HONG KONG PHARMACEUTICAL JOURNAL

VOL 30 NO 3 Sep - Dec 2023 ISSN 1727-2874

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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VOL 30 NO 3 Sep - Dec 2023 ISSN 1727-2874

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For all enquiries regarding advertisement, please contact:
Mr. Kemo Lam (Tel. 5445 0807) or Ms. Kate Chau (Tel: 2376 3090)
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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:

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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.

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A new milestone of Hong Kong Pharmaceutical Journal

We are thrilled to announce a significant milestone in the evolution of *Hong Kong Pharmaceutical Journal*. In February, we will embark on an exciting journey as we introduce the soft launch of our online website, marking a new chapter in our commitment to providing accessible scholarly content. With the rapid advancements in technology and the changing landscape of publishing, we recognize the need to adapt and embrace the opportunities presented to us. As we strive to cater to the diverse needs of our audience, we have made the decision to transition from a traditional hard copy format to an online platform. Starting from next issue (Volume 31, Number 1), *Hong Kong Pharmaceutical Journal* will be available online only.

In this issue on page 68, "Conversations with pharmacy leaders in Hong Kong – skills for success: lateral thinking, confidence & the three Rs" written by Chan Stephanie Nok-Yan et al., Prof. Ian Wong shares with us his thoughts and experiences to his success as a pharmacist, educator and researcher. Having had the opportunity to work alongside Prof. Wong for more than a decade, I have been fortunate enough to observe the embodiment of his "Three Rs" - Respect, Resilience, and Resoluteness - in his work. He is not only my superior, but also a sagacious mentor, an inspiration and a trusted confidant.

In the article authored by Tang Ho Yeung et al., titled "Safety and efficacy of high-potency statin in Chinese patients with established cardiovascular disease," featured on page 70, it was reported that high-intensity statins demonstrated a greater reduction in low-density lipoprotein cholesterol (LDL-C) levels in patients with acute coronary syndrome. However, these statins were associated with a higher incidence of adverse effects compared to lower-intensity statins. Interestingly, the study found that neither statin intensity nor LDL-C goal attainment had significant effects on the occurrence or time-to-event of efficacy outcomes.

As we venture into this fresh chapter, we wish to extend our heartfelt appreciation to our readership for their unwavering support over the years. Your continued support is truly invaluable as we embark on this exhilarating digital journey. We firmly believe that transitioning to our online platform will not only enrich your experience but also present new avenues for growth. Furthermore, I would like to seize this opportunity to express my deep gratitude to the dedicated members of our Editorial Committee. Their tireless commitment and diligence have been instrumental in curating each issue. Additionally, I extend my sincere thanks to all the authors who have wholeheartedly supported the Journal. Your contributions have been greatly appreciated.

As always, you may provide suggestions and give feedbacks on any aspect of the Journal by contacting me or other members of the Editorial Committee. We would very much like to hear your thoughts on any part of the Journal and how we can further develop the Journal. But most importantly, how we can make it more appealing to you, our valued readers.

May PS Lam
Editor-in-Chief
29 January 2024

Prepared by Branson Fok & Candice Leung

Subcutaneous Semaglutide Reduces Heart Failure-related Symptoms in Obese Patients Having Heart Failure with Preserved Ejection Fraction

Date: September 21, 2023

Heart failure with preserved ejection fraction (HFpEF) is clinically defined as heart failure with a left ventricular ejection fraction larger than 50%. There are currently no standardized treatment regimens for obese patients with HFpEF. Semaglutide, a glucagon-like peptide-1 (GLP-1) receptor agonist, is indicated as an adjunct for chronic weight management. Evidence showing favourable effects in cardiometabolic risk factors using subcutaneous semaglutide was also documented, which underlies its potential benefits on cardiovascular health.

The randomized, double-blind, placebo-controlled STEP-HfpEF trial recruited 529 HfpEF patients with a body-mass index (BMI) larger or equal to 30 across 13 countries. Participants were randomly assigned in a 1:1 ratio to receive either once-weekly subcutaneous semaglutide 2.4 mg (n=263) or placebo (n=266) for 52 weeks. Semaglutide in the treatment group was first initiated at a dose of 0.25 mg and further titrated to the maintenance dose (2.4 mg) by week 16. Dual primary endpoints are the change in the Kansas City Cardiomyopathy Questionnaire clinical summary score (KCCQ-CSS) and the percentage change in body weight over the treatment period. Confirmatory secondary endpoints including changes in the 6-minute walk distance and the hierarchical composite endpoints were also analyzed.

A significant increase in KCCQ-CSS by 16.6 points was observed in the semaglutide group compared with the placebo group at week 52 (estimated difference = 7.8 points; 95% confidence interval [CI], 4.8 - 10.9; P<0.001). Participants receiving weekly semaglutide injection were also found to have a mean body weight reduction of -13.3% while the mean body weight change was 2.6% in the placebo group (estimated difference = -10.7 percentage points; 95% confidence interval [CI], -11.9 - -9.4; P<0.001). Assessments on the confirmatory secondary endpoints also demonstrated the efficacy of subcutaneous semaglutide on exercise function in obese HFpEF patients. Fewer serious adverse events were reported in the semaglutide group (13.3%) than in the placebo group (26.7%).

To summarize, once weekly subcutaneous semaglutide at a dose of 2.4 mg is effective to alleviate heart failure-related symptoms and promote weight loss in obese HFpEF patients.

Source: www.nejm.org

"1+" Mechanism for Hong Kong New Drug Registration Comes Effective on November 1, 2023

Date: October 26, 2023

According to the Pharmacy and Poisons Ordinance (Cap. 138) and existing guidelines, pharmaceutical products containing new chemical or biological entities (NCE) must satisfy the safety, efficacy, and quality criteria for registration before being sold or supplied in Hong Kong. Additional documentary proof with official registration approvals in at least 2 or more reference countries is also required to expedite the evaluation process by the Drug Office of the Department of Health.

The "1+" mechanism was proposed in "The Chief Executive's 2023 Policy Address" in October 2023. Under the new scheme, pharmaceutical products containing NCEs for life-threatening or severely debilitating diseases supported by local clinical data will be allowed to register conditionally in Hong Kong by the submission of one registration approval from any of the reference drug regulatory authorities. Applications submitted under this new arrangement will be evaluated on a case-by-case basis, provided that the pharmaceutical product intended for registration has a local unmet medical need.

The establishment of the "1+" mechanism starting from November 1st, 2023, is expected to allow Hong Kong to be more proactive in facilitating new drug approval so that patients can gain early access to drugs in long run.

Source: www.drugoffice.gov.hk

Osimertinib-Chemotherapy Regimen Prolongs Progression-Free Survival in Patients with EGFR-Mutated Advanced Non-Small Cell Lung Cancer

Date: November 8, 2023

Patients with advanced non-small cell lung cancer (NSCLC) are often genetically tested for the presence of molecular derangements before choosing their subsequent treatment plans. Osimertinib is a third-generation epidermal growth factor receptor-tyrosine kinase inhibitor (EGFR-TKI) that has been widely used as the first-line treatment against metastatic NSCLC carrying EGFR exon 19 deletion, T790M or L858R mutations. Other chemotherapeutic options are considered only when disease progression is observed during EGFR-targeted therapy.

In this phase 3, international and open-label FLAURA2 trial, 557 patients with locally advanced or metastatic non-squamous NSCLC are randomized in a 1:1 ratio to receive oral osimertinib 80 mg once daily plus pemetrexed and a platinum-based agent intravenously (n=279) or oral osimertinib 80 mg once daily only (n=278). The osimertinib-chemotherapy group was given the chemotherapy on day 1 of the 21-day cycle for 4 cycles, followed by pemetrexed maintenance therapy every 3 weeks despite daily osimertinib intake. Tumor assessments were conducted in week 6, 12 and then every 12 weeks from randomization until disease progression. The primary endpoint was investigator-assessed progression-free survival, whereas the objective response and medication safety were also investigated.

The osimertinib-chemotherapy group was observed to have a significantly longer overall investigator-assessed progression-free survival than the osimertinib monotherapy group (hazard ratio=0.62; 95% confidence interval [CI], 0.49-0.79; P<0.001). Consistent results were also applicable when participants were classified into different subgroups according to their sex, race, type of EGFR mutation and the presence of central nervous system metastases. Reports of grade 3 or higher adverse events from any cause in the osimertinib-chemotherapy group (64%) were more notable than the osimertinib group (27%), yet these can be explained by the established profiles of individual chemotherapy agents used in the study.

The concurrent use of osimertinib and chemotherapy significantly improves progression-free survival in patients with EGFR-mutated advanced NSCLC, especially for patient groups with poor prognosis.

Source: www.nejm.org

Apixaban Reduces Stroke Risk in Subclinical Atrial Fibrillation Patients, but Raises Bleeding Concerns

Date: November 12, 2023

Subclinical atrial fibrillation is asymptomatic or only produces short-lasting, nonspecific symptoms. This type of atrial fibrillation is difficult to diagnose by standard clinical means but is typically detected by using long-term continuous cardiac rhythm monitors. This condition is associated with a 2.5-fold increase in the risk of stroke, but the benefits of initiating oral anticoagulant treatments remain uncertain.

The ARTESIA double-blind, double-dummy, randomized trial was conducted at 247 clinical sites across 16 European and North American countries to evaluate whether apixaban would result in a lower risk of stroke or systemic embolism than aspirin, among patients with subclinical atrial fibrillation as detected by a pacemaker, defibrillator, or implantable cardiac monitor (ICM). Patients were randomly assigned to receive either apixaban 5 mg twice daily (2.5 mg twice daily when indicated) or aspirin 81 mg once daily. The primary efficacy outcome, stroke or systemic embolism incidence, was assessed in the intention-to-treat population and the primary safety outcome, major bleeding, was assessed in the on-treatment population.

