process, T cell dysregulation occurs. The protective mechanism by Th1 will decrease, which contributes to increased Th2 activation. Autoimmunity conditions will increase and loss of immunologic balance will result in diminished self-tolerance [13].

In the aging process, damage to the central and peripheral nervous system occurs, which plays a role in detecting, transmitting or processing pruritus. Damage to the central and peripheral nervous system potentially causes chronic neuropathic pruritus. Some examples of pruritus due to neural changes are brachioradial pruritus, post-stroke pruritus or pruritus in diabetes mellitus patients [13].

5. Approach to Pruritus

Pruritus can manifest either as a localized or generalized condition. When dealing with localized itching, it is essential to assess the presence of a skin lesion. If localized pruritus is accompanied by skin lesions, treatment can be administered based on the specific skin condition, and a skin biopsy can be conducted to confirm the diagnosis of the underlying skin disease. If no skin lesions are detected, the localized itching can be attributed to psychogenic or neurogenic factors [2,4].

Treatment of generalized pruritus with skin lesions, may be administered according to the protocol, or a skin biopsy may be performed to assist in establishing the diagnosis. Whereas in generalized pruritus without skin lesions, xerosis cutis should be ruled out first, then followed by an evaluation of whether systemic disease is involved. Pruritus is often a sign of severe systemic disease. Systemic disease is present in 14-24% of pruritic patients without skin lesions [2,4,8].

Initial care of pruritus involves basic treatments such as administering emollients, antihistamines, and avoiding allergens. In cases with pruritus associated with an established underlying disease, specific medication can be administered based on the nature of the underlying disease. Meanwhile, in cases of chronic pruritus where the reason is unknown or resistant to treatment, symptomatic medication may be used. In addition, the management of pruritus is given according to the accompanying manifestations, such as the presence of sleep disorder, reactive depression, etc., which can be given at all stages of pruritus management [2,5,18].

6. Management

The management approach to chronic pruritus consists of 4 important pillars, namely basic therapy, targeted therapy, symptomatic therapy, and therapy for accompanying diseases. Whenever possible, management of pruritus should be performed according to the underlying disease or cause. Management of pruritus consist of nonpharmacologic therapy, topical therapy, or systemic therapy. Although the best management of pruritus is according to the underlying disease or cause, several nonpharmacologic interventions can provide benefit to the patient [2,8].

According to the guidelines from Indonesian Society of Dermatology and Venereology, management for pruritus in the elderly consists of topical therapy, systemic therapy and phototherapy. Topical therapy given is in the form of emollients, topical keratolytic, topical immunomodulators, and symptomatic topical therapy. Emollients are given to repair the skin barrier. Topical keratolytic, for example salicylic acid, aim to increase skin hydration and soften the stratum corneum by lowering the skin's pH. Immunomodulators, such as tacrolimus and pimecrolimus, work by affecting C nerve fibers, which play a role in the pathophysiology of pruritus. Systemic therapy for pruritus in the form of symptomatic therapy to reduce itching, in the form of systemic antihistamines. Apart from topical therapy and systemic therapy, additional therapy in the form of phototherapy can be given [19].

Moisturizer administration in pruritus is aimed to improve the skin barrier, especially in pruritus caused by xerosis cutis, which is the most common cause of pruritus in elderly. Improvement of the skin barrier due to routine moisturizer application is expected to reduce transepidermal water loss (TEWL) and increase skin hydration, that cause good skin

barrier function. Individuals with pruritus should avoid excessive bathing, especially hot water bathing and alkaline soap usage. Moisturizer administration seems simple, but it plays an important role in improving the symptoms of pruritus, especially in pruritus with dermatosis as the underlying disease. Apart from choosing appropriate soap and moisturizer, patients are asked to avoid irritants and allergens, thereby reducing the risk of inflammation or irritation of the skin. Apart from that, avoiding stress, relaxation therapy and behavioral therapy often provide good results, for example in pruritus due to atopic dermatitis or chronic pruritus [2,13,20].

7. Topical therapy

Several topical agents can be given for the management of pruritus, including topical corticosteroids and calcineurin inhibitors, through their anti-inflammatory effects. Topical corticosteroids and topical calcineurin inhibitors break the itch-scratch cycle in inflammatory skin diseases, so that the risk of secondary infections is also reduced [6,8,13].

7.1. Topical corticosteroid

In inflammatory skin disease, topical corticosteroids can be used to improve the inflammation and reduce pruritus caused by skin inflammation. The anti-inflammatory effect of corticosteroids reduce the pruritus. Topical corticosteroids are indicated for pruritus with short intervals. Topical corticosteroids are not indicated for chronic pruritus, because its side effects such as skin atrophy, dry skin, corticosteroid-induced acne, or rosacea may occur [6,8].

7.2. Topical calcineurin inhibitor

Topical calcineurin inhibitor is indicated for inflammatory skin disease. It has anti-inflammatory effect and reduce pruritus. Pimecrolimus 1% cream or tacrolimus 0.03-0.1% ointment is indicated for pruritus caused by atopic dermatitis, contact dermatitis or facial pruritus. Pimecrolimus and tacrolimus may cause side effects such as transient stinging and burning sensation [6,8].

