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Medication strategies for the elderly in dermatology

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Abstract: *Elderly patients with skin diseases are often accompanied by other diseases and face the problem of polypharmacy, which increases the risk of adverse drug reactions (ADR). In this paper, the problems of polypharmacy for the elderly in dermatology were discussed, and the principles and strategies of medication for the elderly in dermatology were provided, so as to provide reference for the majority of medical workers when prescribing to the elderly patients with skin diseases*

Keywords: *Geriatric Dermatology; polypharmacy; Medication strategies*

1. Introduction

With the aging of the global population, the problem of drug use in the elderly has become increasingly prominent. Elderly patients are by far the main consumers of medicines; people over the age of 65, who make up 16% of the population, consume one-third of all prescription drugs[1]. 6.5% to 10% of hospitalizations are related to ADR[2]. This fact underscores the need for appropriate prescription treatment. Because the elderly often suffer from multiple diseases and comorbidities, polypharmacy is common in the elderly, which greatly increases the risk of ADR. This article discusses the problem of polypharmacy in the elderly in dermatology, and provides the principles and strategies of drug use in the elderly in dermatology.

2. Polypharmacy in elderly

In elderly patients, polypharmacy may result in serious adverse reactions and potential hospitalization. There are many definitions of polypharmacy, with the most common definition being taking five or more medications per day[3].Increased probability of multiple diseases in the elderly promote the elderly to use a large number of drugs, which may lead to polypharmacy. In such situation, complex drug interactions can cause a host of problems and lead to significant economic costs. And elderly people taking multiple medications or complex drug regimens often have poor medication compliance [4].

Polypharmacy increases the risk of drug-to-drug and drug-to-disease interactions that can affect all aspects of drug action, including absorption, distribution, metabolism, and excretion[5].Adverse drug reactions (ADRs) were positively associated with polypharmacy, with a 13% risk of ADRs in patients taking two drugs at the same time, rising to 38% for four drugs , and 82% for seven or more drugs[6].Multiple drug use is prone to fattening, falling, cognitive impairment, readmission and other adverse outcomes in the elderly, affecting patients' quality of life and increasing investment in medical resources.A systematic review concluded that at least 10% of older patients experienced ADRs that led to or occurred during hospitalization[7].A retrospective cross-sectional study showed that 74.5% of the elderly with a mean age of 74.8 years prescribed ≥5 drugs after a medical visit.There was a significant statistical correlation between polypharmacy and the treatment results of skin diseases in the elderly[8], and the increase in the number of drugs would reduce the possibility of the improvement of skin conditions in the elderly patients.A study in China on the polypharmacy of 360 elderly patients with multiple diseases with an average age of 74.8 years found that, according to the international consensus that ≥ 5 drugs are polypharmacy, the polypharmacy rate is 75.3%, which is close to the level of Western countries[9].In a large-scale study of dermatology in the United States, investigators compared polypharmacy (which they defined as concomitant use of ≥4 drugs) and related clinical factors were investigated. They found that polypharmacy nearly tripled, from 5.6% in 1995 to 18.5% in 2009, with the highest proportion of elderly patients over 65 years old[10].

Comorbidity are also one of the main reasons for polypharmacy. The elderly often suffer from multiple chronic diseases at the same time. Hypertension is the most common systemic disease among the elderly, followed by diabetes, and 5.6% of the elderly are affected by both diseases[11].In China, 42%

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of the elderly suffer from two or more chronic diseases at the same time, with hypertension, diabetes, coronary heart disease, stroke and chronic respiratory diseases being the most common combination, and the prevalence is increasing year by year[12].Studies have shown that cardiovascular drugs are most commonly used by older adults, regardless of the presence of geriatric syndrome[13].Some examples of polypharmacy in dermatology are listed in table 1[14].

