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The Pharmaceutical Society of Hong Kong
The Practising Pharmacists Association of Hong Kong
The Society of Hospital Pharmacists of Hong Kong

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INSTRUCTIONS FOR AUTHORS

The Hong Kong Pharmaceutical Journal is a journal of the pharmacists, for the pharmacists and by the pharmacists. Submissions are welcome for the following sections:

- Pharmacy Education & Practice
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- Medication Safety
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- Society Activities
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Comments on any aspects of the profession are also welcome as Letter to the Editor.

There is no restriction on the length of the articles to be submitted. They can be written in English or Chinese. The Editorial Committee may make editorial changes to the articles but major amendments will be communicated with the authors prior to publishing.

It is preferable to have original articles submitted as an electronic file, in Microsoft Word, typed in Arial 9pt. Files can be sent to the following address:

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For detail instructions for authors, please refer to the first issue of each volume of HKPJ.

Embracing the Digital Era: The Evolution of our Journal

As announced in the previous issue (Volume 30, Issue 3), we are thrilled to introduce the launching of the website of *Hong Kong Pharmaceutical Journal* (www.hkpj.org), a significant milestone in the history of our journal. With this issue, we are bidding farewell to the traditional hard copy format and embracing the boundless potential of our newly launched website. This transition marks a pivotal moment in our journey, opening doors to a plethora of exciting possibilities and revolutionizing the way we disseminate knowledge.

As the world rapidly embraces the digital age, *Hong Kong Pharmaceutical Journal* must adapt and evolve to meet the changing needs and expectations of our readership. By shifting our focus to an online platform, our website provides an unparalleled level of accessibility for readers across the globe and fosters a more inclusive and global readership. In addition, the digital platform enables us to enrich articles with multimedia elements such as images, videos and interactive graphics. This dynamic approach can facilitate readers' comprehension and provide intricate concepts with greater clarity. Last but not the least, our website offers search functionalities, enabling readers to explore our vast archives effortlessly. With the integration of our online platform, articles published in the journal can now be seamlessly shared on social media, allowing them to reach a larger and more diverse audience.

In this issue, we continue our journey on "Conversations with pharmacy leaders in Hong Kong". We have Mr. William Chui as our guest. With more than three decades of experience in hospital pharmacy, William has been a driving force in promoting the role of pharmacists and advocating public education. During his tenure as the Pharmacy Department Manager of Queen Mary Hospital, he spearheaded significant reforms and introduced new clinical services, positioning the profession at the forefront of healthcare. In his interview, William shares his vision for the future of pharmacy, focusing on primary healthcare and hospital pharmacy. His insights and expertise are invaluable in shaping the future of pharmacy and healthcare in general. We are fortunate to have leaders like William who continue to make a positive impact on the profession and society.

Shirley Mok's article titled "Overview of the drug therapy of psoriatic arthritis" presents a comprehensive review of psoriatic arthritis. The article covers various aspects of the disease, including pathophysiology, clinical manifestations, diagnosis, treatment goals and management. The emergence of new pharmacological options targeting various mechanisms of action has expanded the range of treatment options available. By gaining a better understanding of the signs and symptoms of psoriatic arthritis and being able to select and monitor medications specific to each patient, pharmacists can significantly improve patients' health outcomes and overall quality of life.

With the introduction of the Primary Healthcare Blueprint by the Hong Kong Government, there is a significant shift taking place in the healthcare system. The traditional hospital-centric model is being transformed into a more balanced system that emphasizes the importance of primary care. This transformation has created a wealth of opportunities for pharmacists to contribute to the healthcare landscape. In the article "Primary care pharmacy - a review of current situation and future in Hong Kong," authored by Stephen So et al., the current state of primary care pharmacy in Hong Kong is examined and the potential avenues for future development are outlined. The article also addresses the potential challenges and barriers that may arise in this evolving field. By exploring these aspects, the article provides valuable insights for pharmacists and healthcare professionals involved in primary care, highlighting the importance of their role in advancing healthcare services in Hong Kong.

As we embark on this new chapter, we are excited about the possibilities that lie ahead. While we bid farewell to the tangible pages of our journal, we embrace a future filled with boundless opportunities for collaboration, innovation and knowledge dissemination. We are committed to ensuring that this transition is seamless and that our website becomes a vibrant hub for the exchange of ideas and intellectual growth.

We welcome your suggestions and feedback on any aspect of the Journal. You can contact me or other members of the Editorial Committee to share your thoughts on how we can enhance the Journal and make it more appealing to you, our valued readers. Your input is important to us, and we appreciate your continued support in helping us improve the Journal.

May PS Lam
Editor-in-Chief
28 April 2024

Prepared by Branson Fok & Candice Leung

Strengthening Sales Control of Codeine-containing Medicines Effective on January 26, 2024

Date: January 25, 2024

The Hong Kong government will publish the Pharmacy and Poisons (Amendment) Regulation 2024 on January 26th, 2024, to reinforce the sales control of codeine-containing medicines. The regulation will classify all medicines containing less than 0.2 percent of codeine as Part 1 Schedule 1 poisons under the Pharmacy and Poisons Regulations.

The Department of Health (DH) has expressed concern over the abuse of codeine-containing medicines in Hong Kong. Currently, medicines with 0.2 percent or more codeine are considered Part 1 Schedule 1 Schedule 3 poisons and can only be purchased at Authorized Sellers of Poisons (ASPs, commonly referred to as pharmacies) under the supervision of the registered pharmacist with a valid doctor's prescription. Medicines containing more than 0.1 percent codeine (but less than 0.2 percent) are classified as Part 1 Schedule 1 poisons, which can only be sold at ASPs under the supervision of the registered pharmacist, and require ASPs to register the purchaser's personal information (including the name, identity card number, address and signature) in the Poisons Book before sales completion.

Under the new regulation, to be effective on January 26th, 2024, medicines containing not more than 0.1 percent codeine will also be regarded as a Part 1 Schedule 1 poison, amending from the previous classification as a Part 1 poison. This strengthened control will require ASPs to comply with the additional requirement in the registration of the purchaser's personal information in the Poisons Book before finalizing the sale, while other current controls remain unchanged.

According to the Pharmacy and Poisons Ordinance, illegal sales of Part 1 poisons or prescription drugs is a criminal offense, with a maximum penalty of HKD100,000 and two years imprisonment for each offense. Pharmacies failing to comply with the requirement to make an entry in the Poisons Book before completing the sale of Part 1 Schedule 1 poison may face a maximum fine of HKD5,000.

Source: www.drugoffice.gov.hk

FDA Approves First Treatment to Reduce Risk of Serious Heart Problems Specifically in Adults with Obesity or Overweight

Date: March 8, 2024

The U.S. Food and Drug Administration (FDA) has recently expanded the approved indication of Wegovy (semaglutide) injections. Now, in addition to aiding weight loss, Wegovy is approved for a new indication in reducing the risk of cardiovascular death, heart attack, and stroke in obese or overweight adults with cardiovascular disease. It is recommended that Wegovy is used alongside a calorie-reduced diet and increased physical activity.

The active ingredient of Wegovy, semaglutide, is a glucagon-like peptide-1 (GLP-1) receptor agonist, and hence should not be combined with other drugs containing semaglutide or other GLP-1 receptor agonists.

Wegovy's efficacy and safety for the new indication were assessed in a multi-national, multi-center, placebo-controlled double-blind trial that involved more than 17,600 participants. Participants were randomly assigned to receive either Wegovy or a placebo, along with standard-of-care medical treatment (e.g. management of blood pressure and cholesterol) and healthy lifestyle counselling (including diet and physical activity). The result of the trial demonstrated that Wegovy significantly reduced the risk of major adverse cardiovascular events (cardiovascular death, heart attack, and stroke), which occurred in 6.5% of participants who received Wegovy compared to 8% of participants who received the placebo.

It should be noted that Wegovy contains a boxed warning about the potential risk of thyroid C-cell tumors. As such, patients with a personal or family history of medullary thyroid carcinoma or those with Multiple Endocrine Neoplasia syndrome type 2 should avoid using this medication.

Further warnings on Wegovy encompass risks like pancreatitis, gallbladder problems (including gallstones), hypoglycemia, acute kidney injury, hypersensitivity reactions, diabetic retinopathy, increased heart rate, and suicidal thoughts or behaviors.

The most common side effects of Wegovy include nausea, diarrhea, vomiting, constipation, abdominal pain, headache, fatigue, dyspepsia, dizziness, abdominal distension, belching, hypoglycemia in patients with diabetes, flatulence and gastroesophageal reflux disease (heartburn).

Source: www.fda.gov

FDA Approves Rezdiffra (Resmetirom) as First Treatment Option for Noncirrhotic Non-alcoholic Steatohepatitis with Liver Scarring

Date: March 14, 2024

Non-alcoholic Steatohepatitis (NASH) is commonly diagnosed during non-alcoholic fatty liver disease progression which may potentially lead to liver scarring and dysfunction over time. The disease is also found to have a strong association with chronic health problems including hypertension and type 2 diabetes. Currently, there is no specific medication indicated for NASH, and lifestyle modification is the suggested management method based on various guidelines.

Rezdiffra (Resmetirom) was approved by the U.S. Food and Drug Administration through the accelerated approval pathway on March 14th, 2024, for treating NASH with moderate to advanced liver fibrosis alongside diet and exercise in adults. Rezdiffra is a partial thyroid hormone receptor activation that exerts its pharmacological effect by reducing hepatic fat accumulation. It is also the first oral medication that demonstrates improvements in liver scarring among NASH patients.

Efficacy and safety evaluations of Rezdiffra were done based on the surrogate endpoints at month 12 in an ongoing 54-month, randomized, double-blind placebo-controlled trial involving 888 subjects with hepatic inflammation and moderate or advanced liver scarring due to NASH. Participants were randomly assigned to take 80 mg of Rezdiffra (n=298), 100 mg of Rezdiffra (n=296), or placebo (n=294) orally once daily in combination with lifestyle modification recommendations. A greater portion of participants receiving Rezdiffra treatment showed improvements in liver scarring or NASH resolution through liver biopsies 12 months after the first dose of Rezdiffra. Diarrhoea and nausea are the most common side effects observed during the trial. A post-approval study assessing Rezdiffra's clinical benefit is expected upon the completion of the same 54-month study.

Drug-induced liver toxicity and gallbladder-related side effects were stated as warnings and precautions regarding Rezdiffra usage. Patients with severe hepatic impairments or decompensated cirrhosis should refrain from taking Rezdiffra. Dosage adjustments and monitoring of statin-related side effects are recommended for patients taking both Rezdiffra and statins due to potential drug interactions.

The recommended dose of Rezdiffra ranges from 80 – 100 mg daily based on the patient's actual body weight and is to be taken once daily. The oral medication can be administered with or without food.

Source: www.fda.gov

Ribociclib plus Nonsteroidal Aromatase Inhibitor Prolongs Invasive Disease-free Survival in Patients with Early Stage Breast Cancer

Date: March 21, 2024

Hormone receptor (HR)-positive, human epidermal growth factor receptor 2 (HER2)-negative breast cancer is the most common subtype of breast cancer. The current treatment approach for early HR-positive, HER-2 negative breast cancer is surgical removal with or without radiotherapy or chemotherapy, followed by adjuvant endocrine therapy for 5 to 10 years. Ribociclib is a cyclin-dependent kinase 4 and 6 (CDK4/6) inhibitor indicated for patients with HR-positive, HER2-negative advanced breast cancer.

In the international and open-label phase 3 NATALEE trial, 5101 patients with HR-positive, HER2-negative early breast cancer were randomly assigned in 1:1 ratio to receive ribociclib (400 mg orally once daily for 21 days with 7 days off for 36 months) plus a nonsteroidal aromatase inhibitor (NSAI; either letrozole 2.5 mg or anastrozole 1 mg orally once daily) (n=2549) or NSAI monotherapy (n=2552) for 60 months. Men and premenopausal women in both groups also received subcutaneous goserelin 3.6 mg once every 28 days for gonadal suppression. The primary endpoint was invasive disease-free survival according to standardized definitions for efficacy endpoints (STEEP) criteria. Distant disease-free, recurrence-free, and overall survival were the secondary efficacy endpoints. Adverse events and serious adverse events were also monitored throughout the entire trial.

