AHKDN e-NEWSLETTER

香港糖尿科護士協會
Association of Hong Kong Diabetes Nurses

Issue 12 Feb • 2017

AHKDN web-site:http//www.ahkdn.com Email address: newsletter.ahkdn@hotmail.com

通訊顧問 ： 徐業成醫生 | 出版部主管 ： 林婉虹 | 編輯組 ： 鍾巧儀、關綺媚、劉秀蓮、梁逸思、蘇德宜、余舜華

Veronica Hung
President of AHKDN
2016-2018

It is our pleasure to kick starts electronic AHKDN Newsletter in 2017. The initiative of e-newsletter is not only to enhance the accessibility for our readers that they can search the newsletter at any time but also to protect our earth resource without printing. Now our readers only tip their finger on the AHKDN web **www.ahkdn.com** and all the news and information about AHKDN are ready on their eyes. The12th newsletter's theme is **"New Glycaemic Target on Elderly with Diabetes".** Aging population is increasing globally, and diabetes is the most common chronic disease that affecting their health and social life. As we all know managing diabetes in the elderly is challenging not only of the complex comorbid medical issues and generally lower functional status but also the psychosocial economic factors.

And we are glad to invite expertise Dr Au Yeung Tung Wai who has much clinical experience and innovative approach on caring diabetes elderly at hospital and community settings.

AHKDN newsletter all along keeps our readers up on the current global diabetes news and practice. This time we will discuss on NHS improvement: Patient safety alert - Risk of severe harm and death due to withdrawing insulin from pen devices published on 16 November 2016. The paper revealed on patient safety incidents involving staff using 100 U/mL insulin syringes to draw higher insulin strength directly from pen devices or refill cartridges. And we are diabetes nurses on this newsletter to state the suggestions on handling the insulin injection with pen devices or refill cartridges.

Diabetes mellitus in Old Age

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Introduction

Diabetes mellitus (DM) is a metabolic disorder characterized by elevation of glucose due to either insulin deficiency or resistance. However, it is not only pancreas islet beta-cell dysfunction but rather a multi-system disorder, which includes islet alpha-cell dysregulation, impaired incretin effect in the gut, increased lipolysis in the adipose tissue, increased glucose reuptake in the renal tubules, accelerated cognitive decline and muscle degeneration. The last two contribute to the pathogenesis of frailty syndrome in older persons. The degenerated alpha-cell function diminishes the counter-regulatory capacity in face of impending hypoglycaemia, which poses older persons at particularly high risk of hypoglycaemia. Fortunately, the development of incretin-based therapy and other pharmacological options in recent years can alleviate this problem. In this communication, the assessment in older persons with DM, the goals and targets of treatment and the rationale behind; and the management approach and preferred therapy will be discussed.

Assessment of DM older adults

DM being a multi-system disorder is a prototype of the frailty syndrome in old age. Therefore a comprehensive geriatric assessment approach is of particular relevance to DM. This approach includes multidimensional assessments, including, physical, mental, psychological and social domains. In particular, the following items are important. They are:

Cognition
Gait and balance
Frailty syndrome – gait speed and muscle strength
Vision
Mood
Social reserve
Hand dexterity (relevance for injection and haemoglucostix capacity)

Other standard risk assessment in general adults may not be relevant in older adults with long standing disease and established complications. If any protocol-driven regular assessment tool is to be designed, those items listed above will be relevant.

Goals of treatment

Tight glycaemic control is advocated for young and middle-aged patients to prevent long-term micro- and macro-vascular complications. However, it takes at least 5 years or more of intensive therapy to prevent micro-vascular and another 5 years or to avoid macro-vascular complications. The benefit of intensive glycemic control in people with short life expectancy, long-standing disease and established complications is doubtful. Therefore tight glycaemic control target is not the goal of treatment in older adults.

Instead, the alternative goals of treatment in older patients with DM are:

1. Prevent acute complications of profound hyperglycaemia

Profound hyperglycaemia, if not controlled, will lead to hyperosmolar crisis, negative energy balance or malnutrition, symptomatic polyuria, polydipsia and it invites infection, particularly in the urinary tract. Therefore, even in older patients, a very high glucose level is not desirable.

2. Avoid hypoglycaemia

Older adults are blunted in the autonomic response to hypoglycemia. The typical hypoglycaemic symptoms, like sweating, palpitation, agitation and hunger sensation are often absent, making asymptomatic hypoglycaemia very common in old age. Perhaps loss of conscience is the single recognizable clinical presentation when the glucose goes down dangerously low. However, a fainting attack may result in severe head injury and fractures. The impaired capacity of the counter-regulatory mechanism in particular the concomitant alpha-cell failure accelerates this risk. Nocturnal hypoglycaemia is again not uncommon and remains undetected. Another malignant complication of hypoglycemia, seldom been emphasized, is cardiac arrhythmias due to repolarization disorder, which may account for some sudden deaths in older DM adults.