A total of 4012 patients (2015 in the apixaban group and 1997 in the aspirin group) with a mean (±SD) age of 76.8±7.6 years and a mean CHA2DS2-VASc score of 3.9±1.1 were included in the analysis. After a mean follow-up of 3.5±1.8 years, stroke or systemic embolism occurred in 55 patients in the apixaban group (0.78% per patient-year) and in 86 patients in the aspirin group (1.24% per patient-year) (hazard ratio, 0.63; 95% confidence interval [CI], 0.45 to 0.88; P=0.007). In the on-treatment population, the rate of major bleeding was 1.71% per patient-year in the apixaban group and 0.94% per patient-year in the aspirin group (hazard ratio, 1.80; 95% CI, 1.26 to 2.57; P=0.001). Fatal bleeding occurred in 5 patients in the apixaban group and 8 patients in the aspirin group.

In conclusion, among patients with subclinical atrial fibrillation, apixaban resulted in a lower risk of stroke or systemic embolism than aspirin but is associated with a higher risk of major bleeding.

Source: www.nejm.org

FDA Approves LetsGetChecked's Simple 2 Test: The First At-Home Diagnostic Test for Chlamydia and Gonorrhea

Date: November 15, 2023

On November 15th 2023, the U.S. Food and Drug Administration (FDA) granted marketing authorization to LetsGetChecked for the Simple 2 Test, the first at-home diagnostic test for chlamydia and gonorrhea. Available over-the-counter, the diagnostic test is intended for use in adult patients aged 18 years and older to detect the presence of bacteria Chlamydia trachomatis and Neisseria gonorrhoeae through samples collected at home using vaginal swabs and urine specimens.

The direct-to-consumer test requires the user to activate the collection kit online and fill out a health questionnaire, which would be evaluated by a healthcare provider. After collecting the sample at home, the specimen is sent back to the designated laboratory for testing. Results are delivered online, with follow-up from a healthcare provider in cases of positive or invalid test results.

According to the Centers for Disease Control and Prevention's Sexually Transmitted Infections Surveillance Report, chlamydia and gonorrhea are the most common bacterial STIs in the United States, with rates steadily increasing. In 2021 alone, there were an estimated 1.6 million cases of chlamydia and more than 700,000 cases of gonorrhea. When left untreated, these infections can lead to serious health complications, including infertility. Expanding the availability of STI testing can help patients receive quicker results and access appropriate treatment, potentially curbing the rising rates of STIs.

The Simple 2 Test is the first FDA-authorized diagnostic test with at-home sample collection for any sexually transmitted disease other than HIV. The test and collection kit were validated for use with the cleared Hologic Aptima 2 Combo Assay. The FDA reviewed the Simple 2 Test under its De Novo premarket review pathway and established special controls for labeling and performance testing to ensure safety and effectiveness.

Source: www.fda.gov

Promising Results for mRNA-1345 Vaccine in Preventing Respiratory Syncytial Virus (RSV) in Older Adults

Date: December 14, 2023

Respiratory syncytial virus (RSV) poses a significant threat to older adults, which often leads to severe complications and even death. A phase 1 clinical trial of an mRNA-based RSV vaccine, mRNA-1345, encoding the stabilized RSV prefusion F glycoprotein has shown promising results, but further data are required.

The ongoing ConquerRSV trial is a randomized, double-blind, placebo-controlled study involving 35,541 adults 60 years of age or older in 22 countries. In this phase 2-3 trial, participants were randomly assigned in a 1:1 ratio to receive a single dose of mRNA-1345 (50 μg) or placebo. The study's primary efficacy endpoints were the prevention of RSV-associated lower respiratory tract disease with at least two or three signs or symptoms and the secondary efficacy endpoint was the prevention of RSV-associated acute respiratory disease. Safety evaluations were also conducted.

Out of the total participants, 17,739 participants received the mRNA-1345 vaccine while 17,748 received the placebo. The median follow-up was 112 days. The primary efficacy analyses were conducted once at least 50% of the expected RSV-associated lower respiratory tract disease cases had occurred. The vaccine demonstrated an efficacy rate of 83.7% (95% confidence interval [CI], 66.0 to 92.2) in preventing RSV-associated lower respiratory tract disease with at least two signs or symptoms and 82.4% (95% CI, 34.8 to 95.3) in preventing the disease with at least three signs or symptoms. Furthermore, the vaccine displayed an efficacy rate of 68.4% (95% CI, 50.9 to 79.7) in preventing RSV-associated acute respiratory disease. The vaccine's protection was consistent across age groups and individuals with coexisting conditions. Regarding safety, the mRNA-1345 group experienced a higher incidence of solicited local and systemic adverse reactions compared to the placebo group (58.7% vs 16.2% and 47.7% vs 32.9%) respectively. However, these reactions were mostly transient and mild to moderate in severity. The occurrence of serious adverse events was similar between the vaccine and placebo groups, affecting 2.8% of participants in each group.

In conclusion, the mRNA-1345 vaccine, administered as a single dose, demonstrated a favourable safety profile and significantly reduced the incidence of RSV-associated lower respiratory tract disease and RSV-associated acute respiratory disease in adults aged 60 years and older.

Source: www.nejm.org

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VIATRIS 暉致

Conversations with Pharmacy Leaders in Hong Kong – Skills for Success: Lateral Thinking, Confidence, & The Three Rs

CHAN, Stephanie Nok-Yan[a]; CHOW, Tiffany Hoi-Yee[b]; CHONG, Donald Wing-Kit[a]*

[a] *Haleon (GSK Consumer Healthcare Ltd.), 23/F, Tower 6, The Gateway, 9 Canton Road, Tsim Sha Tsui, Kowloon, Hong Kong SAR, China (*Corresponding author)*

[b] *Viatris Healthcare Hong Kong Limited., Suites 2401-07 & 12, 24/F, One Island East, 18 Westlands Road, Quarry Bay, Hong Kong SAR, China*

ABSTRACT

Professor Ian Wong, currently the Head of Department of Pharmacology & Pharmacy at The University of Hong Kong, shares his secret to his success as a pharmacist, educator, and researcher. After establishing his career as a pharmacist focusing on research in the U.K., Professor Wong returned to Hong Kong in 2011 to be close to his family. At the same time, he continued his research on ADHD, which has shaped the medical field's understanding of methylphenidate (Ritalin). Named "the father of healthcare big data research in Hong Kong" by Lancet Psychiatry, Professor Wong collaborated with other healthcare professionals to set up the Centre for Safe Medication Practice and Research. He utilized his knowledge and skills in big data to monitor the safety of COVID-19 vaccines, which earned him a commendation from the Chief Executive of Hong Kong in 2022. In this interview article, Professor Wong shares his thoughts and experiences, hoping to provoke the next generation of pharmacists to think out of the box.

Keywords: *Lateral Thinking, Pharmacy Education and Research, Big Data*

INTERVIEW WITH PROFESSOR IAN WONG

When asked why he chose to become a pharmacist, Professor Wong shared that he was the first person in his family to attend university. Although he did not excel academically at a young age, he was always interested in physics, chemistry, and biology, so he wanted to pursue a degree and career that would allow him to learn and apply his scientific knowledge. Pharmacy is a medical field where he can utilize his scientific knowledge and also with job security, so he felt it was only logical for him to study pharmacy in Sunderland, U.K.

Reviewing his academic journey, Professor Wong mentioned that universities overseas focus more on understanding, whereas schools in Hong Kong focus more on exam techniques and memorizing. The two vastly different learning experiences influenced his view of education and shaped his vision as an educator. Traditionally, professors put a strong emphasis on attendance for lectures, which is a form of massive information transfer. While 100% attendance may increase a student's chance of getting good grades, it is not the only determinant. Instead of focusing on lecture attendance, he believes educators should be "learning focused" - to help students learn and achieve their learning outcomes. An educator should act as a "catalyst" to drive students to think about new ideas or initiatives and what they can improve on. His vision of education led to his participation in Hong Kong University's Lead for Life program - which aims to teach undergraduate students about leadership skills and cultivate leaders who can use their potential to positively impact society.

When asked about the secret behind his success, Professor Wong shared that he holds one main thought - "**The Three Rs**" - close to his heart.

RESPECT is defined as a deep admiration or esteem for someone or something, recognizing their worth, value, and dignity. Professor Wong strongly believes in treating others with kindness, consideration, and appreciation. He emphasizes the importance of each and every individual in our society - everybody has their responsibility. An example given was janitors, who work tirelessly day and night to keep our public areas and streets clean, greatly contribute to public health. Without proper hygiene, many infectious diseases that are no longer considered a threat to public health would be out of control, putting a heavier strain on not only the healthcare industry but the entire Hong Kong community.

RESILIENCE is the ability of an individual to cope with adversity, adapt to change, and bounce back from challenging situations - and turn these situations into opportunities for growth and development.

To build resilience, Professor Wong shares his tips "**NEVER**", which stands for Network, Embrace change, Vision, Enjoyment, and Reflect. Network refers to your friends and family who will be your backup force during crisis. Also, as pharmacists, we should always network with people from different backgrounds in order to facilitate the sharing of knowledge and collaborations,

which could lead to novel and innovative ideas. Secondly, as the world is constantly moving forward, it is crucial to embrace change. Many people do not know or understand why change occurs - but if changes are unavoidable, why not change for the better? When you feel miserable, recall your vision and calling in life. These can give you the direction and energy to carry on. Moreover, in a society emphasizing efficiency and performance, we should never forget to stop and enjoy the little things in life. Lastly, we should regularly reflect on our actions instead of just listening to others' comments. Learning from our mistakes and identifying weaknesses can allow us to grow.

The life events of Professor Wong illustrate the essence of resilience and how to grasp the opportunities arising from changes. When he started his career in the Medicines and Healthcare Products Regulatory Agency (MHRA), he was introduced to the concept of pharmacovigilance and the use of electronic medical records. At that time, electronic records were very new, marking a new future for medical research and drug safety. In the time of constant development and growth of big data in research, Professor Wong was able to adapt and use it to grow as a researcher. As clinical trials are often difficult to conduct in pediatric populations and mental health, he came up with the idea to use big data to further research interests and generate new knowledge for the scientific community.