The second interim efficacy analysis for invasive disease-free survival at 3 years performed after 426 events of invasive disease, recurrence or death were higher in the ribociclib plus NSAI group (90.4%) compared with the NSAI monotherapy group (87.1%). The hazard ratio for invasive disease, recurrence, or death was 0.75 (95% confidence interval [CI], 0.62 – 0.91; P=0.003). Analysis on secondary efficacy endpoints in terms of distant disease-free and recurrence-free survival also demonstrated consistent results with primary findings. Reports of neutropenia (62.1% vs 4.5%) and liver-related events (25.4% vs 10.6%) were more prevalent in the ribociclib-NSAI group.

The prespecified interim analysis of the NATALEE trial showed a significantly lower risk of invasive disease, recurrence, or death in patients with early-stage HR-positive, HER2-negative breast cancer treated with adjuvant ribociclib-NSAI regimen.

Source: www.nejm.org

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Programme Code: HS208A

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Conversations with Pharmacy Leaders in Hong Kong (2) – The Future of Pharmacy: Promoting the Roles of Pharmacists, Primary Healthcare and more

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ABSTRACT

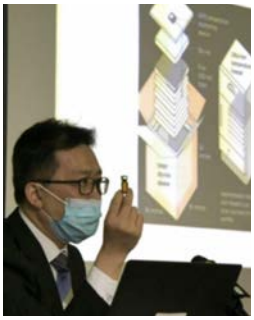
Mr. William Chui, the newly appointed Chief Pharmacist of the Hospital Authority, has always been actively promoting the role of pharmacists and advocating public education. With over 30 years of experience in the field of hospital pharmacy, during his term of office as the Pharmacy Department Manager of Queen Mary Hospital, he took the lead in reforming the profession and developing new clinical services. In this interview, William opens up on his view of the future of pharmacy, including primary healthcare, hospital pharmacy, and more.

Keywords: *Patient Empowerment, Primary Healthcare, Clinical Pharmacy, Ambulatory Pharmacy*

When asked about his thoughts on the pharmacy profession, William summarized it into one simple sentence: to ensure that the general public understands the role and importance of a Pharmacist, and values the profession in the healthcare industry. To be exact, the societal value of the pharmacist is not just about dispensing medication, but providing people-centered pharmaceutical care and empowering patients, which can eventually improve therapeutic outcomes and quality of life.

Information is Power

William sees drug education and empowerment as a major role of pharmacists. In the past, the old mindset of healthcare professionals was to inform patients of their treatment regimen and hope that they believe the information shared. A territory-wide survey revealed that the majority of patients consulting practitioners are not aware that they participate in the decision of their drug treatment with their practitioners. In fact, patients were only passively following the assigned treatment regimen without a good understanding of their medication and the expected therapeutic outcome.



William believes "information is power." In 2002, he worked with fellow members of the Society of Hospital Pharmacists of Hong Kong (SHPHK) to establish the Drug Education Resources Centre (DERC). Apart from drug information, DERC also provides disease-related and general health information to the general public, so that people can engage in their therapy and enhance self-management. Some people think that "self-management" is equivalent to purchasing medicines at pharmacies by themselves, but actually patient empowerment can achieve more. After knowing the signs and symptoms of minor ailments, people can take the initiative to modify their lifestyles and monitor disease progress. Also, by

improving the drug knowledge of patients, they can ask appropriate questions during follow-ups and actively participate in the decision-making process with doctors. When patients are engaged in the therapy, they are more likely to adhere to their drug treatment. As a result, education can increase public health awareness and improve the safety and efficacy of treatment.

However, this poses the question: how can pharmacists efficiently and effectively share drug information with the whole society? At the moment, drug counseling and drug talks are the major way for pharmacists to empower patients. These channels only allow pharmacists to reach a limited amount of audience. William thinks that by utilizing the media, health information and knowledge can be delivered to a much wider audience.

For instance, during the COVID-19 outbreak, there was widespread information on the internet and media regarding vaccines. The general public may be confused regarding which vaccine to choose and whether an additional booster is necessary. During the pandemic, William quickly recognized and addressed public concerns by providing professional advice through media and press releases. For instance, William advocated the use of one-third of the adult dose of BioNTech in children and the importance of receiving a 3rd dose as a booster for longer protection from COVID-19. This experience proved that the media is a powerful tool to empower citizens to make informed decisions and promote the role of pharmacists.

Providing Pharmaceutical Care and Patient-Centered Services

In a hospital setting, doctors provide medical care, nurses provide nursing care, and pharmacists provide pharmaceutical care. Due to the nature of the healthcare system, a patient's consultation time with doctors is often very short. The introduction of Ward and Ambulatory Pharmacy Services in the Hospital Authority can fill the gap. Currently, there are Ward Pharmacist Services to review patients' medication profiles at admission and before discharge. There are also Ambulatory Pharmacist-led Clinics for stable patients with chronic diseases. During consultation, Clinical Pharmacists help review treatment outcomes, manage side effects of drug treatment, and assess patient adherence.

After implementation, there is positive feedback from patients and doctors. Clinical Pharmacists can assist in identifying and solving drug-related problems, so doctors can focus more on diagnosis and disease monitoring, which enhances the quality of care in terms of safety, efficacy, and quality of life.

In addition, Telepharmacy is another successful clinical pharmacy service started during COVID-19. After receiving Tele-diagnosis by doctors, patients can receive pharmacist counseling via video conference. Patients are highly satisfied with Telepharmacy services as it saves traveling time and addresses patients' drug-related problems promptly. The service is beneficial to patients with disability and carers as they can join the consultation easily. After the pandemic, patients can still arrange Telepharmacy services between doctor follow-ups, so pharmacists can check in and review a patient's medication regimen and collaborate with doctors to make changes where necessary. For example, a Clinical Pharmacist can view laboratory results of a patient to understand his/her treatment effects and disease progress, check whether the patient is experiencing medication side effects, and offer advice on how to manage the side effects.

As the former Pharmacy Department Manager at Queen Mary Hospital, a teaching hospital, William felt the need to constantly develop and improve Clinical Pharmacy Services.

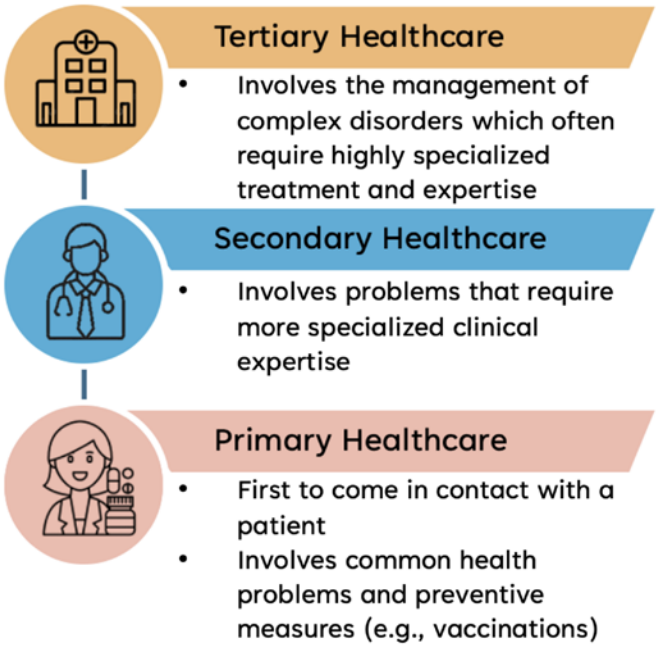
He proposed that Pharmacist-led Clinics can be extended to other clinical areas, such as a Drug Allergy Clinic. Clinical Pharmacists can gather necessary information and conduct a full drug allergy test to assess whether the patient has a true allergy to a specific drug. Currently, β-lactam antibiotics are widely used as the empirical treatment for infections, but β-lactams are also frequently associated with drug allergy. According to the Hong Kong Drug Allergy De-labelling Initiative, 1 in 50 people were documented to have β-lactam allergies. However, a large proportion of the recorded allergies were found to be inaccurate after a full drug allergy test. With incorrect allergy labeling, a patient's antibiotic choices become limited, which can negatively impact therapeutic outcomes and patients' health. In the proposed clinic, a Clinical Pharmacist would be able to perform drug allergy testing, assess the severity of the allergy, and log the allergy into the patient's profile. Also, Clinical Pharmacists can work with physicians to determine whether a re-challenge is safe based on the allergy severity and oversee the whole re-challenge process. By updating allergy profiles and removing unnecessary allergy labels, patients are open to more treatment options, and thus ensure appropriate use of antibiotics.

With many of the pharmacy service initiatives mentioned by William, collaboration between healthcare professionals appears to be evident. In the case of the Allergy Clinic, Clinical Pharmacists would consult with the patients individually and collaborate with doctors when deciding whether a patient should rechallenge a certain medication. For Telepharmacy, Clinical Pharmacists can consult with patients in between follow-ups, which allows the Clinical Pharmacist to share expert drug advice with doctors, and work together to make changes to treatment regimens where necessary. Clinical Pharmacists can make use of their expertise to ensure safe medication use.

Future Direction of the Pharmacy Profession

William believes Primary Healthcare is the future direction for Hong Kong's healthcare system and the pharmacy profession. In the model of care, primary healthcare acts as the first point of contact for the general public. Primary healthcare is responsible for public education, screening and prevention of diseases, and quick referrals to secondary care providers. Secondary care focuses

more on problems that require more specialized clinical expertise (e.g. hospital care), whereas tertiary care involves the management of more complex disorders that require highly specialized treatment and expertise.



As a result, doctors and hospital pharmacists can focus on treating advanced complicated cases, while community pharmacists can be part of primary healthcare by empowering the general public and managing minor ailments. Holistic care starts with disease prevention. By promoting lifestyle modification and early screening, there is better disease prognosis and thus effectively reducing the healthcare burden, which benefits the general public, as well as all parties in the healthcare system.

Apart from primary healthcare, William believes that public-private partnerships or the "Co-Care" concept can be the future of Pharmacy. The public and private sectors should work together to share the healthcare burden. For example, stabilized patients from public hospitals could be transferred to Family Doctors for further management in the community. The same concept can be applied to pharmaceutical care. We should make better use of Community Pharmacists, who can act as "Family Pharmacists". Given the increasing tobacco tax, smoking cessation programmes may become a major Community Pharmacist service. Another possible role is to be a Medication Review Pharmacist for old-aged home residents. Elderly often suffer from polypharmacy, leading to increased risk of medication incidents. Community Pharmacists can conduct regular visits and medication reviews to ensure safe drug use in residential care homes.

It is Just the Beginning

In the interview, William shared many possible directions for the development of Pharmaceutical Care, namely public-private collaboration and community pharmacy services. He hopes to expand pharmaceutical services in order to reach out to the general public and promote the roles of pharmacists.

As the newly appointed Chief Pharmacist of the Hospital Authority, William highlighted three areas as his top priorities: promoting the safe and judicious use of drugs, developing and expanding Clinical Pharmacy Services (Ward and Ambulatory Pharmacists), and strengthening collaboration between hospital pharmacies and primary healthcare providers to provide holistic care for Hong Kong people. He added, "It is just the beginning".