Hypoglycaemia is often regarded as transient, reversible with glucose replacement and benign. However, this is not true, older people with multiple episodes of severe hypoglycaemia can run a much higher risk of suffering from dementia in a few year time.

The underlying mechanism is uncertain at present but some animal models have observed that induced hypoglycaemia in rats could damage the parts of the brain that were responsible for memory and learning. In addition, hypoglycaemia can precipitate platelet aggregation which can result in multiple micro-infarcts in the brain parenchyma.

In order to avoid hypoglycemia, there are some points to note and practical tips to follow.

a. Hypoglycaemia can blunt glucose counter-regulatory response to subsequent hypoglycaemia, leading to recurrent hypoglycaemia. Loose control for 2-3 weeks is advised for restoring the counter-regulatory response.

b. Infection related hyperglycemia may need escalation of insulin therapy during hospitalization to counteract the activation of stress hormones. This phase can be prolonged beyond the resolution of the crisis and therefore it is not uncommon that a patient is discharged with a higher insulin dosage. Prompt scaling down of insulin at post-discharge can avoid hypoglycemia. It is safer to allow a loose control on discharge.

c. Consider continuous glucose monitoring study when asymptomatic hypoglycaemia, which is common in old age, is suspected. The classical scenario is an HbA1c level below 7% but without any symptoms of hypoglycaemia.

d. Use anti-DM drugs with low hypoglycaemia propensity. They are:
   i. Metformin
   ii. Incretin-based therapy
   iii. Glucosidase inhibitor (low potency)
   iv. Long-acting basal insulin analogue

3. Delay frailty

Frailty is a syndrome of reduced resilience and reserve due to mutually exacerbating cycles of declines across multiple systems, which results in negative energy balance, sarcopenia, and diminished strength and tolerance to exertion. The underlying pathophysiology is overexpression of cytokines in immune system and the decline of the neuroendocrine system. Phenotypically, the person has accelerated weight loss (muscle loss), weak in muscle strength, slow in gait speed, easily becomes fatigue and low in physical activity level. Apart from these physical domains, cognitive decline has recently been regarded as part of the frailty syndrome, or termed as 'cognitive frailty''.

DM is associated adversely with muscle mass and strength, accelerating their decline in old age. Insulin resistance impaired protein uptake and synthesis and reduces capillary supply and perfusion in muscle. The activation of cytokines fasten muscle breakdown. DM is a wasting disease.

One local longitudinal study has revealed that older DM persons had a faster loss of total body weight, muscle mass and even fat mass. DM is also associated with Alzheimer Disease due to excess amyloid deposition with insulin resistance. In addition, the DM-associated micro-infarcts in the brain will hasten the clinical manifestation of Alzheimer Disease too. Putting both together, DM is a prototype disease related to frailty syndrome in old age. Therefore frailty identification should be instituted as a regular practice in the care of older DM patients.

At present, no pharmacological therapy is available to treat frailty though some agents based on myostatin inhibition to counteract sarcopenia are on the pipe line. Before that the importance of adequate nutrition could not be more emphasized. Regular resistance exercise and protein supplementation remains the mainstay of treatment for sarcopenia and frailty syndrome currently.

Glycaemic targets

Glycaemic control in older adults is highly individualized with various targets, and is particularly loosened in those with long-standing disease, established complications and co-morbidities and short life expectancy. The following table illustrates glycaemic targets in various patient types for reference.

Patient type	Patient characteristics / health status	HbA1c target	Fasting / preprandial glucose (mmol/L)	Bedtime glucose (mmol/L)
Healthy (longer life expectancy)	Few coexisting chronic illness, intact cognitive and functional status	< 7.5%	5 - 7.2	5 - 8.3
Complex/ intermediate (intermediate remaining life expectancy, high treatment burden, hypoglycaemia vulnerability, fall risk)	Multiple coexisting chronic illness or >2 instrumental ADL imparment or mild to moderate cognitive impairment	< 8%	5 - 8.3	5.6 - 10
Very complex/ poor health (Limited remaining life expectancy makes benefit uncertain)	Long term care/end-stage chronic illness, moderate to severe cognitive impairment, >2 ADL dependencies	< 8.5%	5.6 - 10	6.1 - 11.1

American Diabetes Association / American Geriatrics Society (2012) consensus guideline for glycaemia goal in elderly people with diabetes

Management approach

As discussed before, the treatment goals are:

1. Prevent acute complications of profound hyperglycemia
2. Avoid hypoglycaemia
3. Delay frailty

The prevention of chronic complications is not applicable if they have already established or in the presence of limited life expectancy. Nevertheless, for some very robust older adults with short disease duration, the prevention of long-term complication is still worthwhile.