Table 1: Problems associated with polypharmacy in dermatology [14]

Type of polypharmacy	Example case	opinion
polypharmacy	A patient with multiple medical conditions had seen four specialists and developed a rash. There are already ten drugs on the drug list, some taken three times a day.	Drug lists should be analyzed and systematically reviewed to ensure that unnecessary drugs are discontinued. Poor patient compliance due to number and frequency of dosing, risk of drug interactions, and potentially unnecessary costs
Drug duplication	Patients with chronic idiopathic urticaria received both oxyzine and cetirizine.	Cetirizine is a metabolite of hydroxyzine, and this combination is redundant. It would be preferable to maximize the dose of the less sedating cetirizine, add an H2-antagonist to provide a synergistic effect, or substitute the antihistamine for another medication.
Drug-drug interaction	Atrial fibrillation patients taking digoxin receive doxycycline for rosacea Oral ketoconazole therapy in patients with extensive candidiasis receiving concurrent high-dose statin therapy	Tetracyclines affect digoxin levels and can lead to toxicity. Another medication should be considered or the digoxin level should be closely monitored. Azoles are CYP450 inhibitors that increase the risk of statin-induced rhabdomyolysis. During antifungal therapy, statin doses may need to be reduced or temporarily maintained.
Prescribing cascade	A patient with chronic venous insufficiency was prescribed amlodipine by a physician for hypertension, developed leg swelling and eczema, was treated with furosemide and topical steroids, and then presents with a generalized morbilliform eruption.	Sometimes medication side effects are misinterpreted as either ‘‘normal’’ aging or a new medical condition, which leads to additional medications to treat the iatrogenic condition. If the prescription is inaccurate or unreviewed, it is best not to continue the prescription to treat the side effects of the previous drug, which can easily create a vicious circle.

3. Geriatric dermatology medication strategy

With the reduction of polypharmacy, the incidence of adverse effects, drug interactions, or medication nonadherence may be decreased.However,in some cases, it may be in the patient's best interest to prescribe multiple drugs,because these drugs cannot be replaced by non-drugs and may improve their quality of life.After determining that the potential benefits outweigh the risks,dermatologists should provide counseling to patients and caregiver,involve the primary care provider in decision-making, and attempt to mitigate the potential side effects using heuristics that are outlined below.

3.1. Pay attention to the physiological changes of elderly patients

Hepatic and renal drug clearance is reduced in the elderly, which may lead to prolonged drug half-life and increased risk of drug toxicity and adverse effects.The absorption capacity of the skin should be considered when topical application.In the elderly, cell turnover is reduced, and the skin's ability to absorb drugs may be poor. At the same time, the skin lipid and barrier function are reduced, which makes the skin prone to dryness and itching, and is more susceptible to infection. At the same time, it is

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necessary to pay attention to skin care to prevent accidental damage.

3.2. Assessment of risk-benefit ratio

Consider whether a reasonable nonpharmacologic or nonsystemic alternative might exist.Because systemic therapy is generally considered to be riskier for older patients, topical therapy is still considered first-line therapy with lower frequency and severity of adverse effects[15].For example, elderly patients with psoriasis can use NB-UVB phototherapy as the first choice of treatment.If necessary, prioritize essential or topical medications and avoid "high-risk" medications that cause side effects or geriatric syndromes such as gastrointestinal bleeding, delirium, urge incontinence, cognitive changes,and postural hypotension that causes falls.When highly effective topical steroids are prescribed, prevent potential misuse or long-term use, which can exacerbate skin atrophy in older adults and carry the risk of side effects, such as steroid dermatitis, delayed wound healing, or secondary infections.Try to avoid prescribing fixed topical steroids and antifungal or antibiotics, especially when treating intertriginous areas.Also, when treating eczematous eruptions frequently seen in the elderly,should avoid products that are potential allergens.If immunosuppressive therapy is initiated, antimicrobial prophylaxis should be considered because age-related changes in the innate and adaptive immune systems put the elderly at a higher risk of infection.Have in mind prophylaxis for osteoporosis and gastritis since prescribing long-term corticosteroid therapy.If the patient is prone to anemia, caution should be exercised with medications that may aggravate or cause anemia[16].

3.3. Start low, go slow, and define a priori endpoints

It is important to negotiate reasonable expectations for therapeutic endpoints with the elderly and to weigh these against the potential side effects.For example,a reduction in pruritus by half.It is safest to prescribe at a lower than usual adult dose, especially with medications that have a relatively narrow therapeutic window (eg, methotrexate).Drugs that fail to produce a therapeutic effect should not be used indefinitely.