Author's background

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Overview of the Drug Therapy of Psoriatic Arthritis

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ABSTRACT

Psoriatic arthritis is an inflammatory disease associated with psoriasis, with an estimated prevalence of psoriatic arthritis among patients with psoriasis ranging from 4% and 30% in global population. Clinical manifestations include joint involvement, nail changes, enthesitis and dactylitis. The choice of pharmacological therapy depends upon clinical presentation. For patients with mild musculoskeletal symptoms, NSAIDs can be used. Disease-modifying anti-rheumatic drugs (DMARDs) should be employed for polyarthritis and more severe cases. Conventional DMARDs and biologic DMARDs are both proven efficacious in psoriatic arthritis. Recently, numerous DMARDs have been developed with promising results. The choice of drug therapy is discussed in this article.

Keywords: *Psoriatic arthritis, Disease-modifying anti-rheumatic drug, Tumor necrosis factor inhibitor, Interleukin inhibitor, Biologic DMARD*

INTRODUCTION

Psoriatic arthritis (PsA) is an inflammatory disease associated with psoriasis. It comprises both musculoskeletal and non-musculoskeletal manifestations, where the latter includes skin and nails, and potentially guts and eyes. PsA affects men and women equally.[1] Active chronic PsA is also associated with cardiovascular, psychological and metabolic comorbidities, which together with the musculoskeletal symptoms, impose a significant patient burden with impact on quality of life and accelerated mortality.[1] Estimates of the prevalence of PsA among patients with psoriasis have ranged from 4 to 30%.[1] Early identification of PsA and early initiation of therapy are important for improving long-term outcomes. This article provides an overview of the disease and summarizes the drug treatments for PsA.

PATHOPHYSIOLOGY

The pathophysiology of PsA involves a complex interaction between genetic, immunologic, and environmental factors. Five percent of first-degree relatives of patients with PsA will develop an inflammatory arthritis.[2] Although the exact genetic mechanisms are not known, human leukocyte antigen alleles within the major histocompatibility complex have been strongly implicated. Psoriatic arthritis shares similar disruptions to the immune system as other immune-mediated inflammatory diseases (e.g., rheumatoid arthritis, Crohn's disease). These diseases involve immune-pathologic features, including neutrophil infiltration, CD4+ lymphocytes, CD8+ T-cells and multiple inflammatory cytokines (e.g., interleukin (IL)-6, IL-12, IL-17, IL-23), and tumor necrosis factor (TNF) in the synovial tissue and synovial fluid.[3] Some environmental factors are suspected to be associated with PsA, including skin trauma and infections.[4]

CLINICAL MANIFESTATIONS AND DIAGNOSIS

Psoriatic arthritis is an inflammatory seronegative spondyloarthropathy. It is estimated that patients have cutaneous manifestations for an average of 12 years before onset of PsA.[5] Given a heterogeneous disease, clinical manifestations include peripheral joint and axial skeleton involvement, nail changes, enthesitis, tenosynovitis, and dactylitis. Patients may present with one or more of these symptoms and arthritis may be monoarticular (involving a single joint), oligoarticular (involving 1 to 4 joints), or polyarticular (involving many joints).

Diagnosis of PsA involves physical examination of affected joints, nail and skin changes, imaging like X-ray to show joint damage and blood tests to assess ESR, rheumatoid factors and anti-CCP antibodies. Various classification systems are developed to help identify PsA. Two commonly used classification systems for diagnosis of PsA are Classification of Psoriatic Arthritis (CASPAR) criteria and Moll and Wright criteria. CASPAR criteria are a set of diagnostic rules that could be used to classify PsA patient. To meet the criteria, a patient must have inflammatory articular disease, and score at least 3 points from the following list of features: current psoriasis (assigned a score of 2; all other features were assigned a

score of 1), a history of psoriasis (unless current psoriasis was present), a family history of psoriasis (unless current psoriasis was present or there was a history of psoriasis), dactylitis, juxtaarticular new bone formation, negative rheumatoid factor, and nail dystrophy.[6] Moll and Wright criteria are the original criteria used and is still commonly used. The diagnosis of psoriatic arthritis requires negative serology for rheumatoid factor plus 1 of the following 5 subtypes: Polyarticular symmetric arthritis, Oligoarticular (< 5 joints) asymmetric arthritis, Distal interphalangeal joint predominant arthritis, Spondylitis predominant arthritis and Arthritis mutilans.[7] A comparative study demonstrates that the sensitivity of CASPAR criteria and Moll and Wright criteria is 91.7% and 85.8% respectively.[8]

TREATMENT GOALS AND COMMON ENDPOINT

The primary goal of treating patients with PsA is to maximize health-related quality of life, through (1) control of symptoms; (2) prevention of structural damage; and (3) normalization of function and social participation. Abrogation of inflammation is an important component to achieve these goals.[9]

Therapeutic decisions are needed to be individualized and made jointly by doctor and patient. Treatment choices may be affected by various factors, including disease activity, previous therapies, prognostic factors such as structural damage, comorbid conditions and patient factors such as cost and convenience.[10]

A general approach to managing patients with PsA is summarized in European League Against Rheumatism (EULAR) guideline 2019 **(Figure 1)**.[9] In EULAR guideline 2019, it is recommended that patients with polyarticular disease should receive a csDMARD (methotrexate, leflunomide, sulfasalazine) either as first-line drug or only after a short course of NSAIDs. Polyarticular disease is defined as 5 or more swollen joints.

In patients with peripheral arthritis and an inadequate response to at least one csDMARD, a biological DMARD (bDMARD) should be considered. bDMARDs are biologic agents that aim at different cytokines such as TNF, IL-17, IL-12/IL-23, IL-23 as well as targeted synthetic DMARD (tsDMARD) that inhibit phosphodiesterase-4 (PDE-4) or Janus kinases (JAKs).[9] Currently, for the RCTs reviewed for PDE4i, TNF inhibitors, IL-17 inhibitors, IL-12/23 inhibitors, IL-23 inhibitors and JAK inhibitors, there were no differences in efficacy for these treatment options in subgroups of patients with or without csDMARDs.[10]

Multiple outcome measures may be used to evaluate effectiveness of treatments in PsA. Examples include arthritis response, skin severity, patient function and quality of life.[11] The PsA arthritis response is commonly assessed with the American College of Rheumatology (ACR) response criteria. The ACR response criteria are a set of measures that include tender joint count, swollen joint count and five additional core set measures: physician

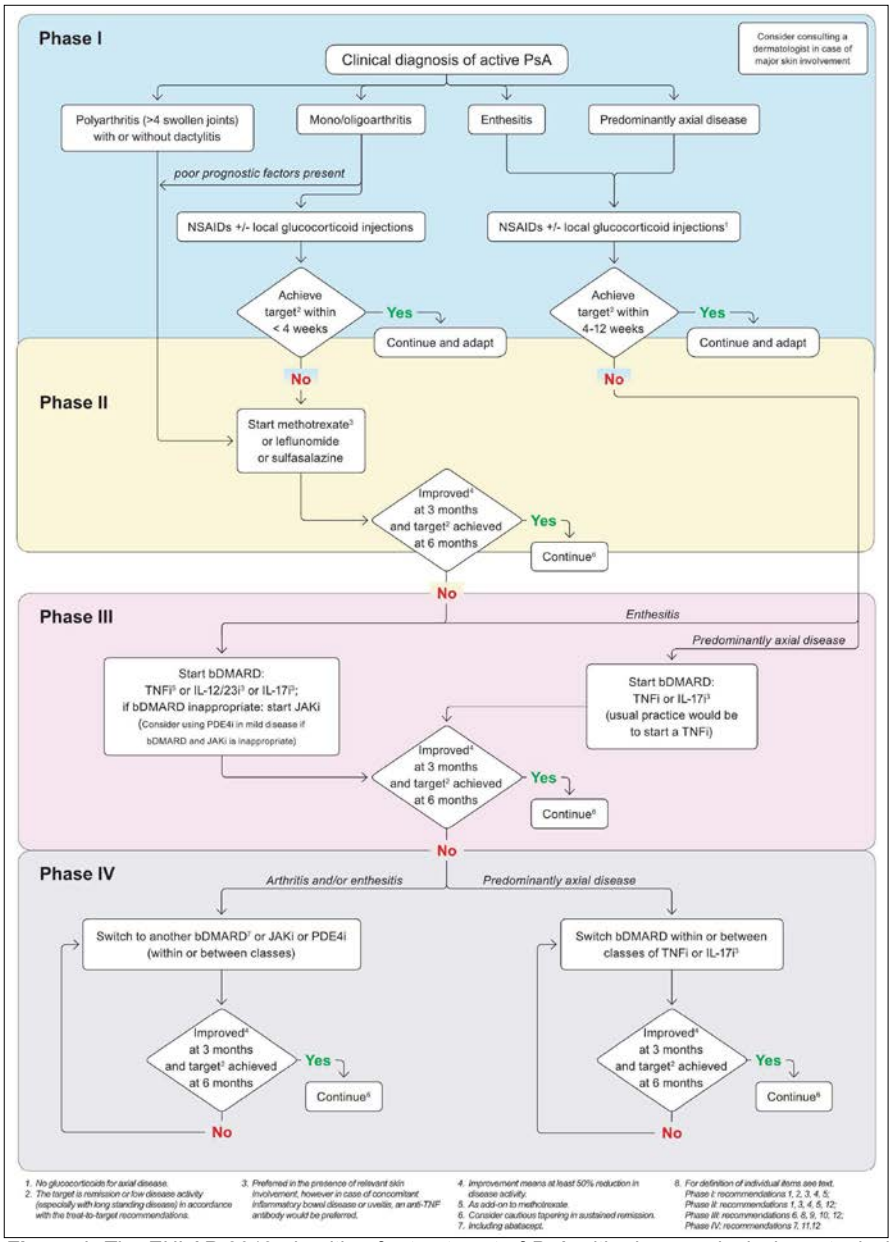

***Figure 1**: The EULAR 2019 algorithm for treatment of PsA with pharmacological non-topical treatments*

assessment of disease activity, patient assessment of disease activity, pain, physical function, and levels of an acute-phase reactant (referring to either CRP level or ESR).[11] An ACR20 response is defined as at least 20% improvement in both the tender joint and swollen joint count and at least 20% improvement in 3 of the 5 core set measures. Some studies also use ACR 50 and ACR70 as outcomes measurements (i.e., 50% or 70% improvement in the ACR response criteria respectively). Common outcome measures used to assess drug response in PsA trials are shown in **table 1**.[11]

Table 1. Selected Outcome Measures in Psoriatic Arthritis

Category	Outcome Measure(s)
Arthritis Response	• American College of Rheumatology (ACR) response criteria • Psoriatic Arthritis Response Criteria (PsARC)
Skin Severity	• Psoriasis Area and Severity Index (PASI)
Patient Function and Quality of Life	• Health Assessment Questionnaire - Disability Index (HAQ-DI) • Short Form-36 health survey (SF-36)

Different drug therapies for PsA treatment will be discussed in the following sections.

THERAPEUTIC AGENTS – NSAID

Non-steroidal anti-inflammatory drugs may be used to relieve musculoskeletal signs and symptoms.[9] The benefit to risk ratio of NSAIDs must always be considered carefully, especially in this population with frequent cardiovascular comorbidities.[9]

For patients with mild synovitis in PsA or axial symptoms, NSAIDs alone may be sufficient to control symptoms.[9] In patients with active peripheral arthritis, NSAIDs should be combined rapidly with DMARDs if needed. NSAID monotherapy should not exceed 1 month if disease activity persists, and other treatment possibilities should be considered.[9]

THERAPEUTIC AGENTS – GLUCOCORTICOIDS

As recommended in EULAR 2019 guideline, local injection of glucocorticoids should be considered as adjunctive therapy in mild PsA for symptomatic control. For systemic glucocorticoids, it may be used with caution at the lowest effective dose and for a short period of time.[9] A systematic review indicates that systematic glucocorticoids are frequently prescribed for PsA patients, and the use of systemic glucocorticoids should be considered if a patient needs rapid anti-inflammatory therapy.[12] However, in 2023, EULAR has announced the removal of the use of systemic glucocorticoids from its recommendations for the management of psoriatic arthritis.[13]

THERAPEUTIC AGENTS – CONVENTIONAL DMARDS

Conventional DMARDs (csDMARDs), including methotrexate, leflunomide and sulfasalazine, are recommended in the management of PsA as first-line DMARDs.