Diet and weight control

The advantage of being slightly overweight in older people and also in DM older people has been observed in many cohort studies. Weight reduction should not be loosely advised to balance against compromising the pleasure of dinning and quality of life. Adequate nutrition is an essential intervention in preventing frailty. It is important to monitor any unintentional weight loss.

Self Monitoring of Blood Glucose (SMBG)

SMBG (usually by Old Age Home staff or family) should not be routinely advised to monitor post-prandial hyperglycaemia. The glycemic excursion is wide in older persons because of blunted insulin surge and therefore post-prandial hyperglycaemia may not indicate poor control. However SMBG is indicated to detect fasting or pre-meal hypoglycaemia.

Pharmacotherapy

1. Metformin is the preferred initial therapy if there is no contraindications (eGFR < 30 ml/min/1.73m^2 or at risk of lactic acidosis). It has good hypoglycemia safety profile. However, it is avoided older people who are underweight or having appetite problem.

2. Sulphonylurea is not the preferred therapy because of its high propensity of hypoglycaemia. If it has to be used , the short-acting group may minimize the risk of hypoglycaemia.

3. α-glucosidease inhibitor is safe for hypoglycaemia and is good for postprandial hyperglycaemia but the potency is low.

4. Adverse profile of thiazolidinedione with particular concerns in old age are: water retention, edema and heart failure, fragility fractures and possible bladder cancer.

5. Incretin-based therapies such as dipeptidyl peptidase-IV inhibitors and glucagon-like peptide receptor agonists have low risk of hypoglycaemia and are effective in counteracting post-prandial hyperglycaemia.

6. In general, insulin therapy for frail older adults should be simple and once or twice daily dose of intermediate acting insulin is sufficient. Long-acting basal insulin analogue (glargine and detemir) with stable basal level and least peak effect is particularly suitable for patients with risk of hypoglycaemia, and is the preferred therapy. Pre-prandial rapid-acting insulin analogue (lisopro and aspart), which are reserved only for those with wide glycaemic excursion. (profound post-prandial hyperglycaemia and recurrent nocturnal or pre-meal hypoglycaemia) may not usually be needed in older patients in whom tight control is not warranted. It could be problematic in patients with unreliable appetite and may not be feasible for old age home to match the meal time with the injection.

7. The safety profile of SGLT2 inhibitor in old age is awaited. However, its clinical application should be actively explored in the robust older patients who are cognitively competent to recognize and report any adverse effects, particularly urogenital infection.

Conclusions

The aims of DM control in older adults is preventing acute complication of hyperglycaemia, avoiding hypoglycaemia and delaying frailty. Prevention of long-term complication is often not the goal. Individualized HbA1c target is the current consensus. Hypoglycaemia is serious and can be avoided by specified strategy and preferred therapy. Safer medication is available to avoid hypoglycaemia. DM is a prototype of frailty syndrome in old age and is a wasting disease leading to early onset of frailty. Being overweight may not be bad for older people with DM and stabilization of body weight and muscle can delay frailty syndrome onset.

Patient Safety Alert
Risk of severe harm and death due to withdrawing insulin from pen devices

Veronica Hung
President of AHKDN 2016-18
Nurse Consultant (Diabetes) NTWC

NHS Improvement published patient safety alert on 16 November 2016 on patient safety incidents involving healthcare professionals using insulin syringes to withdraw insulin directly from pen devices or penfill. In fact, for the being-used insulin syringe graduations is 100 U/mL designed only for 100 units/mL insulin concentration. If insulin extracted from a pen or penfill is of a higher concentration with 100 U/mL insulin syringe, the dose withdrawn is actually overdose and it can lead to a significant and potentially fatal overdoses. For example, when you draw a 300 U/mL insulin concentration penfill with prescription 20 units, if withdrawn with insulin syringe, the actually drawn insulin dose is 60 units.

Common practice at ward settings that not suggested in the future



The report identifies the reasons of this practice of using insulin syringe to extract insulin in the pen devices are that staff have not had access to equipment for safely disposing of needles attached to pen devices and /or lack of training in the use of insulin pens. And the alert asks the healthcare providers to ensure staff have access to appropriate safety devices and training for administrating insulin with a pen device.