7.3. Other topical therapy

Apart from topical corticosteroids and topical calcineurin inhibitors, several topical agents that can be used for pruritus include capsaicin and menthol, which can be used for localized pruritus. Capsaicin is given at a concentration of 0.025-0.1%, especially indicated for neuropathic pruritus or pruritus caused by chronic kidney disease. The side effect of capsaicin is burning sensation, that especially occur in the first 2 weeks of administration. Menthol is given at a concentration of 1-5% cream; can cause side effects such as skin irritation, hypersensitivity and burning sensation, especially at high concentrations. Topical anesthetic can be given to uremic pruritus or neuropathic pruritus. Apart from that, emollients can be given, especially for pruritus caused by allergic skin disease such as atopic dermatitis, xerosis cutis or due to skin barrier damage [6,8,13].

8. Systemic therapy

8.1. Antihistamine

Antihistamines, especially sedating antihistamines, are often used as first line treatment for pruritus in clinical settings. However, there is minimal data of randomized controlled trial showing the effectiveness of antihistamines as a treatment for pruritus caused by other than allergic skin disease [8,12].

The recommended antihistamines are H1 receptor antagonists, such as hydroxyzine and diphenhydramine. Hydroxyzine is given at a dose of 25-50 mg, four times daily; while diphenhydramine is given at a dose of 25-100 mg orally, four times daily. H1 receptor antagonists work by blocking the histamine releasing, and pruritus caused by histamine release will improve. Disadvantages of H1 receptor antagonists for some people are sedative effect and anticholinergic effect. Some people complain about dry mouth, nausea, and headaches. To minimize the side effects that can occur due to H1 receptor antagonists, low sedating antihistamines such as loratadine or cetirizine can be given. Antihistamines are indicated especially for pruritus due to allergic skin disease. Antihistamines do not respond well to other causes, such as uremic pruritus nor cholestatic pruritus [8,12].

8.2. Opioid antagonist

Opioid antagonists such as naltrexone and naloxone can be used to treat uremic pruritus and cholestatic pruritus. Naltrexone is given at a dose of 12.5-50 mg orally once daily. The side effects of opioid antagonist include reverse analgesia, lead to withdrawal symptoms, nausea, vomiting, abdominal cramps, diarrhea, and hepatotoxicity [6,8,12].

8.3. Serotonin modulator

Blocking the reuptake of serotonin into presynaptic vesicles by serotonin modulator therapy, which causes an increase in serotonin concentration in the central nervous system, will reduce itching. Opioid antagonists used in the management of pruritus are ondansetron, mirtazapine, paroxetine, and sertraline [6,8,12].

Ondansetron is a serotonin-5-HT₃-receptor antagonist, which is used in the management of uremic pruritus and cholestatic pruritus. Mirtazapine is usually used in cases of depression or post-traumatic stress disorder. Apart from that, Mirtazapine can be given for the management of uremic pruritus and cholestatic pruritus, with an initial dose of 7.5-15 mg daily. Mirtazapine can have sedative and weight gain side effects. Paroxetine is a serotonin reuptake inhibitor, which can be given for the management of uremic pruritus and cholestatic pruritus, with an initial dose of 5-10 mg/night to 10-40 mg orally once daily. The side effects of paroxetine that can occur include insomnia and dry mouth. Sertraline is a serotonin reuptake inhibitor, which is the first line therapy for uremic pruritus. A double blind clinical trial showed that sertraline was effective given a daily dose of 100 mg for cholestatic pruritus [6,8,12,21].

8.4. Antiepileptic drugs

Antiepileptic drugs, such as gabapentin and pregabalin, are usually consumed as anticonvulsant drugs. Antiepileptic drugs can be used to treat pruritus, through a neurogenic pathway blocking mechanism. Gabapentin is an antiepileptic drug that is FDA approved for the treatment of partial seizures and post herpetic neuralgia. For pruritus therapy, gabapentin given at a low dose of 100-300 mg three times a week was reported effective to reduce pruritus. One of the advantages of gabapentin is that there is no drug interaction. Pregabalin has similar effects to gabapentin. Pregabalin is given at a low dose of 25 mg once daily or up to divided dose, especially for neuropathic pruritus [6,8,12].

8.5. Phototherapy

Ultraviolet B (UVB) phototherapy is an option for pruritus, especially if associated with atopic dermatitis, chronic renal failure, cholestatic pruritus or polycythemia vera. It was reported that 80-90% pruritus patients improved within 2 until 5 weeks. Phototherapy was administered three times in a week [8,22].

During initiation of phototherapy of UVB and narrowband ultraviolet B (NB-UVB), pruritus due to erythema caused by photo irradiation may occur. These side effects can improve after 1-2 weeks after phototherapy. However, the use of long phototherapy in patients with a history of skin cancer or on areas of skin that have experienced sun damage must be caution [13,17].

9. Conclusion

Management of pruritus in the elderly must be performed according to the pathophysiology and the underlying disease. Apart from that, treatment of pruritus in the elderly must be given carefully, accounting to comorbidity factors, considering polypharmacy as well as cognitive limitations and potential side effects of drugs.

Compliance with ethical standard

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Disclosure of conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

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