Methotrexate (MTX) is a folate antimetabolite that inhibits DNA synthesis, repair and cellular replication. This drug has a labeled indication for treatment of psoriasis but not for PsA. Although it is commonly recommended as the first-line csDMARD, data supporting its efficacy is limited. 'SEAM-PsA' study (n=851) evaluates the efficacy of MTX monotherapy, etanercept monotherapy, or methotrexate/etanercept in combination for early PsA. At week 24, ACR20 response rates were significantly greater in etanercept monotherapy compared to MTX monotherapy (60.9% versus 50.7%, p=0.029).[14] Another RESPOND study, an open-label comparison of MTX and combination therapy of infliximab plus MTX , shows clear superiority of infliximab plus MTX group in achieving ACR20 response rate at week 16 when compared to MTX group (86.3% vs 66.7%, p<0.02).[15] Although efficacy might be inferior to newer targeted therapies, both low cost and widespread availability are important factors that contribute to the prominent role of MTX in treatment of PsA. Targeted dose of MTX should be 25mg per week with folate supplementation.

Leflunomide is an immunomodulatory agent that inhibits pyrimidine synthesis, resulting in anti-proliferative and anti-inflammatory effects. A double-blind, randomized, placebo-controlled trial (n=190) studies the efficacy of leflunomide (100mg/day for 3 day follow by 20mg/day) versus placebo in PsA patients. At week 24, leflunomide showed better response with a higher PsARC rate when compared to placebo (59% leflunomide vs 30% placebo, p<0.0001).[16] Major safety concerns with leflunomide include hypertension, diarrhea, nausea, and hepatotoxicity. The dosage of leflunomide is 20mg daily orally.

Sulfasalazine contains 5-aminosalicylic acid (5-ASA) as the active component. While the specific mechanism of action is unknown, it is suggested that it modulate local chemical mediators of the inflammatory response. A retrospective cohort study (n=187) showed that for DMARD-naïve PsA patient prescribed csDMARD as monotherapy, MTX performs better than sulfasalazine

with respect to drug retention (median 34.5months for MTX, 12 months for sulfasalazine).[17] Major adverse reactions include GI side effects, blood dyscrasia and delayed hypersensitivity. The usual dose of sulfasalazine is 2-3g per day in divided doses.

THERAPEUTIC AGENTS – BIOLOGICAL DMARDs

Tumor Necrosis Factor inhibitors (TNFi)

Tumor Necrosis Factor inhibitors (TNFi), including etanercept, infliximab, adalimumab, certolizumab pegol and golimumab, have been the mainstays of moderate to severe PsA treatment. TNF inhibitors block interaction of TNF with cell surface receptors to block pro-inflammatory cytokines. These agents are recommended for patients who have had inadequate response to non-biologic DMARDS. Under American College of Rheumatology/ National Psoriasis Foundation (ACR/NPF) Guideline (2018) for the Treatment of PsA, TNFi is recommended over an oral small molecule (OSM) as a first-line agent.[18] Group for Research and Assessment of Psoriasis and Psoriatic Arthritis (GRAPPA) treatment recommendation (2021) also stated that data supported the superiority of TNFi over csDMARDs as first-line therapy, particularly in patients with early disease, mainly due to the higher efficacy achieved by TNFi as observed in studies.[10] Major adverse effects of TNFi include injection site reactions, infusion reactions, increased risk of infection, increased risk of malignancies and heart failure.

Etanercept is a human TNFi, the first of the class approved by FDA in 2002 for PsA. There are 2 double-blinded, placebo-controlled RCTs of etanercept in adults with active PsA, namely Mease 2000 (n=60) and Mease 2004 (n=205).[19,20,21] In both trials, patients with active PsA not responding adequately to NSAIDs were randomized to receive 25 mg etanercept subcutaneously every 2 weeks and placebo. The primary outcome in the Mease 2000 trial was Psoriatic Arthritis Response Criteria (PsARC) at week 12, with 87% of etanercept patients achieving PsARC compared to 23% in placebo group.[20] In Mease 2004, etanercept showed a significantly better ACR20 response compared to placebo (59% vs 15% placebo, p<0.0001); the results were sustained at 24 and 48 weeks.[21] Etanercept is administered subcutaneously as a 50mg once weekly or 25mg twice weekly injection.

Golimumab is a human monoclonal antibody that prevents the binding of TNF to its receptors. It is FDA approved for treatment of psoriatic arthritis in patients ≥ 2years old in 2009. Based on a randomized trial GO-REVEAL(n=405), patients with PsA were randomized to receive subcutaneous golimumab 50mg every 4 weeks, 100mg every 4 weeks and placebo. At week 14, both treatment arms showed significantly better ACR20 response compared to placebo (51% for 50mg, 45% for 100mg, 9% placebo, p<0.001 vs placebo).[22] In a follow-up trial, the efficacy was maintained at 1 year.[23] Efficacy of IV golimumab is demonstrated in GO-VIBRANT trial (n=480). PsA patients receiving golimumab (2mg/kg IV at week 0,4,12,20) and placebo were compared at week 14. IV golimumab is associated with better outcomes, including ACR20 response (75.1% vs 21.8%, p<0.001), ACR 50 response (43.6% vs 6.3%, p<0.001), ≥ 75% improvement by PASI in 59.2% vs. 13.6% (p < 0.001) in subgroup with ≥ 3% body surface area involvement at baseline.[24] A follow-up study demonstrated a high ACR20 response rate for up to 1 year (77%), with discontinuation rate due to adverse events standing at 3.7% overall.[25] Golimumab is available as IV and subcutaneous formulation. Subcutaneous route is only licensed for adult use. For subcutaneous route, the recommended dose is 50mg once a month. For IV route, it is administered as 2mg/kg at week 0, 4, then every 8 weeks.

Adalimumab is a recombinant monoclonal antibody that binds to TNF and neutralizes its function. It is FDA approved for treatment of psoriatic arthritis in 2005. Efficacy of adalimumab is demonstrated in a RCT Genovese 2007 (n=100), where adalimumab was superior to placebo in terms of ACR20 response rate (39% vs 16%, p=0.012), ACR50 (25% vs 2%, p<0.001), ACR70 (14% vs 2%, p<0.05) and PsARC (51% vs 24%, p=0.007).[26] A more recent study ,EXCEED trial (n=853) in 2020, evaluated the efficacy and safety of secukinumab versus adalimumab; results showed that at week 52, ACR20 response was comparable between two drugs (secukinumab 67% vs. adalimumab 62%), and adverse events were 77% vs. 79% respectively (no p value reported).[27] The recommended dose for adalimumab is 40mg every 2 weeks.

Certolizumab pegol is a pegylated humanized antibody Fab fragment of TNF monoclonal antibody. Pegylation of certolizumab allows delayed elimination and therefore an extended half-life. It was FDA approved for treatment of active PsA in 2013. In RAPID-PsA trial (n=409), PsA patients were randomized to certolizumab 400mg once every 4 weeks, 200mg once every 2 week and placebo. The ACR20 response at 12 weeks was significantly higher in certolizumab groups versus placebo (51.9% in 400mg, 58% in 200mg, 24.3% with placebo, p<0.001). Better ACR20 response at 24 weeks (p<0.001 vs placebo), ACR50 response at 12 and 24 weeks (p ≤ 0.001 vs placebo) were also observed for both certolizumab groups. Treatment-emergent adverse

events were comparable (71.1% with 400mg, 68.1% with 200mg, 67.6% with placebo, no p value reported).[28] The dosage of certolizumab is 400mg SC at week 0,2,4, followed by maintenance dose of 200mg every 2 weeks or 400mg every 4 weeks.

Infliximab is a chimeric human-murine monoclonal antibody that inhibits the functional activity of TNF-alpha. It was FDA approved in 2005 for PsA. In IMPACT 2 trial (n=200) which compared infliximab and placebo in PsA patients unresponsive to conventional treatment, infliximab achieved a better ACR20 response at week 14 compared to placebo (58% vs 11%, p<0.001). Infliximab group also showed significantly better results than placebo group in terms of ACR50 at 14 weeks (36% vs 3%), ACR 70 at 14 weeks (15% vs 1%) and PsARC met at 14 weeks (77% vs 27%).[29] Another trial RESPOND comparing infliximab plus methotrexate versus methotrexate in methotrexate-naïve patients showed that combination therapy is associated with better ACR20 response rate at week 16 (86.3% vs 66.7%, p<0.02).[15]

The recommended route of infliximab administration is IV. The recommended dosage is 5mg/kg at 0, 2, 6 weeks, followed by 5mg/kg every 8 weeks.

IL-12/23 INHIBITORS

Ustekinumab is a human monoclonal antibody that inhibits IL-12 and IL-23 cytokines. IL-12 and IL-23 are naturally occurring proinflammatory cytokines that are involved in natural killer (NK) cell activation, CD4+ T-cell differentiation and activation. Ustekinumab is FDA approved for treatment of PsA in 2013. The safety and efficacy of Ustekinumab are supported by 2 trials, PSUMMIT 1 and PSUMMIT 2. In PSUMMIT 1 (n=615), patients with active PsA for ≥6 months with no prior biologic anti-TNF therapy were randomized to ustekinumab 45mg, 90mg and placebo. At week 24, the ACR20 response rates in both treatment arms were significantly higher when compared to placebo (45mg group 42.4%, 90mg group 49.5%, placebo 22.8%, p<0.0001 vs placebo). Treatment responses were maintained at 1 year, while no significant differences in adverse events were found between groups at week 16.[30] In PSUMMIT 2 trial (n=312), the patients enrolled had ≥ 3 months of DMARDs, ≥ 4 weeks of NSAIDs, and/or ≥ 8 continuous weeks of biological anti-TNF therapy. The study arms included ustekinumab 45mg, 90mg, and placebo. A significantly higher proportion of patients on ustekinumab achieved ACR20 response at week 24 (45mg group 43.7%, 90mg group 43.8%, placebo 20.2%, p<0.001 versus placebo).[31] Common side-effects include arthralgia, asthenia, diarrhea, nausea and vomiting. The major safety concerns of ustekinumab include an increased risk of infections and hypersensitivity reaction. Ustekinumab may increase the risk of malignancy but data are conflicting.[32] The recommended dose is subcutaneous injection 45mg at 0 and 4 weeks, then 45mg every 12 weeks. For patients with coexisting moderate-severe plaque psoriasis weighing >100kg, administer 90mg SC at week 0 and 4, followed by every 12 weeks. Some patients with inadequate response may require maintenance dosing every 8 weeks.

IL-23 INHIBITORS

Interleukin (IL)-23 inhibitors are monoclonal antibodies that bind and inhibit cytokine IL-23, a proinflammatory cytokine. The IL-23 inhibitors approved by FDA for use in PsA are guselkumab (2020) and risankizumab (2022). Their approval provides more therapeutic choices for patient with PsA. Common adverse events associated with the use of IL-23 inhibitors include risk of infections (include upper respiratory tract infection), arthralgia, diarrhea, headache, hypersensitivity reaction and elevated liver enzymes.