An example of utilizing big data to generate new knowledge would be one of his publications in *The Lancet Psychiatry* on the *risk of self-harm after the diagnosis of psychiatric disorders in Hong Kong*, which is the first attempt at investigating the risk of self-harm after a first-recorded diagnosis of psychiatric disorder in a Chinese population. Results revealed that those who were diagnosed with psychiatric disorders are significantly associated with an elevated risk of self-harm, and patients with a history of substance misuse or dependence were identified to have the highest risk. The research evidence can inform the development of more effective and targeted preventive measures in psychiatric care management, with special attention provided to patients who may be at a higher risk of engaging in self-harm.

A more recent example of Professor Wong's research is using big data to help monitor the safety of COVID-19 vaccines. In the past, Professor Wong did not do much research in vaccine. When asked what gave him the push to participate in the safety monitoring of COVID-19 vaccines, Professor Wong simply said, "I see the need, and I can do it, so why not?" Also, he mentioned the concept of "Lateral Thinking". People usually strive to run straight towards the goal and overcome all the hurdles along the road, but there are actually other alternative paths on the side that can lead to your goal. "**Lateral thinking**" involves thinking outside the box and looking at problems from new angles to gain insights and find innovative solutions. This concept gave him the drive and confidence to utilize the data for public health.

RESOLUTENESS is being determined, unwavering, and steadfast in one's decisions, beliefs, and goals. This particular attribute highlights the importance of having a strong sense of purpose and commitment, and being persistent in the face of obstacles.

In terms of research, Professor Wong mentioned that since the Center of Safe Medication Practice and Research is a "live" center, the research agenda changes constantly. However, the philosophy stays the same - to improve patient health and quality of life through interdisciplinary collaborative research. He strongly believes that academics should always work together with practicians to discuss whether the ongoing research is relevant to real-world practices, and vice versa. Professor Wong spent the past decade focusing on medication use in children diagnosed with ADHD. Although many people do not believe that ADHD is real, he is steadfast in his belief. He sticks to his vision that medication research is important to look at the best way to provide individualized care to newly diagnosed children, or those who do not respond effectively to methylphenidate. Through his big data research, he has shaped our knowledge and understanding of methylphenidate (Ritalin).

Finally, when asked what he would like to share with current or aspiring pharmacists, Professor Wong shared that many people may not see the importance of a pharmacist within our society. However, as pharmacists, we can determine how we influence society. It is normal that humans tend to form habits and routines because when we repeat the same thing, our brains will start to form circuits, and efficiency will increase. However, we will become more rigid as we only repeat the same things we know over and over again. Limiting ourselves within the circuits, then there will be no innovations and breakthroughs. Professor Wong encouraged us to step out of the circuits by learning one skill or piece of knowledge and trying to practice it. For example, something as simple as reading one leadership book per year and take one important take home message to practice. Within a few years, we would have gained a few new thinking and good habits that greatly influence our skills as an individual.

CONCLUSION

Professor Ian Wong shares two ideas - "The Three Rs" and "NEVER" - that have helped him thrive as a pharmacist, educator, and researcher. He shares his experience in the U.K. and Hong Kong, and how they have shaped his views and vision throughout the years. Finally, he closes with the thought on how everyone can determine how they influence society through self-improvement, thinking outside the box, and most importantly, by believing in themselves.

Author's background
CHAN, Stephanie Nok-Yan *is currently a Pharmacy Intern at Haleon (GSK Consumer Healthcare). For enquiries, please contact her through the email address: stephanie.x.chan@haleon.com*
CHOW, Tiffany Hoi-Yee *is currently a Pharmacy Intern at Viatris Healthcare Hong Kong Limited. For enquiries, please contact her through the email address: tiffanyhychow@gmail.com*
CHONG, Donald Wing-Kit *is currently the Regulatory Affairs Director, Consumer Health at Haleon (GSK Consumer Healthcare) in Hong Kong. For enquiries, please contact him through the email address: donald.w.chong@haleon.com*

Safety and efficacy of high-potency statin in Chinese patients with established cardiovascular disease

TANG, HO Yeung[1]; LAU, Kai Cheong[1]; YAN, Bryan P.[2]; LEE, Vivian W.Y.[3]*

[1] School of Pharmacy, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong SAR, China

[2] Division of Cardiology, Department of Medicine and Therapeutics, Prince of Wales Hospital, Li Ka Shing Institute of Health and Sciences, Institute of Vascular Medicine, The Chinese University of Hong Kong, Hong Kong SAR, China

[3] Centre for Learning Enhancement And Research, The Chinese University of Hong Kong, Hong Kong SAR, China

ABSTRACT

Clinical guidelines recommend the use of high-intensity statins in patients with acute coronary syndrome (ACS). Yet, most clinical trials were conducted in mainly Caucasian population. This study investigated the relationship between statin intensity (low, moderate or high potency), low-density lipoprotein cholesterol (LDL-C) goal attainment and safety outcomes within 1 year of statin therapy in Chinese ACS patients. A retrospective study was conducted at the Prince of Wales Hospital during 1 August 2010 to 13 November 2014. Efficacy outcomes include percentage LDL reduction, target lesion revascularization (TLR) and ACS-related accident & emergency department (AED) readmission. Composite safety outcomes include myopathy, liver function test derangement and impaired glycemic control were evaluated. A total of 357 ACS patients were recruited. Low-, moderate- and high-intensity statins can achieve 21% (95% CI: 11.1% to 30.9%), 32.8% (95% CI: 26.9% to 38.7%), 57.8% (95% CI: 48.1% to 67.4%) LDL-C reduction respectively. Using high-intensity statins is more likely than moderate-intensity statins to achieve ≥50% LDL-C reduction respectively (OR: 9.437, 95% CI: 4.028 to 22.107) (p < 0.0001). High-intensity statins are more likely to achieve LDL-C <1.8mmol/L than moderate-intensity statins (OR: 6.398, 95% CI: 2.716 to 15.072) (p < 0.0001). Low-intensity statins are not significantly different from moderate-intensity to achieve LDL-C <1.8mmol/L (OR: 0.559, 95% CI: 0.305 to 1.026) (p = 0.061). The relationship between statin intensity and LDL-C goal attainment was adjusted for age, gender, smoking status, alcohol consumption, family history of ACS, baseline LDL-C and regular exercise of subjects. High-intensity statin users were more likely than moderate-intensity statin users to have impaired fasting blood glucose and Haemoglobin A1C (OR: 2.495, 95% CI: 1.048 to 5.94; OR: 2.805, 95% CI: 1.143 to 6.883) (p = 0.039; p = 0.024). A total of 42 (11.8%) TLR or ACS-related AED readmission were recorded. There was no significant difference in the composite endpoint between low-potency statin users and moderate-potency statin users (OR 0.61, 95% CI 0.24-1.55, P=0.298) or between high-potency statin users and moderate-potency statin users (OR 0.42, 95% CI 0.09-1.92, P=0.263). High-intensity statins are more likely than moderate-intensity statins to have impaired fasting blood glucose (OR: 2.495, 95% CI: 1.048 to 5.94; p= 0.039) and HbA1c (OR: 2.805, 95% CI: 1.143 to 6.883; p = 0.024). The present study showed that high-intensity statins result in greater LDL-C reduction and more adverse effects than statins of lower intensity. However, statin intensity and LDL-C goal attainment have no significant effects on the incidence and time-to-event of the efficacy outcomes.

Keywords: *Acute coronary syndrome, Lipid management, statins, Low-density cholesterol, Safety, Efficacy.*

INTRODUCTION

Serum LDL level is known to be associated with atherosclerotic cardiovascular disease (ASCVD) including acute coronary syndrome (ACS) for decades.[1,2] HMG-CoA reductase inhibitors (statins) are commonly used drugs to lower serum LDL cholesterol (LDL-C) level to prevent ASCVD. In recent years, international guidelines recommend more stringent LDL-C levels. In US, for patients that have a history of ASCVD, the new guideline recommends the use of high-intensity statin for secondary prevention, which on average reduces LDL-C

by at least 50%.[3] In European and Canadian guidelines base their recommendations on "the lower, the better" approach. These guidelines recommend targeting a very low absolute LDL-C level with statins to reduce the total cardiovascular risk. Both guidelines recommend an LDL-C target of less than 1.8 mmol/L for very high-risk patients including patients with history of ASCVD.[4,5] In our previous pilot study, Hong Kong patients were using statin doses lower than recommended for secondary prevention of ASCVD in western guidelines but did not automatically translate into worse clinical outcomes.[6] Similar findings were observed in Korean and Japanese studies[7,8,9] All these findings lead to a doubt of whether taking high-intensity statins is beneficial for Chinese or Asian patients for secondary prevention of ASCVD. In addition, since majority of the subjects involved in the clinical trials of statin therapy which are taken into consideration by treatment guidelines are Caucasians, the efficacy of achieving absolute LDL-C level of < 2.6 and 1.4 mmol/L recommended by western guidelines should be further studied in local eastern situation.

Statins are one of the safest cholesterol-lowering drugs, but still there are concerns regarding their risk of hepatotoxicity, increased risk of myopathy and increased risk of new onset of diabetes mellitus (DM). For hepatotoxicity, the National Institute of Health Guidelines defined drug-induced liver injury by alanine aminotransferase (ALT) level of three times the upper limit of normal (ULN). However, the actual incidence of elevated ALT level is rare. As reported by a meta-analysis published in 2003, the incidence of ALT elevation more than three times ULN was found to be 1.3% with statins and 1.1% with placebo with no case of acute liver failure.[10] Another commonly reported adverse effect of statins is statin-associated muscle symptoms (SAMS). Statistics from patient registries and clinical experience show that 7% to 29% of patients complain of SAMS.[11-15] However, in randomized controlled trials, the incidence of SAMS is substantially lower than that reported in observational studies. In The Effects of Statins on Muscle Performance (STOMP) study, 9.4% of the naïve atorvastatin 80mg-treated and 4.6% of control subjects met the study definition of myalgia after 6 months.[16] This may indicate the problem of lacking a consensus on the definitions of SAMS. Therefore, the European Atherosclerotic Society (EAS) published a consensus statement on SAMS in 2015. **Table 1** lists out the definitions of SAMS proposed by EAS.[17] As for the increased new onset of DM after taking statins, there are evidence that statins can modestly increase plasma glucose level. A meta-analysis combining 13 studies with total 91,140 patients shows that it takes treating 255 patients with statins for 4 years to have one extra case of new onset DM.[18] Thus, statins provide excellent benefit-to-risk profile in preventing ASCVD. Despite the safe profile of statins, there are still some concerns about the safety of targeting very low LDL-C level with statin therapy. One study found that there is an increased risk of non-cardiovascular death in very aggressive treatment to LDL of less than 40 mg/dL (~1.03 mmol/L).[19] Another study, which is a post-hoc analysis of JUPITER trial found that more diabetes mellitus, hematuria, hepatobiliary disorders, and insomnia were resulted when targeting LDL of less than 30 mg/dL (~0.78 mmol/L).[20] Based on the above findings, some research gaps are identified for further investigation more specifically in the Chinese population. As a result, this study aimed to investigate whether high-intensity statins are safe and efficacious in the Hong Kong Chinese population.