Apart from standard 100 unit/mL insulin concentration, nowadays there are varies insulin strength in pen devices at global market. Toujeo solostar containing Glargine 300 U/mL, 3 times concentration of current being-prescribed Glargine 100 U/mL, is available in Hong Kong market.

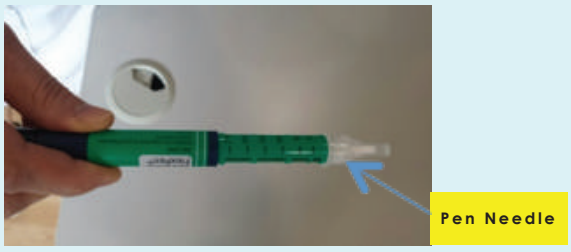


Due to sharing the same practice as in Britain, we are alert creating the risk of overdose if withdrawing insulin pen device with insulin syringe in Hong Kong,

In response to the patient safety alert, as a diabetes healthcare professional association, we suggest taking actions to protect the patient safety and also to prevent staff needle stick injury when screwing off the used pen needle from the pen.

For patient safety concerns:

- Must use **pen needle** for insulin pen device to prevent the risk of fatal overdose and ensure patient safety

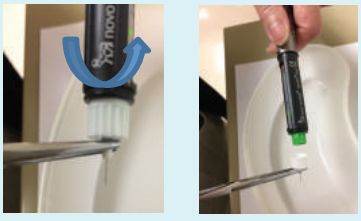


Good pratice with pen needle

For health professional safety concerns:

- Should administrate insulin with pen device by patient if possible
- If injected by healthcare providers, must use the safety device to prevent needle stick injury

Artery forceps



Safety pen needle: automatic retract the needle



Before use After use

- Provide adequate pens, pen needles and training to healthcare professionals

Activities: Jun to Dec 2016

Educational Seminar & Training

8th AHKDN Annual Symposium & Annual General Meeting was held on 25 June 2016
Diabetes Chit Chat : **"The Young and The Elderly 老幼談胰"**



Keynote Speech (1)
Topic: A Journey with Children and Adolescents Having Diabetes Mellitus
Speaker: **Dr Wong Lap Ming**
Consultant Paediatrician, Department of Paediatrics and Adolescent Medicine, New Territories West Cluster



Keynote Speech (2)
Topic: New Perspective in Managing Elderly People with Diabetes
Speaker: **Dr Au- Yeung Tung Wai**
Service Director (P & CHC), New Territories West Cluster Consultant, Department of Medicine & Geriatrics, Pok Oi Hospital

67 members & 23 non-members attended the informative lectures.

8th AHKDN AGM & Election of New Council



Business report and financial report were given by President Dr Jo Jo Kwan and Treasurer Mr. Leung Sum Ming in sequence. 54 ordinary members in site adopted the report. New council (2016-18) with 15 council members were elected.

DM Exercise Song - Dance Ambassador Training Workshop



AHKDN & Hong Kong Physiotherapy Association held training workshop on 3 Sep 2016 in Princess Margaret Hospital. Total 29 Diabetes nurses and 34 Physiotherapists attended with positive feedback.

Evidence-base Practice (EBP)







EBP project of Diabetes Nursing (2016 -2018) was started on Dec 2016. First session, we invited Dr Choi Cheung Hei and Professor Winnie So to deliver lecture on 3 Dec 2016 at OLMH.

Promoting Health Awareness in Community Education



Diabetes Conversation Map Orientation Program was held on 24 Sep 2016 with total 38 participants



Diabetes Conversation Map Facilitator Training Workshop was held on 14 Nov 2016 with total 15 participants



AHKDN co-hoisted DM Lay Program 2016 at East Meet West Symposium on 1 Oct 2016





Video Shooting for promote Chair Dance and Post up at 信報的健康專欄 on 30 Dec 2016



Medical Alert Wrist Band
Two colour wrist bands were designed for Diabetic Disease alert

International Congress

IDF Western Pacific Region Congress 2016 on 31 Oct to 4 Nov 2016 at Taiwan
11 members were nominated to join the meeting

International Diabetes Federation Western Pacific Region Congress

LAM Shuk Man APN, TKOH
MSc (EDM), BSc (Hons.) in Nursing, PDDME, RN



The 11th International Diabetes Federation Western Pacific Region (IDF-WPR) Congress and 8th Scientific Meeting of the Asian Association for the Study of Diabetes (AASD) were held from 27th October 2016 to 30th October 2016 in Taiwan, which is one of the members in West Pacific Region (WPR) of the International Diabetes Federation (IDF).