Guselkumab is a monoclonal antibody that inhibits inflammatory and immune responses by selectively binding and inhibiting the p19 unit of IL-23. The efficacy of guselkumab is based on 2 trials DISCOVER-1 trial (n=382) and DICSOVER-2(n=741). Patients in both trials were randomized to receive placebo, guselkumab 100mg at week 0, 4 then every 8 weeks, and guselkumab SC 100mg every 4 week. In DISCOVER-1 which involved PsA patients who were either naive to biologic DMARDs or had had previous TNF inhibitor treatment, results showed that guselkumab treatment arms were associated with better ACR20 response at week 24 (59% in guselkumab Q4W, 52% in guselkumab Q8W, 22% placebo, p<0.0001 vs placebo respectively).[33] In DISCOVER-2, recruited patients were naïve to biologic DMARDs. Again both gulsekumab treatment arms achieved a significantly higher ACR20 response rate at week 24 (64% Q4W, 64% Q8W, 33% placebo, p<0.0001 vs. placebo).[34] Guselkumab is administered as subcutaneous injection of 100mg at week 0, 4 and every 8 weeks. A maintenance dose of 100mg every 4 weeks may be considered in patients at high risk of joint damage.[35]

Risankizumab is a humanized monoclonal antibody that binds selectively to interleukin-23. The efficacy of risankizumab for treating active PsA was established in two trials, KEEPsAKE 1 and KEEPsAKE 2. In KEEPsAKE 1, patients with active PsA who have responded inadequately or are intolerant to ≥1 csDMARD were included in the trial, while for KEEPsAKE 2 study, PsA patients with a history of inadequate response or intolerance to csDMARDs and/or bDMARDs were

recruited. Both studies evaluated the efficacy and safety of Risankizumab 150mg versus placebo over 24weeks, with a long-term extension for up to additional 204 weeks. In KEEPsAKE1, risankizumab treatment achieved a significantly better ACR20 response at week 24 when compared to placebo (57.3% vs 33.5%, p<0.001). It also demonstrated a significantly better response in ACR50 (33.4% vs 11.3%, p<0.001) and PASI 90 response (52.3% vs. 9.9%, p < 0.001).[36] In KEEPsAKE2, again a greater proportion of patients in risankizumab group achieved ACR20 response at week 24 (51.3% vs 26.5%, p<0.001).[37] The recommended dosage is 150 mg subcutaneously at week 0, week 4, and every 12 weeks.

IL-17 INHIBITORS

Interleukin (IL)-17 inhibitors are monoclonal antibodies that bind and inhibit cytokine IL-17, thereby blocking the inflammatory pathway of IL-17. The IL-17 inhibitors approved by FDA for PsA include secukinumab (2016) and ixekizumab (2017). Common adverse events associated with the use of IL-17 inhibitors include upper respiratory infections, arthralgia, diarrhea, headache, tinea infections and herpes simplex infections. Under EULAR recommendation (2019), in patients with peripheral arthritis with inadequate response to ≥1 csDMARD and relevant skin involvement, IL-17 inhibitors may be preferred over TNF inhibitors.[9]

Ixekizumab is a humanized monoclonal antibody that selectively binds to interleukin 17A (IL-17) cytokine and inhibits its interaction with IL-17 receptor, thereby inhibiting the release of proinflammatory cytokines and chemokines. In SPIRIT P2 trial (n=363), patients with active PsA who were intolerant or had inadequate response to TNF inhibitors were randomized to ixekizumab 80mg SC every 4 weeks, ixekizumab 80mg SC every 2 weeks and placebo. Both ixekizumab treatment arms achieved significantly better ACR20 response (53% for Q4W, 48% for Q2W, 20% placebo, p<0.0001 vs placebo) and ACR50 response (33% for Q4W, 35% for Q2W, 5% placebo, p<0.0001 vs placebo) at week 24. Ixekizumab groups were also associated with improved PASI 75 in patients with psoriasis in ≥ 3% of body surface area at baseline.[38] Dosing of Ixekizumab is 160 mg subcutaneously at week 0, followed by 80 mg every 4 weeks.

Secukinumab is a recombinant humanized monoclonal antibody that selectively binds to interleukin 17A (IL-17). Efficacy of secukinumab is evaluated in 2 major trials, FUTURE-1 and FUTURE-2. Patients with previous treatment including NSAIDs, csDMARDs, or TNF inhibitors were included. FUTURE-1 (n=606), patients were randomized to IV secukinumab 10mg/kg at week 0, 2, 4, followed by either subcutaneous secukinumab 150mg or 75mg every 4 weeks or placebo. Results showed that secukinumab groups achieved significantly better ACR20 response at week 24 (50% 150mg, 50.5% 75mg, 17.3% placebo, p<0.001 vs placebo), with sustained improvement at week 52.[39] In FUTURE 2 trial (n=397), patients were randomized to subcutaneous secukinumab 300mg, 150mg, 75mg and placebo respectively for once weekly for 5 weeks followed by every 4 weeks. At week 24, significantly better ACR20 response rates were achieved in secukinumab 300mg and 150mg group (54% and 51%, p<0.0001 vs placebo), but not in 75mg group.[40]

Another study EXCEED trial comparing efficacy of secukinumab and adalimumab without concurrent use of csDMARD showed that two drugs achieved a similar ACR20 response rate at week 52 (67% vs 62%), while secukinumab showed a better PASI90 response rate (65% vs 43%, p<0.0001).[27] Recommended dose of subcutaneous secukinumab is a loading dose of 150mg every week for 5 weeks, followed by maintenance dose of 150mg-300mg every 4 weeks, or without loading dose 150mg -300mg every 4 weeks. For IV route, a loading dose of 6mg/kg is given at week 0 followed by 1.75mg/kg (not exceeding 300mg) every 4 weeks. Another IV regimen without loading dose can also be considered at 1.75mg/kg (not exceeding 300mg) every 4 weeks.

SELECTIVE T-CELL COSTIMULATION BLOCKER

Abatacept is a soluble, selective fusion protein that binds to CD80/86 receptor on antigen-presenting cells, blocking activation of T-cells. It was approved by FDA in 2017 for treatment of PsA. A randomized trial (n=170) evaluated efficacy of abatacept versus placebo in PsA patients previously treated with DMARDs. Patients were randomized to abatacept 3mg/kg, 10mg/kg, a titrating dose of abatacept, and placebo, given on day 1, 15, 29, then every 28 days. Results showed that abatacept is associated with significantly greater ACR20 response on day 169 for 10mg/kg group (48%, p=0.006 vs placebo 19%) and titrating-dose group (42%, p=0.022 vs placebo 19%). Abatacept 3mg/kg group achieved ACR20 response of 33% which is not significantly different from placebo.[41] Abatacept may be used with or without nonbiologic DMARDS. It can be administered by weekly subcutaneous injection or by monthly IV infusion. Given its low efficacy, EULAR treatment guideline (2019) suggested that abatacept should be limited to potential use after other bDMARDs have failed.[9] Dosing of IV abatacept is weight-based, ranging from 500mg (<60kg), 750mg (60-100kg) or 1g (>100kg) at week 0, 2, 4, then every 4 weeks. For subcutaneous abatacept, the recommended dose is 125mg once weekly.

THERAPEUTIC AGENTS– TARGETED SYNTHETIC DMARDS

PDE-4inhibitors

Apremilast is a phosphodiesterase-4 inhibitor. It inhibits the activity of phosphodiesterase type-4 (PDE4) which results in suppression of pro-inflammatory mediator synthesis and promotes anti-inflammatory mediators. This oral drug was FDA approved in 2014 for treatment of PsA in adults. In PALACE 3 trial (n=505), patients with active PsA and skin involvement despite a prior therapy with conventional or biologic DMARDs were randomized to apremilast (20mg BD and 30mg BD) versus placebo. A significantly higher proportion of patients in apremilast 20 mg and 30 mg groups achieved ACR20 response versus placebo (28% 20mg group, p=0.0295 vs. placebo, 41% with 30mg, p=0.0001 vs. placebo, 18% with placebo). However, there is no significant difference among groups in ACR50 and ACR70 response.[42] Under EULAR treatment recommendation (2019), apremilast may be considered in patients with mild disease and an inadequate response to at least 1 csDMARD, for whom neither a bDMARD nor a JAK inhibitor is appropriate.[9] Apremilast is generally well tolerated; common adverse events include diarrhea, nausea, vomiting, weight loss, headache and nasopharyngitis. There is an increased risk of depression. Targeted dosage of apremilast is 30mg twice daily, with a titration schedule of 5 days starting from 10mg in the morning to reduce risk of gastrointestinal symptoms.

Janus kinase inhibitor (JAK inhibitors)

JAK inhibitors are small and orally active drugs that inhibit the protein tyrosine kinases Janus kinases (JAKs) and suppress multiple cytokine and growth factor receptor signaling pathways involved in inflammatory response. Currently, two orally active JAK inhibitors tofacitinib (2017) and upadacitinib (2021) are FDA approved for treatment of PsA. Both drugs carry a FDA boxed warning of the risk of serious infections, increased rate of mortality, malignancies, cardiovascular events, and thrombosis. Healthcare professionals should assess and use with caution in patients with risk factors for above conditions.[43] Under EULAR treatment guideline (2019), JAK inhibitors may be considered in patients with peripheral arthritis and an inadequate response to at least one csDMARD and at least one bDMARD, or when a bDMARD is not appropriate.[9]

Tofacitinib selectively inhibits the Janus tyrosine kinases JAK1 and JAK3. In OPAL trial (n=422), patients with PsA ≥6 months, previous inadequate response to ≥ 1 csDMARD, and not previously treated with TNF inhibitor were randomized to receive tofacitinib, adalimumab, and placebo while receiving a stable dose of csDMARD. Tofacitinib achieved a significantly better ACR20 response than placebo at 3 months, with 50% with tofacitinib 5mg ($p<0.01$ vs placebo), 61% with tofacitinib 10mg ($p<0.001$ vs placebo), 52% with adalimumab (no p value reported), and 33% with placebo. Patients in tofacitinib groups also achieved a better result in mean reduction in HAQ-DI scores at 3 months.[44] The dosage of tofacitinib is 5mg BD for immediate release tablet and 11mg once daily for modified release tablet.

Upadacitinib is another JAK inhibitor for treatment of PsA. Efficacy of upadacitinib were assessed in SELECT-PsA 1 (n=1705) and SELECT-PsA2 (n=642) trials. In SELECT-PsA2, patients with active PsA for ≥ 6 months and inadequate response or intolerance to ≥ 1 bDMARD were randomized to upadacitinib and placebo. At 12 weeks, both upadacitinib groups (15mg and 30mg) were associated with a significantly better ACR20 response rate compared to placebo, with 56.9% for 15mg group ($p<0.001$ vs placebo 24.1%) and 63.8% with 30mg group ($p<0.001$ vs placebo 24.1%).[45] In SELECT-PsA1 (n=1,705), PsA patients with previous inadequate response to ≥ 1 nonbiologic DMARD, and not previously treated with biologic therapies or JAK inhibitors were randomized to receive upadacitinib, adalimumab and placebo. The ACR20 response rates at week 12 were better for upadacitinib 30mg (78.5%, $p<0.001$ vs placebo) and upadacitinib 15mg group (70.6% $p<0.001$ vs placebo) when compared to 36.2% with placebo group.[46] This study also showed a significantly better response rate for PASI 75 at week 16 for upadacitinib groups (62% with 30mg, 63% with 15mg, 21% with placebo, $p<0.001$ vs placebo). The recommended dosage of upadacitinib is 15mg once daily.

CONCLUSION

Psoriatic arthritis is a disease involving musculoskeletal and non-musculoskeletal manifestations associated with high disease burden and significant comorbidities. Treatment goal is to maximize health-related quality of life through control of symptoms and prevention of structural damage. Traditional treatments for PsA include csDMARD such as methotrexate, but in recent years an expanded list of drugs with a more targeted action to the underlying pathophysiology have developed. Biologic DMARDs including TNF inhibitors, IL-12/23 inhibitors, IL-23 inhibitors, IL-17 inhibitors, and targeted-synthetic DMARDs such as apremilast and JAK inhibitors prove to be efficacious in multiple trials. Treatment decisions should be tailored for individual patients and pharmacists play a critical role in appropriate patient education and medication adherence.

Author's background

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Questions for Pharmacy Central Continuing Education Committee Program

(Please be informed that this article and answer sheet will be available on PCCC website concurrently. Members may go to PCCC website (www.pccchk.com) to fill in their answers there.)