METHODS

This study was a retrospective observational cohort study. The study site was at the Prince of Wales Hospital (PWH). Patients naive to statins who were admitted to PWH due to ACS and had out-patient follow-up at the Cardiology Clinic of PWH are the target population. The actual sample includes the cohort of patients in the target population who were newly started on statin with an index date from 1 August 2010 to 13 November 2014. The list of patients was acquired through the Clinical Data Analysis and Reporting System (CDARS). Included subjects should be naïve to statin therapy and are required to have at least one year of unchanged statin therapy after the index date. Patients taking drugs that interact with statins with clinical significance are excluded because the interacting drugs may affect the LDL-C control or affect the incidence of myopathy, liver function test derangement or new-onset DM. Clinically significant interactions with statins are defined according to a review article.[21] Only when the interaction meets the criteria of clinical significance will the case be excluded. Examples of drugs that can induce secondary dyslipidemia include corticosteroids, anabolic steroids, progestins and protease inhibitors.[22] Patients taking these drugs concurrently with statins should be excluded because secondary dyslipidemia may affect the control of LDL-C by statins. On the other hand, some diseases can also induce secondary dyslipidemia. Examples include nephrotic syndrome, hypothyroidism, obstructive liver disease and chronic renal failure requiring hemodialysis and transplantation.[22] Apart from the above, patients who have documented fatty liver or non-alcoholic steatohepatitis (NASH) are excluded because they can also cause liver function test (LFT). Included subjects were then classified based on four criteria – statin intensity, achievement of ≥50% LDL-C reduction in one year and achievement of ultra-low LDL-C level (<1.8 and 2.6 mmol/L) after one year. Among the sub-groups under each category, efficacy and safety outcomes were compared. During the study period, the latest LDL-C goal of 1.4 mmol/L was not published yet, therefore, we evaluated the impact of the target of LDL-C goal of 1.8 mmol/L.

Table 1. Patients' Demographics

	Overall (N=357)	High-potency statins (N=42)	Moderate-potency statins (N=246)	Low-potency statins (N=69)	P-value
Demographic characteristic / Family history of ACS					
Gender - Male - Female	 268 (75.1%) 89 (24.9%)	 35 (83.3%) 7 (16.7%)	 186 (75.6%) 60 (24.4%)	 47 (68.1%) 22 (31.9%)	0.187
Mean age at index event	66.6 ± 11.8	60 ± 10	66.3 ± 11.5	71.7 ± 11.6	<0.0001
Mean BMI (n)	25.5 ± 3.27 (n= 50)	25.0 ± 2.97 (n = 10)	25.9 ± 3.42 (n = 31)	24.3 ± 3 (n = 9)	0.383
Family history of ACS - Yes - No - Unknown	 7 (2.0%) 10 (2.8%) 340 (95.2%)	 2 (4.8%) 2 (4.8%) 38 (90.5%)	 4 (1.6%) 8 (3.3%) 234 (95.1%)	 1 (1.4%) 0 (0%) 68 (98.6%)	0.201
Lifestyle					
Smoking history - Active smoker - Ex-smoker - Non-smoker - Unknown	 96 (26.9%) 87 (24.4%) 157 (44.0%) 17 (4.8%)	 15 (35.7%) 5 (11.9%) 20 (47.6%) 2 (4.8%)	 70 (28.5%) 60 (24.4%) 103 (41.9%) 13 (5.3%)	 11 (15.9%) 22 (31.9%) 34 (49.3%) 2 (2.9%)	0.091
Alcohol drinking history - Active drinker - Social drinker - Ex-drinker - Non-drinker - Unknown	 27 (7.6%) 12 (3.4%) 6 (1.7%) 144 (40.3%) 168 (47.1%)	 6 (14.3%) 1 (2.4%) 0 (0%) 14 (33.3%) 21 (50.0%)	 17 (6.9%) 9 (3.7%) 5 (2.0%) 97 (39.4%) 118 (48.0%)	 4 (5.8%) 2 (2.9%) 1 (1.4%) 33 (47.8%) 29 (42.0%)	0.717
Regular exercise - Yes - No - Unknown	 33 (9.2%) 9 (2.5%) 315 (88.2%)	 5 (11.9%) 3 (7.1%) 34 (81.0%)	 22 (8.9%) 5 (2.0%) 219 (89.0%)	 6 (8.7%) 1 (1.4%) 62 (89.9%)	0.326
At index event					
Index event					<0.0001
STEMI	142 (39.8%)	27 (64.3%)	98 (39.8%)	17 (24.6%)	
NSTEMI	132 (37.0%)	9 (21.4%)	97 (39.4%)	26 (37.7%)	
Unstable angina	83 (23.2%)	6 (14.3%)	51 (20.7%)	26 (37.7%)	
Mean baseline LDL-C	3.03 ± 0.905	3.84 ± 1.04	3.04 ± 0.822	2.51 ± 0.72	<0.0001
Coronary catheterization - Yes - No	 304 (85.2%) 53 (14.8%)	 40 (95.2%) 2 (4.8%)	 213 (88.6%) 33 (13.4%)	 51 (73.9%) 18 (26.1%)	0.005
Primary PCI - Yes - No	 246 (85.2%) 111 (14.8%)	 34 (81.0%) 8 (19.8%)	 176 (71.5%) 70 (28.5%)	 36 (52.2%) 33 (47.8%)	0.002
Primary CABG - Yes - No	 20 (5.6%) 337 (94.4%)	 3 (7.1%) 39 (92.9%)	 12 (4.9%) 234 (95.1%)	 5 (7.2%) 64 (92.8%)	0.550
Thrombolytic - Yes - No	 52 (14.6%) 305 (305%)	 10 (23.8%) 32 (76.2%)	 34 (13.8%) 212 (86.2%)	 8 (11.6%) 61 (88.4%)	0.175
Comorbidities / Past medical history					
Hypertension - Yes - No	 177 (49.6%) 180 (50.4%)	 14 (33.3%) 28 (66.7%)	 115 (46.7%) 131 (53.3%)	 48 (69.6%) 21 (30.4%)	<0.0001
Hyperlipidemia - Yes - No	 72 (20.2%) 285 (79.8%)	 8 (19.0%) 34 (81%)	 55 (22.4%) 191 (77.6%)	 9 (13.0%) 60 (87%)	0.230
Diabetes mellitus - Yes - No	 52 (14.6%) 305 (85.4%)	 1 (2.4%) 41 (97.6%)	 36 (14.6%) 210 (85.4%)	 15 (21.7%) 54 (78.3%)	0.020
Past ACS - Yes - No	 18 (5.0%) 339 (95%)	 3 (7.1%) 39 (92.9%)	 12 (4.9%) 234 (95.1%)	 3 (4.3%) 66 (95.7%)	0.697
Past CVA - Yes - No	 10 (2.8%) 347 (97.2%)	 0 (0.00%) 42 (100%)	 9 (3.7%) 237 (96.3%)	 1 (1.4%) 68 (98.6%)	0.468
CHF - Yes - No	 11 (3.1%) 346 (96.9%)	 0 (0.00%) 42 (100%)	 10 (4.1%) 236 (95.9%)	 1 (1.4%) 68 (98.6%)	0.385
PAD - Yes - No	 1 (0.3%) 356 (99.7%)	 0 (0.00%) 42 (100%)	 1 (0.4%) 245 (99.6%)	 0 (0.00%) 69 (100%)	1.000

BMI = Body-mass index, STEMI = ST-elevation myocardial infarction, NSTEMI = non-ST elevation myocardial infarction, PCI = Percutaneous coronary intervention, CABG = Coronary artery bypass grafting, CVA = cerebrovascular accidents (including stroke or TIA), CHF = Congestive heart failure, PAD = Peripheral arterial disease. *Values of continuous variables are reported as mean ± standard deviation. Categorical variables are reported as n (%).

The primary outcomes of the current study included the change of LDL-C levels and the safety outcomes related to the use of statin therapy. The LDL-C level measured during admission was collected as baseline LDL level. The LDL-C level measured between 12 months after admission was collected. The percentage of LDL-C reduction was calculated by baseline LDL and 1-year LDL. 1-year LDL was used to determine whether the patient attained an absolute LDL target such as <2.6mmol/L or <1.8mmol/L. The safety outcomes related to the use of statin therapy included derangement of LFT, muscle symptoms, elevation of serum creatine kinase (CK) levels and new onset of fasting blood glucose (FBG) elevations. Derangement of LFT was defined as elevated liver transaminase (more than 3 times the upper limit of normal) on 2 or more occasions.[23,24] Both reported muscle symptoms and elevation of serum CK to more than 10 times the upper limit of normal (ULN) were measured since these two presentations are regarded as myopathy when they happen concurrently.[24] New-onset Type-2 diabetes mellitus was measured as new-onset FBG ≥7mmol/L or new-onset HbA1c≥6.5%. Due to the very low incidence of adverse effects in our pilot study, a composite endpoint of all the above adverse effects was tested.

The secondary outcomes included the time-to- target lesion revascularization (TLR) and time to ACS related Accident & Emergency Department (AED) readmission (time-to-AED) were collected. Survival analyses on time-to-TLR and time-to-AED were performed for each target %LDL reduction (10%, 20%, 30%, 40%, 50%, 60% and 70%) by comparing the group attaining the goal and the group not attaining. Target lesion revascularization is defined as repeated percutaneous coronary intervention (PCI) that was done to previously stented vessel. TLR was done when the patient was admitted due to clinical symptoms or restenosis was found in previously stented vessel during repeated coronary angiography.