According to statistics from the IDF, there are around 153 million people in WPR having diabetes (i.e. over one-third of people with diabetes in the world) where half of them are diagnosed at higher risk of developing harmful and costly complications. Besides, it becomes noteworthy that the mortality rate caused by diabetes in WPR is the highest one (around 1.9 million deaths in 2015) among the IDF regions. Hence, diabetes is still a major health challenge not only in WPR, but also in the world. The IDF therefore continues its mission to promote diabetes care, prevention and a cure worldwide.

Theme of the Congress

The theme of IDF-WPR Congress in Taiwan this year was about "Create a new dimension in diabetes", relating the aspects of prevention, protection and care. It included plenary lectures to highlight major issues in diabetes such as discussing about national prevention programs to curb increasing prevalence of diabetes worldwide, and lessons learned from clinical trial to real world practice in diabetes management. Apart from this, there were over 30 symposia to cover major fields for diabetes care such as early screening and prevention of diabetes, diabetes medical therapy, modern technology, complication management, diabetes performance measures, diabetes psychosocial status, diabetes education, obesity / diabetes & bariatric surgery,

Learning and Networking

There were around 160 speakers to deliver their studies in various aspects related to diabetes and share their studies in various aspects related to diabetes and share their valuable experience with every participants. It was a great pleasure for me to have this opportunities to sit in different lectures as well as symposiums to learn and enrich my knowledge from the latest studies in relation to diabetes.

It was a memorable study trip because of having total number of 14 diabetes nurses from different hospitals in Hong Kong to learn and share together during the congress. It also provided me with a precious moment to discuss diabetes related issues in our workplaces and exchange experiences with each other.



During the four-day congress, although it was fully packed with different events every day, it was still a great time for us when we were exploring different topics and information around the congress venue. The organizer provided clear information about location maps, floor plans, program schedules, directories and etc. It was convenience for us to plan our daily schedule and grasp our most interested topics. I grab this chance to share some information as follows.

Medications

Prevention of Hypoglycemia is important for most of patients with diabetes worldwide. New medications namely Toujeo and Degludec are a long-acting basal insulin analog extending more than 24 hours. They would reduce the risks of hypoglycemia in patients with diabetes and improve glycemic control. Another one called Trulicity is a weekly GLP-1 receptor agonist. It would improve drug adherence and glycemic control of patients with Type 2 diabetes.

Hence, these new medications would prevent hypoglycemic and improve drug adherence for patients with diabetes so as to help them maintaining a better glycemic control.

Exercise

It is well known that regular exercise is an effective treatment strategy to reduce abdominal obesity and body weight. One of the studies about exercise modality for childhood obesity prevention and treatment illustrates that "Resistance Exercise" is effective for reducing abdominal adiposity and improving insulin sensitivity for the overweight and obese boys aged between 12 to 18 years old. On the contrary, "Aerobic Exercise" is more effective for the overweight and obese girls in the same age group. It would be useful for us to understand the needs when teaching teenage.

Information Technology

Information technology (IT) has become a part of our daily life nowadays. How we could leverage the convenience of IT to understand individual pattern of behaviors. A new trend of using mobile application with web-based management platform not only provides mutual communications among patients, their families and health care providers, but also alerts the public about importance of diabetes prevention and facilitates them to build up healthy lifestyles.

In conclusion, it was a fruitful journey for both of my knowledge and experience. I would like to take this opportunity to express my gratitude to all the diabetes nurses of this trip for sharing their valuable experiences together.

Announcement

9th AHKDN Annual Symposium & AGM

Watch Out: Diabetic Kidney Disease

謹「腎」為上

Date: 17 June 2017 14:00-17:00

Venue: CityView Hotel

Professional Promote

Conference/Seminar	Date	Web-site
77th Scientific Sessions American Diabetes Association (ADA); San Diego, California	9 – 13 June 2017	http://www.diabetes.org
Annual Conference, American Association of Diabetes Educators (AADE); Indianapolis, Indiana	4 – 7 August 2017	http://www.diabeteseducator.org
53rd Annual Meeting of the European Association for the Study of Diabetes; FIL Feira Internacional de Lisboa and MEO Arena, Portugal	11 – 15 September 2017	http://www.easd.org
IDF (International Diabetes Federation) Congress 2017 Abu Dhabi	4 – 8 December 2017	http://www.idf.org
Courses	**Date**	**Web-site**
MSc in Endocrinology, Diabetes and Metabolism 2017 - 2019	31 May 2017 (Application Deadline)	http://www.hkido.cuhk.edu.hk