2 CE Units

Overview of the Drug Therapy of Psoriatic Arthritis

1. ***Which of the following is FALSE regarding psoriatic arthritis?***
   a. Psoriatic arthritis involves both musculoskeletal and non-musculoskeletal manifestations
   b. The prevalence of psoriatic arthritis in patients with psoriasis is around 90%
   c. Pathophysiology of psoriatic arthritis is thought to involve genetic, immunologic and environmental factors.
   d. All of the above

2. ***Which of the following cytokine(s) is/are the therapeutic target for treatment of psoriatic arthritis***?
   a. Interleukin-12
   b. Interleukin-23
   c. Tumor necrosis factor
   d. All of the above

3. ***Which of the following is NOT a common clinical manifestation of psoriatic arthritis?***
   a. Dactylitis
   b. Nail changes
   c. Enthesitis
   d. Watery diarrhea

4. ***Which of the following is TRUE regarding the treatment approach of psoriatic arthritis?***
   a. NSAID may be used alone as initial treatment in patient with active polyarticular disease
   b. Consider conventional DMARD when there is inadequate response to NSAID with or without local glucocorticoid after 3 months
   c. In patient with inadequate response to conventional DMARD, consider initiate another conventional DMARD and observe for 3 months
   d. In patient with inadequate response to conventional DMARD, a biologic DMARD should be considered

5. ***Which of the following is NOT a common adverse reaction of TNF inhibitors?***
   a. Injection site reactions
   b. Renal toxicity
   c. Hepatotoxicity
   d. Increased risk of infection

6. ***Which of the following is TRUE regarding abatacept***
   a. It is available as subcutaneous injection and intravenous infusion
   b. It is not recommended to be used with conventional DMARD
   c. It is recommended as a first line agent after inadequate response to conventional DMARD
   d. Because of its high efficacy, abatacept should be considered for severe disease with inadequate response to other bDMARDs

7. ***Which of the following is NOT a FDA boxed warning for JAK inhibitor Tofacitinib?***
   a. Increased risk of cardiovascular events
   b. Increased risk of serious infections
   c. Increased risk of severe liver injury
   d. Increased risk of malignancies

8. ***What is the mechanism of action of Ustekinumab?***
   a. It is a chimeric monoclonal antibody that inhibits IL-12 and IL-23 cytokines
   b. It is a humanized monoclonal antibody that inhibits IL-12 and IL-23
   c. It inhibits janus kinase and suppresses multiple cytokine and growth factor receptor signaling pathways
   d. It is a humanized monoclonal antibody that inhibits IL-12 and IL-17

9. ***Which of the following is the recommended dosing for ustekinumab in a patient with body weight of 60kg?***
   a. 45mg subcutaneously at week 0, 2, 4, followed by 45mg subcutaneously every 8 weeks
   b. 45mg subcutaneously at week 0, 4, followed by 45 mg subcutaneously every 12 weeks
   c. 90mg intravenously at week 0, 4, followed by 45mg subcutaneously every 12 weeks
   d. 90mg subcutaneously at week 0, 4, followed by 90mg subcutaneously every 12 weeks

10. ***Which of the following is FLASE regarding apremilast?***
    a. Apremilast is a phosphodiesterase-4 inhibitor
    b. A 5-day dose titration schedule is required on initiation of apremilast to reduce risk of gastrointestinal side effects
    c. Patients on apremilast should be monitored for increased risk of depression
    d. Apremilast should be considered as the drug of choice when patient has inadequate response to csDMARD

Answers will be released in the next issue of HKPJ.

Primary Care Pharmacy – A Review of Current Situation and Future in Hong Kong

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ABSTRACT

Hong Kong's public healthcare system has been under intense pressure due to the aging populations and increasing chronic diseases prevalence. To tackle the challenge, the Primary Healthcare Blueprint was released by Hong Kong Special Administrative Region (HKSAR) Government which aims to develop a community-based primary healthcare system and promote primary preventive services. As part of the Government's efforts to enhance the role of community pharmacists in primary healthcare system, Hong Kong pharmacists should broaden their scope of practice by utilizing their medication expertise to improve patient health outcomes, optimizing healthcare utilization, and fostering the collaboration within multi-disciplinary team. The Blueprint offered unique opportunities for community pharmacies to transform and expand their service scope, as long as the challenges and barriers are being addressed.

Keywords: *Primary care, pharmacists, community pharmacy, collaboration, blueprint, transform*

INTRODUCTION

Overloaded public healthcare system is no secret to people in Hong Kong.[1] The annual attendance of Hospital Authority (HA) Specialist Outpatient Clinic (SOPC) has reached over 8 million visits in 2022 to 2023.[2] The number of Hong Kong populations with known chronic health conditions was 2.16 million in 2020 to 2021, which was 30.6% of total Hong Kong populations.[3] It was projected to reach 3 million by 2039.[4] More alarmingly, a significant number of patients with chronic disease, estimated as much as twice the number of diagnosed cases, remain undiagnosed and untreated.[5] With 75% of those over 65 suffering from chronic illness[3] and the elderly population expected to reach 2.52 million by 2039,[6] this trend will significantly increase healthcare demand and strain the system further.

Over the years, alleviation of the ever-increasing burden on the public healthcare system, in terms of high service utilisation and financial cost, has been one of the key focuses of Hong Kong Special Administrative Region (HKSAR) Government healthcare policies.[1] The Primary Healthcare Blueprint was subsequently released in late 2022, aiming to transform Hong Kong healthcare system by shifting the focus from previous treatment-oriented secondary and tertiary healthcare to prevention-oriented primary healthcare.[7] Primary care is the key process in health system that address the comprehensive health needs of a person at community level, integrating care, disease prevention, promotion and education.[8] It is regarded as the most inclusive, equitable and cost-effective way to achieve universal health coverage.[9] In recent years, there has been a growing demand for community pharmacy to be integrated within the primary healthcare system. The trend was further accelerated during COVID-19 pandemic.[10] This article reviews the current landscape of primary care pharmacy in Hong Kong and explores the potential opportunities and challenges in the future.

PRIMARY CARE PHARMACY – REVIEW OF CURRENT SITUATION

Conventionally, the majority of primary care pharmacy in Hong Kong is limited to privately-owned community pharmacies, including both chain stores and independent for-profit pharmacies, serving the general populations. Despite studies in UK and US found that community pharmacists are the first contact point when people faced

non-emergency medical issue due to lower cost to manage symptoms and less waiting time,[11] local study found that medical doctors and Chinese medicine practitioners are the two most preferred healthcare professionals for seeking advice when people suffered from minor illness.[12, 13] The reasons behind the discrepancy could be complex and multiple. In Hong Kong, medical doctors have both prescribing and dispensing rights. Patients with private medical insurance may preferentially visit private medical doctors for consultations with medications supplied at point of care. Medications self-purchased by patients at community pharmacies are often not covered by medical insurance unless they were prescribed by the medical doctors. This dynamic may contribute to the preference for seeking medical care from doctors. On the other hand, Hong Kong public healthcare services especially the Accident and Emergency (A&E) Department are well known of their relatively low fees charged to local residents and convenient access.[14, 15] It serves as a safety net for the low income and underprivileged group despite study found that the service was commonly misused by the general public including those not in lower socio-economic class.[14] Data from HA reported that over 60% of A&E visits were Triage 4 and Triage 5 cases, i.e. semi-urgent and non-urgent attendances. The number of cases were significantly higher than that in the UK, where only 33% of their A&E visit are reported non-emergency cases.[15] Many of these A&E cases can be managed in the primary care settings.[14] One last arguable issue was the medical certificate that is required for employees taking paid sick leave under the Hong Kong Employment Ordinance.[16] Despite the fact that this may not be strictly enforced for short sick leave lasts for 1 or 2 days, its implementation often hinges on internal policies of individual companies.[12] While only medical doctors, Chinese medicine practitioners and dentists are authorised to issue medical certificates in Hong Kong,[16] this may arguably skew local working populations to visit medical doctors for minor ailments. While the abovementioned health services predominantly favour medical practitioners, the role of community pharmacists was often under-utilised in Hong Kong. Consequently, this left many community pharmacies inevitably shift focus to sell general merchandise and home toiletries in order to ensure sustainability of their business.

Not until recent years, various primary care pharmacies operated by Non-Governmental Organisations (NGO) were established in Hong Kong. These non-profit primary care pharmacies, supported by various fundings, offer HA Self-Financed Items (SFI) prescription medicines at relatively affordable price. As a result, many patients visit these NGO pharmacies to seek pharmacist advice and services. Some of these pharmacies provided additional pharmacist-led health services including but not limited to medication management, minor ailment management, travel medicine pack, nursing home and various outreach services. With fundings from charities and sponsoring bodies, these NGO pharmacies play a significant role in primary care settings by providing community health services and affordable drugs for the population.

The establishment of District Health Centres (DHC) since 2019 marked another step forward by the HKSAR Government in developing primary healthcare. The model represented a horizontal integration of district-based primary healthcare with strategic purchasing and medical-social service collaboration, combined with vertical integration with secondary and tertiary care services through protocol-driven care pathway.[7] This service model serves as a bridge between public healthcare system and community-based healthcare services to improve patient care across different settings. Community pharmacists actively engage in this multi-disciplinary setting providing various health education and services in the DHC.[7] With progressively more DHC operators establishing primary care pharmacies and strengthen the local primary healthcare infrastructure, an expanding breadth and depth of collaboration between DHC and primary care pharmacies can be anticipated in delivering person-centered care.

OPPORTUNITIES FOR FUTURE DEVELOPMENT OF PRIMARY CARE PHARMACY IN HONG KONG

Over the past decade, there was a global growing trend to integrate services provided by pharmacists into primary care team, including Australia, Canada, the United Kingdom and the United States.[17] Collaborations among healthcare professionals including pharmacists can improve communication and coordination. They are optimally placed to identify and address drug related problems, and can improve the availability and efficiency of healthcare.[18, 19] Overseas model where pharmacists are integral member of the multi-disciplinary primary care teams has demonstrated extended roles in many direct patient care activities, including but not limited to medication management,[18, 20] vaccination,[21] disease screening,[22, 23] and pharmacist prescribing.[24] Primary healthcare blueprint by HKSAR Government clearly indicated the uniqueness of pharmacy services in primary care. This would facilitate primary care pharmacy to introduce more services-based models, which are driven by professional services collaborating with other healthcare providers across in different sectors. This section will discuss some of the service models from overseas and explore the potential applicability in Hong Kong setting.