3.4. Recognition of potential medication interactions

Concerned about the interaction of several dermatological drugs frequently used by elderly patients with other prescriptions,such as warfarin, digoxin, and statins.Dose adjustments should be made prior to changes in hepatic enzyme induction and inhibition.Because of the high cardiovascular morbidity and risk of drug interactions, cyclosporine should be used with extreme caution in elderly patients, as well as in patients with renal impairment or reduced glomerular filtration rate. Whenever possible, choose a medication that can treat two conditions.For example, a long-acting calcium channel blocker might help a patient with Raynaud phenomenon, poorly controlled hypertension, and a history of coronary artery disease. Starting only one new drug at a time can also effectively reduce drug-to-drug adverse effects. In clinical practice, concentrating prescribing on priority drugs that have been shown to have the greatest benefit, while ignoring the use of other drugs, has the potential to limit polypharmacy and reduce adverse effects [6].Doctors should avoid using a variety of drugs to treat each symptom, because some symptoms may be a side effect of another prescription drug. In some cases, it may be appropriate to avoid prescribing new drugs altogether, especially when the expected clinical outcome is unlikely to be achieved [17].

3.5. Identify and address treatment adherence barriers in older patients

There are several reasons for the decline of medication compliance in elderly patients: 1) Patients may have sensory defects, leading to poor communication. 2) Presbyopia and visual impairment increase with age, which can lead to misunderstandings and possibly endanger the patient's safety. 3) Patients sometimes acquiesce rather than acknowledge difficulties in understanding.

Patient errors can also lead to adverse drug events. In a 12-month follow-up study of 30,000 Medicare patients over age 65, 99 adverse drug events (23.5% of all adverse drug events) and 30 potential adverse drug events (13.6% of potential adverse drug events) were attributed to patient errors. The drugs most commonly involved are hypoglycemic drugs, cardiovascular drugs, anticoagulants, non-opioid analgesics and diuretics. Patients' errors mainly occurred in medication method, failure to follow clinical recommendations and self-modification of medication plan. Patient factors that increase the risk of errors include cognitive impairment and mental illness, as well as reduced vision and physical function. Errors

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are more likely in patients with complex medicine regimens [18].

In order to improve medication compliance, you can seek help from the patient's family members and keep the patient's medical records. Ask the patient to bring all the medicines they are taking now and observe what medicines they are actually taking.Comorbidities that cause compliance problems or unexpected adverse events are also considered.For instance, hand osteoarthritis occurs in 80% of older patients and can complicate opening medication bottles, splitting pills, picking up small pills, or self-injecting[14].

3.6. Periodically reassess the patient's medication list

Medication adjustment should not only take place at the time of prescription, but also as an ongoing process. The guidelines recommend that patients aged 75 years and older should have their polypharmacy reviewed annually, while those taking four or more drugs should be reviewed twice a year.Involve pharmacists more in prescribing advice and support patients and caregivers to improve consistency and adherence [6].Older patients often receive care from multiple providers and have transitions of care between hospital, home, an assisted living facility, or a nursing home. With each transition, there is potential for miscommunication of medication regimens.For example, if a patient on warfarin is started on a cephalosporin for a soft tissue infection, it is crucial to ensure that the patient has close anticoagulation monitoring.

3.7. Consider using biologics or small molecule drugs

In the elderly patients, the latest biologics and small molecule drugs may be safer options than traditional systemic drugs[19,20].If topical or traditional systemic drugs are ineffective, biologics and small-molecule drugs can be given priority.No dose adjustment is required for all available biologics, and although older adults have an increased risk of infection, there is no difference in safety between older and younger patients[21].Studies have shown that patients treated with biologics are more satisfied than those treated with nonbiologics[22].Long-term use of biologics in older adults is feasible because of their higher efficacy and minimal side effects, but their cost affects their sustainability[23].

4. Conclusions

General dermatologists must be prepared to care for an increasing number of older patients as the aging demographic increases.Dermatologists should be familiar with the pharmacodynamics and pharmacokinetics of common dermatological drugs, ask for detailed medical history and current drug use, and make a clear diagnosis.Then, according to the special physiological changes of elderly patients, drugs with definite curative effect, small adverse reactions and convenient administration should be selected, and unnecessary or redundant drugs should be minimized.Simultaneously simplify the medication regimen and avoid prescribing drugs with interactions. Provide counseling to patients and families to engage them in decision-making and improve medication adherence, thereby mitigating potential side effects.From external medicine to systematic medicine, start from low dose and gradually increase dosage, adjust drugs in time according to clinical efficacy and changes in liver and kidney function of elderly patients,negotiate reasonable expectations of treatment endpoint, and give priority to biological agents or small molecule drugs when conditions permit. This article discusses the problem of polypharmacy in the elderly in dermatology, and provides the principles and strategies of drug use in the elderly in dermatology.

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