STATISTICAL ANALYSIS

Baseline comparison, categorical baseline characteristics were expressed in percentage proportions while numerical continuous characteristics were expressed in mean ± standard deviation. Chi-square test or Fisher's exact test was used to investigate the association between categorical baseline characteristics and study sub-groups. One-way ANOVA with subsequent post-hoc comparisons or independent sample t-test was used to compare the means of numerical continuous characteristics among different study sub-groups. For primary outcome analysis, mean percentage LDL-C reduction among study sub-groups were compared using two-way ANOVA to adjust for interaction from other covariates. The relationship between binary categorical outcomes and their predictors are analyzed using binary logistic regression to control for other covariates. For secondary outcome analysis, Kaplan-Meier survival curves and log-rank tests are used to compare the time-to-secondary outcome among different LDL-C goal attainment. All statistical tests are based on level of significance of 5% (α= 0.05). Microsoft Excel 2010 and IBM SPSS Statistics 22 were adopted for statistical analysis in this study.

RESULTS

A total of 592 patient records were reviewed and among them 235 cases were excluded based on the exclusion criteria **(Figure 1)**. Therefore, the final recruited patients were 357 for the current study. Baseline characteristics between groups of statin potencies were compared in **Table 1**. The mean age, type of index event, mean baseline LDL-C, rate of coronary catheterization, rate of percutaneous coronary intervention (PCI), rate of preexisting hypertension and rate of preexisting diabetes mellitus were significantly different among the group of high-potency, moderate-potency, and low-potency statin. No significant differences in other baseline characteristics were detected among the three groups. Binary logistic regression demonstrated that statin intensity has a significant impact on the probability of achieving ≥50% LDL-C reduction from baseline after 1 year of statin therapy. Using low- and high-intensity statins is less likely and more likely than moderate-intensity statins to achieve ≥50% LDL-C reduction respectively (OR: 0.212, 95% CI: 0.09 to 0.498; OR: 9.437, 95% CI: 4.028 to 22.107) (p < 0.0001; P < 0.0001). As covariates, it is found that active smokers are less likely than non-smokers to achieve ≥50% LDL-C reduction (OR: 0.362, 95% CI: 0.177 to 0.742) (p = 0.005). Age (OR: 0.996, 95% CI: 0.972 to 1.02) (p = 0.734), gender (OR: 0.991, 95% CI: 0.514 to 1.912) (p = 0.979), alcohol consumption (p = 0.789) and regular exercise (p = 0.522) have no significant effect on the probability of achieving ≥50% LDL-C reduction. Regarding the LDL-C goal of < 1.8 mmol/L, high-intensity statins are more likely to achieve LDL-C <1.8mmol/L than moderate-intensity statins (OR: 6.398, 95% CI: 2.716 to 15.072) (p < 0.0001). However, low-intensity statins are not significantly different from moderate-intensity to achieve the goal (OR: 0.559, 95% CI: 0.305 to 1.026) (p = 0.061). Apart from statin intensity, baseline LDL-C also has a significant effect on the probability of achieving the LDL-C goal (OR: 0.479, 95% CI: 0.355 to 0.647) (p < 0.0001). In other words, it is less likely to achieve LDL-C <1.8 mmol/L with higher baseline LDL-C. Active smokers are also less likely to achieve the goal compared to non-smokers (OR: 0.46, 95% CI: 0.242 to 0.872) (p = 0.017).

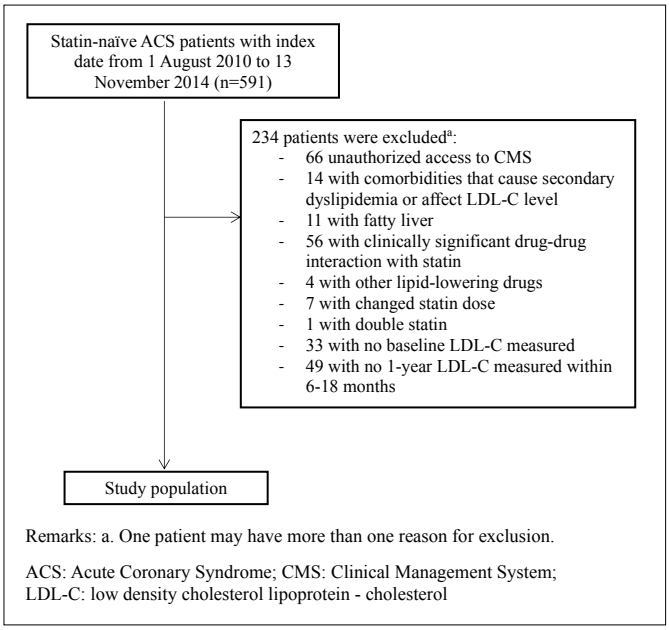

***Figure 1**: Study flow*

The safety outcomes related to statin therapy in the current study is summarized in **Table 2**. There were none or only very limited number of cases with CK >10 ULN, muscle symptoms and LFT derangement (defined as ALT >3ULN on 2 or more occasions). A composite endpoint of liver function test derangement, muscle symptoms, elevated creatine kinase (>10 ULN), new-onset impaired fasting blood glucose (FBG≥7mmol/L) or new-onset HbA1c (≥6.5%) was used in logistic regression. High-potency statin users were more likely to have either one of the above adverse effects than moderate-potency statin users (OR 2.86, 95% CI 1.33-6.18, P=0.007). However, there was no significant difference between low-potency and moderate potency (OR 0.83, 95% CI 0.40-1.72, P=0.613). In addition, the effect of statin potency on fasting blood glucose and HbA1c was separately studied after excluding the patients with pre-existing diabetes mellitus. High-potency statin was more likely to cause new-onset impaired FBG (≥7mmol/L) than moderate-intensity statin (OR 2.50, 95% CI 1.05-5.94, P=0.039). However, there was no significant difference between the effect of low-potency and moderate-potency statin (OR 0.96, 95% 0.40-2.31, P=0.924). Regarding HbA1c, high-potency statin was more likely to cause new-onset impaired HbA1c (≥6.5%) than moderate-potency statin (OR 2.80, 95% CI 1.14-6.89, P=0.024) but there was no significant difference between low-potency statin and moderate-potency statin (OR1.22, 95% CI 0.54-2.79, P=0.635). High-intensity statin users were more likely than moderate-intensity statin users to have impaired fasting blood glucose (OR: 2.495, 95% CI: 1.048 to 5.94) (p = 0.039). Low-intensity statin users were not significantly different from moderate-intensity in likelihood of causing impaired FBG (OR: 0.958, 95% CI: 0.398 to 2.305) (p = 0.924). It is found that achievement of LDL-C <2.6mmol/L, <1.8mmol/L and ≥50% LDL-C reduction from baseline have no significant effects on the incidence of impaired fasting BG in patients without prior history of DM (OR: 1.308, 95% CI: 0.416 to 4.111; OR: 1.123, 95% CI: 0.605 to 2.087; OR: 1.391, 95% CI: 0.687 to 2.814) (p = 0.646; p = 0.713; p = 0.359).

The cardiovascular outcomes in this study included TLR and ACS-related AED re-admission within 1 year of statin therapy. Logistic regression shows that achievement of ≥50% LDL-C reduction has no significant effect on the probability of TLR (OR: 1.344, 95% CI: 0.229 to 7.873) (p = 0.743) and ACS-related AED re-admission (OR: 0.561, 95% CI: 0.224 to 1.405) (p = 0.217) within 1 year of statin therapy. The same result appears in the composite outcome of TLR or ACS-related AED re-admission (OR: 0.79, 95% CI: 0.347 to 1.8) (p = 0.574).

Table 2. The safety outcomes related to statin therapy.

		Statin			Total (n=357)
		High-potency (n=42)	**Moderate- potency (n=246)**	**Low-potency (n=69)**	
Deranged LFT	Yes	0 (0%)	3 (1.2%)	0 (0%)	3 (0.8%)
	No	42 (100%)	243 (98.8%)	69 (100%)	354 (99.2%)
Muscle symptoms	Yes	0 (0%)	1 (0.4%)	0 (0%)	1 (0.3%)
	No	42 (100%)	245 (99.6%)	69 (100%)	356 (99.7%)
Elevated creatine kinase	Yes	0 (0%)	1 (0.4%)	0 (0%)	1 (0.3%)
	No	42 (100%)	245 (99.6%)	69 (100%)	356 (99.7%)
New-onset Impaired FBG	Yes	13 (31%)	37 (15.0%)	9 (13.0%)	59 (16.5%)
	No	28 (66.7%)	173 (70.3%)	45 (65.2%)	246 (58.9%)
	Having pre-existing DM	1 (2.4%)	36 (14.6%)	15 (21.7%)	52 (14.6%)
New-onset Impaired HbA1c	Yes	11 (26.2%)	31 (12.6%)	11 (15.9%)	53 (14.8%)
	No	30 (71.4%)	179 (72.8%)	43 (62.3%)	252 (70.6%)
	Having pre-existing DM	1 (2.4%)	36 (14.6%)	15 (21.7%)	52 (14.6%)

LFT: liver enzyme test; FBG: fasting blood glucose; DM: diabetes mellitus; HbA1c: Hemoglobin A1c

DISCUSSION

The current project confirmed that statin intensity has significant effect on attainment of some of the LDL-C goals of patients. It was shown that high-intensity statins are more likely than moderate-intensity statins to achieve ≥50% LDL-C reduction. Secondly, high-intensity statins are also more likely than moderate-intensity statins to achieve the absolute LDL-C goal of <1.8mmol/L. However, low-intensity statins are not significantly different from moderate-intensity statins to achieve LDL-C <1.8mmol/L. However, statin intensity has no significant effect on the probability of achieving absolute LDL-C goal of <2.6mmol/L. This may be explained by all statin intensity groups have similarly high likelihood in achieving LDL-C of <2.6mmol/L since it is not a very aggressive target. Hence there is no significant difference in the probability of goal attainment of LDL-C <2.6mmol/L. Apart from statin intensity, baseline LDL-C is shown to significantly affect the probability of achieving absolute LDL-C goal of <2.6 and <1.8mmol/L. Similar findings were observed in a Taiwanese retrospective study.[25] With increasing baseline LDL-C, it is less likely to achieve the two absolute LDL-C goals since the percentage LDL-C reduction required would become larger and make the goal attainment more difficult. Hence, for all statin intensity groups, baseline LDL-C is also an important covariate of the absolute LDL-C goal attainment.