Introduction of new specialised services in primary care pharmacies

a) Minor Ailment Service

The usage of pharmacist service related to minor ailment is under-utilised in Hong Kong. Pharmacists can assess symptoms and consider any long-term conditions, and the medicines that patients are taking, before providing a recommendation for minor ailments. A recent introduction of minor ailment service by a local chain pharmacies in Hong Kong, in partnership with corporate business, is an innovative solution.[25] Pharmacists will conduct a differential diagnosis and issue a pharmacist note to patient for submission to their companies as a proof of absence from work. A similar practice is under trial in Australia that the patients are exempted from work with pharmacist consultation for minor illnesses. This has proven to reduce the waiting time for employees at doctor's clinics, reduce the claim and cost charged to insurance companies and eventually save on premiums during renewal.[26]

A study In UK demonstrated that up to 40% of general practice (GP) visits were for minor illnesses which could likely be managed outside of the clinical setting.[27] During COVID-19, integration of primary care pharmacy into National Health Service (NHS) UK was strengthened by delivering more clinical services and made primary care pharmacy as the first port of call for minor illness. NHS can refer patients to the pharmacies for advice and treatment. Over 2 million referrals have been made through this route and offload the workload of UK healthcare system during the pandemic.[28] In Jan 2024, NHS introduced "Pharmacy First Service" where primary care pharmacies can supply over-the-counter (OTC) and prescription medicines to patients without the need to visit medical doctors, for seven common conditions including sinusitis and sore throat.[28] This is an NHS-funded service which offers patients options to visit their community pharmacies for the self-treatable conditions who might have otherwise attended their A&E and doctors for treatment. The scheme has proven to be a cost-effective way to manage patients presenting to GPs with minor ailments.[29] A similar service model could be learned and piloted in Hong Kong to ease the workload and long waiting time of public health services at General Outpatient Clinic and A&E. Community pharmacists can potentially play a more significant role in delivering minor ailment service, act as a health coach dedicated to improving the health and wellness of general public.

b) Vaccination

According to Guideline of Vaccination Subsidy Scheme by HKSAR Centre of Health Protection, vaccination administration is a medical procedure and it is the prime responsibility of the medical doctor in-charge of the vaccination arrangement in consideration of safety and liability.[30] The vaccination should be administered by qualified healthcare professionals or trained personnel with at least one doctor, a registered nurse or an enrolled nurse to supervise on-site.[30] While the University of Hong Kong offers immunisation training to pharmacists, collaboration with doctors and nurses will be required if pharmacists are to provide vaccination services in Hong Kong. This should not limit the potential role of pharmacists as immunisers since research has found that vaccination service conducted in primary care pharmacies boosted immunisation rate, increased access to vaccines and offered convenience for patients.[31] Influenza, pneumococcal, herpes zoster, human papillomavirus and COVID-19 vaccines are some of the common vaccines administered by pharmacist immunisers in primary care pharmacies.[32] However, the types of vaccines and age groups that pharmacist can administer vary by country and are influenced by local guidelines and regulations.[33] The future development of a primary care health hub with multi-disciplinary healthcare professionals providing one-stop service should be further explored.

c) Health Screening

Health screening is a prevention strategy that seeks to identify chronic diseases and limit the associated disability by early detection and treatment.[34] It was shown to improve patients' quality of life by preventing the onset and reducing complications of the chronic diseases.[35] Various disease screening models and point-of-care tests are available in primary care pharmacies such as cancer screening, asthma, chronic obstructive pulmonary disease, osteoporosis, depression, hypertension, hypercholesterolaemia, and diabetes.[22, 23, 36-38] High-risk individuals will be referred to the family doctors for further assessment and treatment follow-up. Research indicates that the key advantage of screening services through primary care pharmacies are the convenience of access, both in terms of location and opening hours, and cost-effectiveness.[38, 39] Primary care pharmacies, often the first point of contact for patients, provide an optimal setting for community pharmacists to screen, educate and support patients in disease prevention and self-management with the assistance of diagnostic medical devices and test kits. Pharmacists are in a unique position to provide screening services to improve patient health outcomes.[40]

d) Medication Management Services

Medication management services (MMS), defined as "spectrum of patient-centered, pharmacist-provided, collaborative services that focus on medication appropriateness, effectiveness, safety, and adherence with the goal of improving health outcomes", has been conducted worldwide.[41, 42] Some are subsidised or contracted by the government such as the UK and Australia.[43, 44] In the UK, two of the examples of MMSs are Medicines Use Reviews (MURs) and the New Medicine Service (NMS) performed by community pharmacist. They were first introduced in 2005 on a basis of contracted services, requiring community pharmacists who chose to deliver them to receive training and to meet specified service requirements.[45] These services are free to patients. Remuneration for contracted pharmacies from the NHS is £28 per MUR, up to a maximum of 400 per year, and up to £28 per NMS depending on numbers completed. The MURs aim to improve patients' understanding of their medicines and adherence, particularly among those with chronic conditions, highlight problematic side effects and propose management where appropriate, as well as reduce medicines wastage.[45] The NMS targets people with long-term conditions and newly prescribed medication to improve their medicines adherence, and there is also an explicit aim for the NMS to support patients in making decisions about their treatment and self-management. A systemic review demonstrated that MMS improved patients' clinical status by effectively reducing the rate of re-admission, A&E visit, adverse drug events and drug-related problems.[46] A cost-analysis study showed that MMS is a cost-effective measure to improve the quality of life of the population with chronic disease, compared to usual care.[47]

e) Pharmacist Prescriber in Disease Management Services

The concept of pharmacist prescribing was pioneered in the US in the 1990s.[48] In general, pharmacist prescribers are legally authorised to prescribe, supply and administer medicines, despite their actual role and prescribing rights vary in different countries.[48, 49] Additional training is required and pharmacists have to enrol into a specific register with regulatory authorities of their countries before practice. In most states of the US, pharmacist prescribers work collaboratively with medical doctors under collaborative practice agreement (CPA). The pharmacist prescriber assumes responsibility for specific patient care functions that are otherwise beyond their typical scope of practice, but are aligned with their education and training. This included the initiation and modification of drug therapy, undertaking a physical examination, and ordering laboratory tests. The extent of services authorised under the CPA depends on individual state regulations and the terms of specific agreement between the pharmacist and medical doctors.[50, 51] In UK, pharmacist independent prescribers (PIP) can autonomously prescribe a wide range of medicines for conditions within their scope of practice and clinical competence.[52] These services include providing medicines for minor short-term illness, chronic conditions involving dosage adjustments of medicines, referral to other healthcare professionals, follow-up care and deprescribing.[52, 53] While in most territories of Canada, pharmacists have limited powers but can provide emergency prescribing and extend prescription services.[54]

A systemic review of sixty-five studies from the UK (n = 34), Australia (n = 13), Canada (n = 6) and the USA (n = 5) found that mostly positive experiences and views towards pharmacist prescribing were reported by patients and healthcare professionals including doctors and pharmacists.[55] The major benefits reported were ease of patient access to healthcare services, improved patient outcomes, better use of pharmacists' skills and knowledge, improved pharmacist job satisfaction, and reduced physician workload. The reported challenges were largely associated with accountability for prescribing, limited pharmacist diagnosis skills, lack of access to patient clinical records, and issues concerning organisational and financial support.[55]

Some of these models discussed were similar to our disease management service provided by public hospitals under HA in Hong Kong. One example was the pharmacist-led warfarin clinic, where clinical pharmacists can renew or adjust warfarin dose or make referral to specialists when needed according to mutually agreed protocol.[56] Other pharmacy service models in Hong Kong primary care settings, on the other hand, are yet to be developed. Given the HKSAR Government initiative in enhancing the role of community pharmacies in primary healthcare, primary-based pharmacist-led disease management service models should be explored with the aim to improve patient access to healthcare services, improved patient outcomes, and to ease the workload of public healthcare system.

Public Private Partnership

In order to shift patients from the overstretched public healthcare system to primary healthcare, collaboration between public and private sectors should be adopted. During COVID-19 pandemic, patients with chronic diseases have restricted access to HA SOPC due to rescheduling of appointments or patients' fear of

returning to hospitals. Some patients could not access to refill their chronic medications. In view of the gap, a Hong Kong local pharmacy chain has launched a hospital medication collection service since April 2020.[57] The service offered options to patients to collect their long-term HA medications at the community pharmacies without the need to return to hospital during the pandemic. Community pharmacists provided counselling to these patients during medication collection. Future services including having HA drug refill dispensed in primary care pharmacies should be explored.[7] Patients with chronic disease who are in stable conditions would be ideal candidates to access such service as an alternative to frequent visits to SOPC and HA pharmacies.[58]

Health Education & Promotion of Self-Care

Self-care is defined as "the ability of individuals, families and communities to promote health, prevent disease, maintain health, and cope with illness and disability with or without the support of a healthcare provider (doctor)".[59] It shows empowerment of patients to manage their health and well-being actively.[59] As populations grow and health needs diversify, the need for access to medical care and the reliance on self-care will continue to grow.

Health services in workplace settings are also another way to promote health education and self-care of chronic diseases. A study included 573 diabetic employees from 10 geographic locations receiving consultations from pharmacists to achieve their clinical and self-care goals.[60] On average, pharmacists received an estimated $391 USD per patient in total with an average of 6 visits per participant. Patients showed significant improvement in clinical parameters including haemoglobin A1c (HbA1c), low-density lipoprotein cholesterol (LDL-C), blood pressure and body mass index (BMI). The total cost-savings during the first year of program implementation were estimated at $339,875 USD for patients and $278,512 USD for employers. This service may also encourage patients to receive influenza vaccinations, eye examinations and foot examinations. Another program also enrolled employees for regularly follow-ups with community-based pharmacists on diabetes or hypertension coaching program respectively.[61] Blood pressure and LDL-C values improved significantly from baseline for both groups, and within the diabetes cohort, mean HbA1c levels improved significantly. The above showed that pharmacists have demonstrated value for improving patient outcomes, providing cost-savings, and ultimately benefiting individual wellness through a preventive health approach.

In Hong Kong, self-care is not adequately emphasised. Patients tend to seek medical advice from doctors for minor ailments, or seek medical information from non-credible source.[12] Low health literacy is a common issue and it is a barrier to self-care, particularly in those with lower socioeconomic status, limited education and older adults.[62] Public may not be aware of the role of community pharmacists, who can provide "over the counter" medicines and advice that can help alleviate symptoms.[27] Pharmacists can build up a "shame-free" environment in which individuals can ask questions as well as receive non-judgmental answers and encouragement to improve their well-being regardless of their level of health literacy. Consultation rooms in the primary care pharmacies can also provide a more suitable and private environment for patients to express their questions and concerns. Future collaboration between DHCs and primary care pharmacies in Hong Kong for management of minor ailments, two-way patient referral mechanism, drug refills with counselling services and case management on chronic disease can be further explored to empower patient on self-care and improve the health literacy.[7]

CHALLENGES, SUSTAINABILITY AND WISHLIST

Despite the well-recognised accessibility of primary care pharmacies to patients, several issues and barriers would need to be addressed to ensure sustainability of pharmacist-led health services. These include health record sharing, regulatory barriers, continuous professional development and remuneration of services.

Enhancement of electronic Health Record Sharing System

Developed by HKSAR Government, the electronic Health Record Sharing System (eHRSS) is a centralised digital health record platform for patients and multidisciplinary healthcare professionals. The system enables two-way sharing of patients' health record among healthcare professionals practicing in public and private sectors.[63] Upon consent by patients, community pharmacists can access patients' health record in eHRSS, conduct pharmaceutical services and provide various preventive health services. However, community pharmacists are not considered as network service provider and no clinical documentation can be input into eHRSS under current system, which acts a barrier to clinical information sharing and collaboration with other healthcare professionals. Current system only reflects prescribing and dispensing histories without actual medication usage. This undermines continuity of care and patient safety. System enhancements would be required if primary care pharmacies are to be better integrated into primary healthcare systems and play a bigger role in delivering various health services. This would facilitate the dialogue and collaboration between pharmacists and other healthcare professionals.

Regulatory Barriers

Current regulations in Hong Kong restrain pharmacists from extending their practice scope. Some of the service models discussed in this article required amendments to regulations. One example is the pharmacist prescriber service, which may include prescription modification and optimisation, from dose adjustments to substitution of therapy according to the protocol, will require regulatory amendment.[50] Same as if the community pharmacists are to provide emergency supply of existing prescription drugs to patients for continuity of care, in reference to the service model of Canada and UK.[28, 54] Health screening is another example as routine service provision by other healthcare professionals will be required unless a regulatory framework is established for pharmacists to conduct point-of-care blood testing. Government and policymakers should address the regulatory barriers when introducing new pharmacy services, despite this not hindering the potential role of community pharmacists in primary care settings.

Continuing Professional Development for Pharmacist

Continuing Professional Development (CPD) is an ongoing, self-directed, structured, outcomes-focused learning cycle that focuses on maintaining and improving performance of professional practice.[64] It does not replace traditional Continuous Education (CE), but rather enhances CE in a broader approach which ensures pharmacist competence and performance.[65] In Hong Kong, no CE nor CPD are required for pharmacists to renew annual practising license. However, as the healthcare environment changed rapidly with technology advancements, the role of pharmacist has been undergoing transformation worldwide.[66] CPD has become crucial for pharmacists, not to just keep up the latest development and innovation in the field, but also to develop new skills and gain a broader understanding of all aspects of pharmaceutical care. Since the HKSAR Government aims to enhance the role of community pharmacists in delivery of primary healthcare services,[7] CPD for pharmacists is suggested and should be made mandatory in the long run. This is vital to ensure pharmacists are adequately trained and equipped to deliver high-quality care and service to patients.

Remuneration and Reimbursement of Pharmacy Services

Preventive health and MMS led by pharmacists have been demonstrated to improve patient health outcomes, reduce healthcare costs and justify the need for a proper reimbursement model to remunerate pharmacists for their professional services.[67-70] Various remuneration models are available in other countries where governments pay and reimburse community-based pharmacist-led clinical services.[69, 71] In Hong Kong, however, such reimbursement models are yet to be developed and do not incentivize pharmacists to devote their time and effort to provide preventive health services. A higher opportunity cost is needed for pharmacy services in comparison to dispensing prescriptions and selling OTC medicines and supplements. Reimbursement from the government is especially important for pharmacist-led health services to make the services sustainable, as these services are often not covered by medical insurance.[72] Refit of pharmacy premises with private consultation room installed are also required before service launch. This will help ensure that pharmacists secure the resources required to provide high-quality care to patients, including access to the latest medications, space, equipment, and technology.[73] Proposed reimbursement models by the individual patient, type of visit (initial versus follow up), service provided, or time spent with the patient are suggested and should be further explored.[74]

CONCLUSION

Transformation of Hong Kong healthcare system is underway. Collaboration is vital to success. Pharmacists can play a greater role in the new primary care system, by providing various specialized health services to keep our local citizens healthy, and leveraging pharmacists as health coaches. Different funded pharmacist-led service models shall be explored for future development of primary care pharmacy. Pharmacists engaged in primary care setting shall embrace the opportunities, prepare and build themselves as a trusted health and wellness partner of the public.

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The Activities of the Society of Hospital Pharmacists

Educational Webinars

The Society of Hospital Pharmacists of Hong Kong (SHPHK) has organized two educational webinars recently on topics related to pharmacy practice and patient care.

The first lecture, titled "Application of ChatGPT in drug information," was held on 5th February, 2024 and was jointly organized by the HKU Department of Pharmacology & Pharmacy and the SHPHK. Dr. Sara Grossman, Associate Professor of Pharmacy Practice at Long Island University's College of Pharmacy, was the distinguished speaker for this session. Dr. Grossman shared practical skills and limitations when utilizing ChatGPT as a drug information searching tool.

The second lecture, titled "Pharmacy Strategies in Empowering Patients in the smoking cessation journey," took place on 8th January, 2024. We invited two speakers for this lecture: Mr. Cheng Wai Chung, a community pharmacist, and Mr. Louis Chow, a hospital pharmacist. Their combined expertise and practical experience in patient care and smoking cessation strategies provided a comprehensive overview of how pharmacists can play a pivotal role in empowering individuals to overcome tobacco addiction. They also introduced the future development of pharmacist smoking cessation service.

If you missed any of the above webinars and you are a member of SHPHK, you can always visit SHPHK homepage and sign in to view all the past webinar recordings (shphk.org.hk > resources > learning activities)

Press Conference

On 10th March 2024, a press conference was held, co-organized by the SHPHK, Hong Kong Skin Health

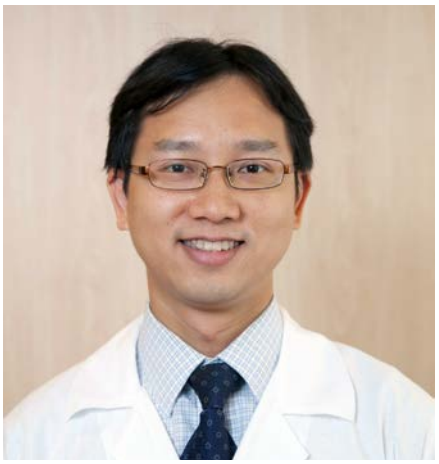
Foundation, and The Hong Kong Society for Infectious Diseases. Mr. So Yiu Wah, Vice President of SHPHK, along with Dr. Lin Wai Chi and Dr. Chan Hau Ngai, emphasized the importance of preventive measures and timely administration of the herpes zoster vaccine, particularly for those at higher risk. This collaborative effort aimed to raise awareness and empower the public to protect their health.

Change of President

Mr. William Chui has been a general committee member of the SHPHK since 2009 and has held the position of President since 2013. On April 1, 2024, Mr. Chui will step down from his presidency, ending his 15 years of service at the SHPHK.

We would like to express our deep gratitude to Mr. William Chui for his tireless service to the SHPHK over the past 15 years.

Stepping into the role of President will be Mr. So Yiu Wah, the current Vice President of SHPHK. Mr. So previously served as a general committee member of SHPHK since 2004 and held the position of President from 2008 to 2012. After a brief hiatus, Mr. So rejoined the SHPHK general committee in 2023, assuming the role of Vice President.



We welcome Mr. So Yiu Wah as the incoming President of the SHPHK, and look forward to a bright future under Mr. So's leadership and the continued growth and success of our Society.

The transition in leadership marks an important milestone for SHPHK. Mr. Chui's dedication and contributions during his tenure as President have greatly impacted the organization and the pharmacy profession in Hong Kong. Now, Mr. So will take the helm, leveraging his commitment to further advance the goals and initiatives of SHPHK.

The SHPHK looks forward to the new chapter under Mr. So's leadership, building upon the foundation laid by Mr. Chui and continuing to serve as a leading voice for hospital pharmacists in Hong Kong.

You are most welcome to follow the Society's Facebook page (@SHPHK) and Instagram (@SHPHK1987) to know more about the Society's development and activities. You may also visit the Drug Education Resources Centre (DERC) Website: www.derc.org.hk to keep abreast of the latest news and development of pharmaceutical services in Hong Kong. Join us now as new member or renew your membership at the Society's website: www.shphk.org.hk.

NEW PRODUCTS

Edited by Lucilla Leung

Enhertu powder for concentrate for solution for infusion (Daiichi Sankyo and AstraZeneca)

Active Ingredients

Trastuzumab deruxtecan

Indication

Breast cancer:
HER2-low breast cancer Enhertu as monotherapy is indicated for the treatment of adult patients with unresectable or metastatic HER2-low breast cancer who have received prior chemotherapy in the metastatic setting or developed disease recurrence during or within 6 months of completing adjuvant chemotherapy.

Gastric cancer:
Enhertu as monotherapy is indicated for the treatment of adult patients with advanced HER2-positive gastric or gastroesophageal junction (GEJ) adenocarcinoma who have received a prior trastuzumab-based regimen.

Dosage and Administration

Breast cancer:
HER2-low breast cancer Patients treated with trastuzumab deruxtecan should have documented HER2-low tumour status, defined as a score of IHC 1+ or IHC 2+/ISH-, as assessed by a CE-marked IVD medical device. If a CE-marked IVD is not available, the HER2 status should be assessed by an alternate validated test

The recommended dose of Enhertu is 5.4 mg/kg given as an intravenous infusion once every 3 weeks (21- day cycle) until disease progression or unacceptable toxicity.

Gastric cancer:
Patients treated with trastuzumab deruxtecan for gastric or gastroesophageal junction cancer should have documented HER2-positive tumour status, defined as a score of 3 + by immunohistochemistry (IHC) or a ratio of ≥ 2 by in situ hybridization (ISH) or by fluorescence in situ hybridization (FISH), assessed by a CE-marked in vitro diagnostic (IVD) medical device. If a CE-marked IVD is not available, the HER2 status should be assessed by an alternate validated test.

The recommended dose of Enhertu is 6.4 mg/kg given as an intravenous infusion once every 3 weeks (21-day cycle) until disease progression or unacceptable toxicity.

The initial dose should be administered as a 90-minute intravenous infusion. If the prior infusion was well tolerated, subsequent doses of Enhertu may be administered as 30-minute infusions. The infusion rate of Enhertu should be slowed or interrupted if the patient develops infusion-related symptoms (see section 4.8). Enhertu should be permanently discontinued in case of severe infusion reactions.

Adverse Reactions

Enhertu 5.4mg/kg

The most common adverse reactions were: nausea (76.8%), fatigue (56.1%), vomiting (44.6%), alopecia (39.1%), anaemia (35.1%), neutropenia (34.4%), constipation (34.3%), decreased appetite (33.1%), diarrhoea (29.3%), transaminases increased (27.6%), musculoskeletal pain (26.5%), leukopenia (24.3%), and thrombocytopenia (24.2%).

Enhertu 6.4mg/kgThe most common adverse reactions were nausea (71.1%), fatigue (58.8%), decreased appetite (53.8%), anaemia (43.5%), neutropenia (42.2%), vomiting (39.1%), diarrhoea (35.5%), alopecia (35.5%), constipation (31.8%), thrombocytopenia (30.5%), leukopenia (28.3%) and transaminases increased (23.7%).

Forensic classification

P1S1S3

Padcev (Astellas)

Active Ingredients

Enfortumab vedotin

Indication

Monotherapy for locally advanced or metastatic urothelial cancer in adults who have previously received a platinum-containing chemotherapy & a programmed death receptor-1 or programmed death-ligand 1 inhibitor.

Dosage and Administration

IV 1.25 mg/kg (up to max 125 mg for patients ≥100 kg) infused over 30 min on days 1, 8, & 15 of a 28-day cycle until disease progression or unacceptable toxicity.

Contraindications

Hypersensitivity to the active ingredients and the excipients.

Adverse Reactions

Anaemia; hyperglycaemia, decreased appetite; peripheral sensory neuropathy, dysgeusia; dry eye; diarrhoea, vomiting, nausea; alopecia, pruritus, rash, rash maculo-papular, dry skin; fatigue; increased ALT &/or AST, decreased wt. Peripheral neuropathy, peripheral motor neuropathy, peripheral sensorimotor neuropathy, paraesthesia, hypoaesthesia, gait disturbance, muscular weakness; pneumonitis; drug eruption, skin exfoliation, conjunctivitis, dermatitis bullous, blister, stomatitis, palmar-plantar erythrodysesthesia syndrome, eczema, erythema, rash erythematous, rash macular, rash papular, rash pruritic, rash vesicular; infusion site extravasation.

Drug Interactions

Closely monitor for signs of toxicities when receiving concomitant strong CYP3A4 inhibitors (eg, boceprevir, clarithromycin, cobicistat, indinavir, itraconazole, nefazodone, nelfinavir, posaconazole, ritonavir, saquinavir, telaprevir, telithromycin, voriconazole). Increased unconjugated microtubule-disrupting agent monomethyl auristatin E (MMAE) Cmax & AUC exposure w/ ketoconazole (combined P-gp & strong CYP3A inhibitor). Decreased exposure of unconjugated MMAE w/ strong CYP3A4 inducers (eg, rifampicin, carbamazepine, phenobarb, phenytoin, St. John's wort).

Forensic classification

P1S1S3

Hong Kong Pharmaceutical Journal: For Detailed Instructions for Authors

INTRODUCTION

Hong Kong Pharmaceutical Journal (HKPJ) is the official publication of the Pharmaceutical Society of Hong Kong, the Practising Pharmacists Association of Hong Kong and the Society of Hospital Pharmacists of Hong Kong. It is a journal of the pharmacists, for the pharmacists and by the pharmacists. The Journal is currently divided into several sections: Editorial Comment; News & Short Communications; Pharmacy Practice; Pimary Care, Over-the-Counter & Health; Drugs & Therapeutics; Herbal Medicines & Nutraceuticals; Pharmaceutical Technology and New Products. It publishes review articles or original papers relevant to these different fields of pharmacy. In addition to the regular three issues of the Journal per year, there are issues dedicated solely to reports on special function of the society. The Aims and Scope of the Journal are published on the inside back cover of the first issue of each year.

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