The current study confirmed that LDL-C goal attainment of ≥50% reduction, <2.6mmol/L and <1.8mmol/L did not have significant effects on the incidence of impaired FBG. Yet, it showed that high-intensity statin users were more likely to result in impaired FBG and HbA1c than moderate-intensity statins. Ex-smokers also had significantly lower likelihood of having impaired FBG than non-smokers. The cause-and-effect relationship between statin therapy and impaired glycemic control is well documented. It was shown in a meta-analysis that 9% (OR: 1.09, 95% CI 1.02 to 1.17) more patients receiving statins were diagnosed with DM than those receiving placebo.[18] However, the incidence of new DM due to statins was very low. The meta-analysis also showed that it takes treating 255 (95% CI: 150 to 852) patients for 4 years to detect 1 extra case of DM.[18] In addition, a cross-sectional study showed the positive association between aging and elevated HbA1c levels after adjusting for gender, BMI, FBG, and 2-hour post-load glucose values.[26] From linear regression, it was found that for every 1 unit increase in age, HbA1c level increases for 0.012 units in non-diabetic patients. This is consistent with the findings of the present study. Past epidemiologic and cross-sectional studies showed that smoking can induce insulin resistance.[27-29] Several studies showed that current smokers have higher HbA1c levels than non-smokers, regardless of ethnicity.[30-35] However, it was shown in a multi-ethnic and multi-centre cross-sectional study that there is no significant difference in FBG among never-smokers, ex-smokers, and current smokers for fasting blood glucose.[36] Another meta-analysis involving over 35,000 patients also show that there is no significant difference in FBG between current and never-smokers.[37] These results are different from what has been found in the present study probably because of the large and unexplained heterogeneity of the effects in different populations.

For the safety outcomes, it was found that high-intensity statins are more likely than moderate-intensity statins to result in the composite adverse effects of CK elevation >10 ULN, muscle symptoms, LFT derangement and impaired glycemic control in the current study. Previously, a meta-analysis showed that the incidence of CK elevation >10 ULN is only 1 per 1000 to 1 per 10000 people per year.[38] In addition, The Effects of Statins on Muscle Performance (STOMP) study shows that 9.4% of atorvastatin 80mg-treated patients versus 4.6% placebo-treated patients developed myalgia.[16] Therapeutically, most patients complained of statin-associated muscle symptom (SAMS) with one statin can tolerate another statin well.[14,39] Therefore, SAMS may not be generalized to other statins and may even have other causes apart from statins. For LFT derangement, large trials of statins involving more than 48,000 patients have shown that there is no significant difference in the incidence of ALT > 3 ULN in statin group versus placebo group.[23] Same with SAMS, LFT derangement usually subsides if the statin is continued without interruption.[40] In the present study, only 3 cases of LFT derangement were detected and all of them were in the moderate-intensity group. It is worth to note that most patients in Hong Kong were in the moderate-intensity group.

In the current study, no significant effect was observed for the time-to-TLR and time-to-AED readmission among the three target LDL-C goals. For TLR, it was previously demonstrated that the overall incidence of TLR after PCI with drug-eluting stent is 3.8% at 2 years and 82.5% of the TLR occur within the first year after stenting.[41] There is also a study regarding incidence rate of TLR in the Chinese Han population. The incidence of TLR as shown is numerically higher than that in western population.[42] At only 7 months after drug-eluting stent implantation, there are already 5.5% patients have TLR. However, in the present study, there are only 7 cases of TLR in the whole sample of 357 patients within the follow-up period of 1 year (incidence rate = 1.96%), which indicates that the incidence rate of TLR is generally lower in the current study. Therefore, either a larger sample size or longer follow-up period is required to have more cases in each comparison group for an accurate comparison of time-

to-TLR using Kaplan-Meier analysis because study has shown that Kaplan-Meier analysis is likely inaccurate in small number of cases.[43] Therefore, no conclusive results can be obtained for the effect of LDL-C goal attainment on time-to-TLR in our Chinese population from the present study.

For ACS-related AED readmission, a large clinical study in the United States showed the incidence rate and time-to-event of ACS-related AED readmission within 1 year after starting statin therapy was 6.8% with a mean time-to-event of 4.9 months.[44] In the present study, the overall incidence rate is 10.4% (37 cases over 357 subjects) with a mean time-to-event of 87.4 days. Therefore, the incidence rate found in the current study in the study population was higher than the previously published US population. The mean time-to-event was also shorter numerically than the US population. But for the effect of LDL-C goal attainment on time-to-event, the number of readmissions in each comparison group was too small that led to inconclusive relationship between LDL-C goal attainment and time-to-A&E readmission in the current study.

Several limitations exist in the present study. Firstly, this was a single-centre study in one of the major acute public hospitals in Hong Kong. The results may not truly reflect the actual safety and efficacy profile of different intensities of statins and LDL-C goals in Hong Kong or Chinese population. Secondly, information including medication adherence and lifestyle modifications could not be obtained from the consultation notes of physicians with the retrospective nature of the study. Thirdly, a subject selection bias may exist in the present study because only subjects who remained on the same statin regimen throughout the 1-year therapy were included. Therefore, subjects who have switched their therapies due to unresponsiveness or over-responsiveness of their statin therapies were excluded. As a result, our analysis may over-estimate the efficacy of lower intensity statins & underestimate the efficacy of higher intensity statins.

CONCLUSION

The present study showed that high-intensity statins result in greater LDL-C reduction and more adverse effects than statins of lower intensity. However, statin intensity and LDL-C goal attainment have no significant effects on the incidence and time-to-event of the efficacy outcomes.

Conflict of Interest:

All authors declared that there was no conflict of interest during the study and the preparation of the manuscript.

Author's background

TANG, Ho Yeung *is a Pharmacy Student of the School of Pharmacy, Faculty of Medicine of the Chinese University of Hong Kong*

LAU, Kai Cheong *is a Pharmacy Student of the School of Pharmacy, Faculty of Medicine of the Chinese University of Hong Kong*

Prof. YAN Bryan P *is Professor of the Division of Cardiology, Department of Medicine and Therapeutics, Prince of Wales Hospital, Li Ka Shing Institute of Health and Sciences, Institute of Vascular Medicine, The Chinese University of Hong Kong*

Prof. Vivian WY Lee*, Pharm.D., BCPS (AQ Cardiology) is Associate Professor of the Centre for Learning Enhancement And Research, The Chinese University of Hong Kong. Address reprint requests to Professor Vivian W.Y Lee at : vivianlee@cuhk.edu.hk.*

References

1. Wilson, P. W. High-density lipoprotein, low-density lipoprotein and coronary artery disease. *The American journal of cardiology* 1990;*66*(6): A7-A10.
2. Rossouw, J. E., Lewis, B., & Rifkind, B. M. The value of lowering cholesterol after myocardial infarction. *New England Journal of Medicine* 1990; *323*(16): 1112-1119.
3. Stone, N. J., Robinson, J. G., Lichtenstein, A. H., Merz, C. N. B., Blum, C. B., Eckel, R. H., ... & McBride, P. 2013 ACC/AHA guideline on the treatment of blood cholesterol to reduce atherosclerotic cardiovascular risk in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Journal of the American College of Cardiology* 2014; *63*(25_PA): 2889-2934.
4. Reiner, Ž., Catapano, A. L., De Backer, G., Graham, I., Taskinen, M. R., Wiklund, O., & Erdine, S. ESC/EAS Guidelines for the management of dyslipidaemias. *European heart journal* 2011; *32*(14): 1769-1818.
5. Anderson, T. J., Grégoire, J., Hegele, R. A., Couture, P., Mancini, G. J., McPherson, R., ... & Genest, J. 2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. *Canadian Journal of Cardiology* 2013; *29*(2): 151-167.
6. Lee VWY, Chau RYH, Cheung HYH, Lam YY, Yu CM, Yan BPY. Does the low LDL goal improve survival for Acute Coronary Syndrome patients in Hong Kong? BMC Cardiovascular Disorders 2015;15:117:DOI:10.1186/s12872-05-0117-y.
7. Cho KH, Jeong MH, Park KW, Kim HS, Lee SR, Chae JK, Hong YJ, Kim JH, Ahn Y, Cho JG, Park JC, KAMIR (Korean Acute Myocardial Infarction Registry) Investigators. Comparison of the effects of two low-density lipoprotein cholesterol goals for secondary prevention after acute myocardial infarction in real-world practice:≥ 50% reduction from baseline versus< 70mg/dL. International journal of cardiology, 2015. 187: p. 478-485.
8. Kim H S, Lee H, Lee S H, Jeong YJ, Kam TM, Yang SJ, Baik SJ, Kim H, Lee SH, Cho JH, Choi IY, Yoon KH, Kim JH. Use of Moderate-Intensity Statins for Low-Density Lipoprotein Cholesterol Level above 190 mg/dL at Baseline in Koreans. Basic & Clinical Pharmacology & Toxicology, 2017.
9. Hamazaki T, Okuyama H, Ogushi Y, Hama R. Towards a Paradigm Shift in Cholesterol Treatment. Ann Nutr Metab, 2015. 66(4): p. 1-116.
10. Law MR, Wald NJ, & Rudnicka AR. (2003). Quantifying effect of statins on low density lipoprotein cholesterol, ischaemic heart disease, and stroke: systematic review and meta-analysis. *BMJ*, *326*(7404), 1423.
11. Bruckert E, Hayem G, Dejager S, Yau C, & Bégaud B. (2005). Mild to moderate muscular symptoms with high-dosage statin therapy in hyperlipidemic patients—the PRIMO study. *Cardiovascular Drugs and Therapy*, *19*(6), 403-414.
12. Buettner C, Rippberger, MJ, Smith J K, Leveille SG, Davis RB, & Mittleman MA. (2012). Statin use and musculoskeletal pain among adults with and without arthritis. *The American journal of medicine*, *125*(2), 176-182.
13. Cohen JD, Brinton EA, Ito MK, & Jacobson TA. (2012). Understanding Statin Use in America and Gaps in Patient Education (USAGE): an internet-based survey of 10,138 current and former statin users. *Journal of clinical lipidology*, *6*(3), 208-215.

14. Zhang H, Plutzky J, Skentzos S, Morrison F, Mar P, Shubina M, & Turchin A. (2013). Discontinuation of statins in routine care settings: a cohort study. *Annals of internal medicine*, *158*(7), 526-534.

15. El-Salem K, Ababneh B, Rudnicki S, Malkawi A, Alrefai A, Khader Y, Saadeh R & Saydam M. (2011). Prevalence and risk factors of muscle complications secondary to statins. *Muscle & nerve*, *44*(6), 877-881.

16. Parker BA, Capizzi JA, & Grimaldi AS. (2013). Effect of statins on skeletal muscle function. *Circulation*, *127* (1), 96-103.

17. Stroes ES, Thompson PD, Corsini A, Vladutiu, GD, Raal FJ, Ray KK, Roden M, Stein E, Tokgözoğlu L, Nordestgaard BG, Bruckert E, De Backer G, Krauss RM, Laufs U, Santos, RD, Hegele RA, Hovingh GK, Leiter LA, Mach F, and the European Atherosclerosis Society Consensus Panel. (2015). Statin-associated muscle symptoms: impact on statin therapy—European Atherosclerosis society consensus panel statement on assessment, aetiology and management. *European heart journal*, *36*(17), 1012-1022.

18. Sattar N, Preiss D, Murray HM, Welsh P, Buckley BM, de Craen A J, Seshasai SRK, McMurray JJ, Freeman DJ, Jukema JW, Macfarlane PW, Packard CJ, Stott DJ, Westendorp, RG, Shepherd J, Davis BR, Pressel SL, Marchioli R, Marfisi RM, Maggioni AP, Tavazzi L, Tognoni G, Kjekshus J, Pedersen TR, Cook TJ, Gotto AM, Clearfield MB, Downs JR, Nakamura H, Ohashi Y, Mizuno K, Ray KK, Ford I. (2010). Statins and risk of incident diabetes: a collaborative meta-analysis of randomised statin trials. *The Lancet*, *375*(9716), 735-742.

19. Muhlestein JB, May HT, Lappé DL, Bair TL, Le VT, & Anderson JL. (2014). How Low Should You Go in Secondary Prevention Treatment of LDL-C: Observational Insights from the Intermountain Heart Collaborative Study. *Circulation*, *130*(Suppl 2), A14994-A14994.

20. Everett BM, Mora S, Glynn RJ, MacFadyen J, & Ridker PM. (2014). Safety profile of subjects treated to very low low-density lipoprotein cholesterol levels (< 30 mg/dl) with rosuvastatin 20 mg daily (from JUPITER). *The American journal of cardiology*, *114*(11), 1682-1689.

21. Cupp M. (2012). Clinically Significant Statin Drug Interactions. *Pharmacist's Letter*, *28* (6), 280606.

22. National Institutes of Health. (2001). Third Report of the National Cholesterol Education Program Expert Panel on detection, evaluation, and treatment of high blood cholesterol in adults (Adult Treatment Panel III). *Executive Summary. Bethesda, MD, National Institutes of Health, National Heart, Lung and Blood Institute (NIH publ. no. 01-3670)*.

23. Sikka P, Saxena KK, & Kapoor S. (2011). Statin Hepatotoxicity: Is it a Real Concern? *Heart views*, *12*(3), 104.

24. Davidson CS, Leevy CM, Chamberlayne EC, editors. Guidelines for Detection of Hepatotoxicity Due to Drugs and Chemicals. Fogarthy Conference, 1978. NIH publication no. 79-313. Washington, DC: US Government Printing Office; 1979.

25. Su MI, Tsai CT, Yeh HI, & Chen CY. (2014). Factors Associated with Lipid Goal Attainment among Patients with Deployed Drug Eluting Stent. *ACTA CARDIOLOGICA SINICA, 30*(4), 325-332.

26. Pani LN, Korenda L, Meigs JB, Driver C, Chamany S, Fox CS, Sullivan L, D'Agostino RB & Nathan DM. (2008). Effect of Aging on A1C Levels in Individuals Without Diabetes Evidence from the Framingham Offspring Study and the National Health and Nutrition Examination Survey 2001–2004. *Diabetes care*, *31*(10), 1991-1996.

27. Manson JE, Ajani UA, Liu S, Nathan DM, & Hennekens CH. (2000). A prospective study of cigarette smoking and the incidence of diabetes mellitus among US male physicians. *The American journal of medicine*, *109*(7), 538-542.

28. Attvall S, Fowelin J, Lager I, Schenck H, & Smith U. (1993). Smoking induces insulin resistance—a potential link with the insulin resistance syndrome. *Journal of internal medicine*, *233*(4), 327-332.

29. Eliasson B, Attvall S, Taskinen MR, & Smith U. (1994). The insulin resistance syndrome in smokers is related to smoking habits. Arteriosclerosis, *Thrombosis, and Vascular Biology, 14*(12), 1946-1950.

30. Cho NH, Chan JC, Jang HC, Lim S, Kim HL, & Choi SH. (2009). Cigarette smoking is an independent risk factor for type 2 diabetes: a four-year community-based prospective study. *Clinical endocrinology*, *71*(5), 679-685.

31. Nilsson PM, Lind L, Pollare T, Berne C, & Lithell HO. (1995). Increased level of hemoglobin A1c, but not impaired insulin sensitivity, found in hypertensive and normotensive smokers. *Metabolism*, *44*(5), 557-561.

32. Urberg M, Shammas R, & Rajdev K. (1989). The effects of cigarette smoking on glycosylated hemoglobin in nondiabetic individuals. *Journal of family practice*, *28*(5), 529-531.

33. Clair C, Bitton A, Meigs JB, & Rigotti NA. (2011). Relationships of Cotinine and Self-Reported Cigarette Smoking With Hemoglobin A1c in the US Results from the National Health and Nutrition Examination Survey, 1999–2008. *Diabetes care*, *34*(10), 2250-2255.

34. Sargeant LA, Khaw KT, Bingham S, Day NE, Luben RN, Oakes S, Welch A, & Wareham NJ. (2001). Cigarette smoking and glycaemia: the EPIC-Norfolk Study. *International Journal of Epidemiology, 30*(3), 547-554.

35. Jansen H, Stolk RP, Nolte IM, Kema IP, Wolffenbuttel BHR, & Snieder H. (2013). Determinants of HbA1c in nondiabetic Dutch adults: genetic loci and clinical and lifestyle parameters, and their interactions in the Lifelines Cohort Study. *Journal of internal medicine*, *273*(3), 283-293.

36. Berlin I, Lin S, Lima JA, & Bertoni AG. (2012). Smoking status and metabolic syndrome in the multi-ethnic study of atherosclerosis. A cross-sectional study. *Tobacco induced diseases*, *10*(1), 9.

37. Soulimane S, Simon D, Herman WH, Lange C, Lee CM, Colagiuri S, Shaw JE, Zimmet PZ, Magliano D, Ferreira SRG, Dong Y, Zhang L, Jorgensen T, Tuomilehto J, Mohan V, Christensen, DL, Kaduka L, Dekker JM, Nijpels G, Stehouwer CDA, Lantieri O, Fujimoto WY, Leonetti DL, McNeely MJ, Borch-Johnsen K, Boyko EJ, Vistisen D, Balkau B and DETECT-2 Study Group. (2014). HbA1c, fasting and 2 h plasma glucose in current, ex-and never-smokers: a meta-analysis. *Diabetologia*, *57*(1), 30-39.

38. Law M, & Rudnicka AR. (2006). Statin safety: a systematic review. *The American journal of cardiology*, *97*(8), S52-S60.

39. Mampuya WM, Frid D, Rocco M, Huang J, Brennan DM, Hazen SL, & Cho L. (2013). Treatment strategies in patients with statin intolerance: the Cleveland Clinic experience. *American heart journal*, *166*(3), 597-603.

40. Maiese LM. (2010). The statin hepatotoxicity myth. *Heartbeat*, *145*, 1-2.

41. Al Muradi H, Mehra A, Okolo J, Vlachos H, Selzer F, Marroquin OC, Skelding K, Holper EM, Williams DO & Abbott JD. (2012). Clinical presentation and predictors of target vessel revascularization after drug-eluting stent implantation. *Cardiovascular Revascularization Medicine*, *13*(6), 311-315.

42. Xu B, Li JJ, Yang YJ, Ma WH, Chen JL, Qiao SB, Qin XW, Yao M, Liu H, Wu YJ, Yuan JQ, Chen J, You SJ, Dai J, Xia R and Gao RL. (2006). A single center investigation of bare-metal or drug-eluting stent restenosis from 1633 consecutive Chinese Han ethnic patients. *Chinese medical journal*, *119*(7), 533-538.

43. Goel M, Khanna P, & Kishore J. (2010). Understanding survival analysis: Kaplan-Meier estimate. *International journal of Ayurveda research*, *1*(4), 274.

44. Arnold SV, Smolderen KG, Kennedy KF, Li Y, Shore S, Stolker JM, Wang TY, Jones PG, Zhao Z & Spertus JA. (2015). Risk factors for rehospitalization for acute coronary syndromes and unplanned revascularization following acute myocardial infarction. J*ournal of the American Heart Association*, *4*(2), e001352.

CE Questions Answer for 302(D&T)

Review of Monoclonal Antibodies for the Treatment of Crohn's Disease

1. C 2. D 3. A 4. C 5. B 6. D 7. C 8. B 9. A 10. B

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The Activities of the Society of Hospital Pharmacists

SHPHK – 2023 Year End Wrap Up

With all COVID-19 restrictions now lifted, activities of the Society of Hospital Pharmacists of Hong Kong (SHPHK) have almost been resumed to full normalcy. In 2024, we will continue to organize different continuing education activities, as well as social activities for our Members.

If you have any suggestions on how we could improve in 2024, or have any innovative ideas for how we could facilitate the advancement of pharmacy service in Hong Kong together, please do not hesitate to let us know!

Activities Highlights: October - December 2023

SHPHK Press Conference and Media Group Interview

An SHPHK press conference regarding flu vaccination was held on 26th October 2023. The aim of this press conference is to raise public awareness of the potential serious flu outbreak in this winter without COVID-19 mask mandate.

SHPHK press conference (flu vaccination) on 26th October 2023.

On 6th December 2023, SHPHK also hosted a media group interview on pneumococcal vaccine, hoping to update the general public about the latest recommendations of the use of pneumococcal vaccine in Hong Kong by the Scientific Committee on Vaccine Preventable Diseases, Department of Health.

We would like to thank Mr. So Yiu Wah, Vice President of SHPHK for representing the Society to attend the above-mentioned press events despite his busy schedule.

SHPHK media group interview (pneumococcal vaccines) on 6th December 2023.

SHPHK Webinars

In Q4, SHPHK has organised a webinar on concentrated insulin and three 'Broaden your horizons' webinars on various topics, including co-care of community and hospital pharmacists, critical care pharmacy and radiopharmacy. We would like to thank our pharmacist colleagues of different sectors for sharing their invaluable experience regarding their daily work with our Members, as well as our General Committee Members and Intern Members for helping to chair the webinars.

SHPHK Activities: 2023 In Review

January	1.	網上講座: 認識止痛藥物及服用注意事項
February	2.	Webinar: Ambulatory Care Clinic Pharmacist Practice – Understanding the Local Lanscape (Co-organised with LKS Faculty of Medicine, Department of Pharmacology and Pharmacy, The University of Hong Kong)

March	3.	Webinar: Brand verse Generic Medications in Psychiatry (Supported by The Hong Kong College of Psychiatrists)
	4.	Ambulatory Care Service: Physician - Pharmacist Collaborative Anticoagulation Clinic (Co-organised with College of Pharmacy Practice)
June	5.	Webinar: New Breakthrough in treatment – Gene Therapy and Radio-ligand Therapy
July	6.	AGM Seminars: - Challenge and Opportunity of Medication Safety in A&E - From Manual to Prefilled Preparation: A Blessing to all?
	7.	The 36th SHPHK Annual General Meeting
August	8.	講座:「揭開藥劑師的神秘面紗」
October	9.	Webinar: Broaden your horizons #1 - Co-Care of Community Pharmacists and Hospital Pharmacists
	10.	Webinar: Concentrated Insulin in Current Clinical Practice
November	11.	Webinar: Broaden your horizons #2 - Reality Versus Expectation: Being the First Critical Care Pharmacist in Hong Kong
December	12.	Webinar: Broaden your horizons #3 - Radiating Excellence: Unveiling the Value of Radiopharmacists in an Evolving Specialty
	13.	Movie Night: Wish
Coming in 2024! (TBC)	-	SHPHK webinars / seminars: 'Broaden your horizons' series, lectures on treatment updates, dinner symposium, etc. - BBQ - …and more!

The SHPHK Movie Night is Back!

Apart from educational activities, SHPHK also organises different social events, hoping to provide a networking platform for Members to connect and communicate.

On 23rd December 2023, SHPHK will host a movie night at Grand Windsor Cinema, Causeway Bay. This time, we will be watching the movie 'Wish' together.

Tickets are limited and going quickly! Free popcorn and drinks will be served on a first come, first served basis. This free event is open to SHPHK Members only. Each SHPHK member may bring one friend or relative who can also enjoy the same benefits! If you have not joined SHPHK as a Member yet, you may join online at: www.shphk.org.hk.

Change of SHPHK premises name

Recently, the SHPHK premises name has officially been changed from 'SHPHK Clubhouse' to 'SHPHK Office', and minor office renovation has been completed. This decision is made to enhance the professional image of SHPHK and promote the status of pharmacy professional, and was endorsed by the General Committee (GC) Members of SHPHK in the GC meeting on 28th November 2023.

In the future, the main purposes of the SHPHK office would be to provide a place for:

1. GC members or members to hold SHPHK or pharmacy-related meetings;
2. SHPHK staff to maintain the daily operation of the Society; and
3. SHPHK to organise educational events, including drug and health talks, HCP seminars or workshops, SHPHK press conferences and media interviews for professional development in Hong Kong.

SHPHK Membership Renewal

SHPHK Members will receive a reminder email from us very soon if their membership is due to renew. Please make sure your membership with SHPHK is up-to-dated so that you could continue to get free access to SHPHK online resources and join the Society's activities for free in 2024!

Please note that the SHPHK 3-year membership package will no longer come with free Lexicomp account as it has come to our attention that most of our Members have already had free access to Lexicomp via the subscription of their own institutions. However, SHPHK Members can choose to continue to subscribe to Lexicomp at a discounted rate (SHPHK Members exclusive offer!) as required. More details regarding different SHPHK membership subscription packages will be announced in due course. Please stay tuned!

SHPHK Whatsapp Channel

To enhance member engagement and ensure timely communication, SHPHK will be launching its whatsapp channel in 2024. In the future, Members can opt to receive Society's news via whatsapp.

We strongly recommend Members to join the whatsapp channel so that you will be able to get easy access to the notifications about the Society's upcoming lectures, webinars and events directly on your smartphone.

Members should receive an email from our membership officer to explain the details of the new whatsapp channel very soon.

As 2023 comes to an end, the GC Members of SHPHK would like to take this opportunity to thank all SHPHK Members for their support throughout the year. We wish you all a Merry Christmas and a prosperous year ahead!

You are most welcome to follow the Society's Facebook page (**@SHPHK**) and the SHPHK 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.

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Each tablet contains 180 mg bempedoic acid.

Administration
The recommended dosage of Nilemdo, in combination with maximally tolerated statin therapy, is 180 mg administered orally once daily with or without food.

Contraindications
None.

Interactions
Simvastatin: Avoid concomitant use of Nilemdo with simvastatin greater than 20 mg.

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Most common: upper respiratory tract infection, muscle spasms, hyperuricemia, back pain, abdominal pain or discomfort, bronchitis, pain in extremity, anemia, and elevated liver enzymes. Others include tendon rupture, gout, benign prostatic hyperplasia, atrial fibrillation.

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Nustendi contains bempedoic acid and ezetimibe. Nustendi reduces elevated LDL-C through inhibition of cholesterol synthesis in the liver and absorption in the intestine.

Bempedoic acid is an adenosine triphosphate-citrate lyase (ACL) inhibitor that lowers low-density lipoprotein

cholesterol (LDL-C) by inhibition of cholesterol synthesis in the liver. ACL is an enzyme upstream of 3-hydroxy-3-methyl-glutaryl-coenzyme A (HMG-CoA) reductase in the cholesterol biosynthesis pathway. Bempedoic acid and its active metabolite, ESP15228, require coenzyme A (CoA) activation by very long-chain acyl-CoA synthetase 1 (ACSVL1) to ETC-1002-CoA and ESP15228-CoA, respectively. ACSVL1 is expressed primarily in the liver. Inhibition of ACL by ETC-1002-CoA results in decreased cholesterol synthesis in the liver and lowers LDL-C in blood via upregulation of low-density lipoprotein receptors.

Ezetimibe reduces blood cholesterol by inhibiting the absorption of cholesterol by the small intestine. The molecular target of ezetimibe has been shown to be the sterol transporter, Niemann-Pick C1-Like 1 (NPC1L1), which is involved in the intestinal uptake of cholesterol and phytosterols. Ezetimibe localizes at the brush border of the small intestine and inhibits the absorption of cholesterol, leading to a decrease in the delivery of intestinal cholesterol to the liver. This causes a reduction of hepatic cholesterol stores and an increase in LDL receptors, resulting in clearance of cholesterol from the blood.

Indications

Nustendi is indicated as an adjunct to diet and maximally tolerated statin therapy for the treatment of adults with heterozygous familial hypercholesterolemia or established atherosclerotic cardiovascular disease who require additional lowering of LDL-C.

Dosage Forms and Strengths

Each tablet contains 180 mg bempedoic acid / 10 mg ezetimibe.

Administration

The recommended dosage of Nustendi, in combination with maximally tolerated statin therapy, is one tablet (180 mg bempedoic acid and 10 mg ezetimibe) orally once daily with or without food. Swallow the tablet whole.

Coadministration with Bile Acid Sequestrants: Administer Nustendi either at least 2 hours before or at least 4 hours after bile acid sequestrants.

Contraindications

Nustendi is contraindicated in patients with a known hypersensitivity to ezetimibe tablets. Hypersensitivity reactions including anaphylaxis, angioedema, rash and urticaria have been reported with ezetimibe.

Interactions

Simvastatin: Avoid concomitant use of Nustendi with simvastatin greater than 20 mg. Pravastatin: Avoid concomitant use of Nustendi with pravastatin greater than 40 mg. Cyclosporine: Monitor cyclosporine concentrations in patients receiving Nustendi and cyclosporine.

Fibrates: If cholelithiasis is suspected in a patient receiving Nustendi and fenofibrate, gallbladder studies are indicated and consider alternative lipid-lowering therapy.

Cholestyramine: Administer Nustendi either at least 2 hours before or at least 4 hours after bile acid sequestrants.

Adverse Reactions

Most common: upper respiratory tract infection, muscle spasms, hyperuricemia, back pain, abdominal pain or discomfort, bronchitis, pain in extremity, anemia, elevated liver enzymes, diarrhea, arthralgia, sinusitis, fatigue, and influenza. Others include tendon rupture, gout, benign prostatic hyperplasia, atrial fibrillation.

Dosage Available

Nustendi (bempedoic acid and ezetimibe) tablets 180 mg bempedoic acid /10 mg ezetimibe in the pack of 28's

Forensic classification

P1S1S3