



To News Editor
For Immediate Release

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**CUHK Discovers Poor Blood Glucose Control
among Insulin-treated Diabetes Patients**

According to the estimation by World Health Organization, there are 700,000 diabetes patients in Hong Kong and about 20% of them are insulin users. A recent study by the Department of Medicine and Therapeutics at The Chinese University of Hong Kong (CUHK) has found that despite the use of insulin, most patients do not achieve optimal glycemic control. Their blood glucose levels show great fluctuation and for most of the time do not reach the recommended target, putting themselves at risk of diabetic complications.

14 November was chosen as the date for World Diabetes Day in order to commemorate Dr Frederick Banting who discovered insulin. Insulin is an effective treatment for patients with diabetes and early insulinization is recommended by The American Diabetes Association (ADA) and The European Association for the Study of Diabetes (EASD). However, insulinization rate still remains low in Hong Kong. Even those who are on insulin treatment often do not achieve the target of HbA1c < 7% and sometimes suffer from episodes of low blood glucose.

In order to investigate the reasons for suboptimal glucose control among insulin-treated patients with diabetes, CUHK researchers have studied 58 patients with poorly controlled diabetes despite the use of insulin treatment. All patients underwent continuous monitoring of their blood glucose levels over 72 hours. Results showed that:

1. Patients' HbA1c averaged at 8.3% (higher than the 7% target recommended by ADA and EASD);
2. Their blood glucose levels were above 8 mmol/L for almost 60% of the time;
3. Despite having poorly controlled diabetes, nearly two-third of the subjects had low readings of blood glucose of less than 4 mmol/L (hypoglycemia events are common);
4. Most patients had large fluctuation in blood glucose levels, with 22.2 mmol/L at maximum to 1.2 mmol/L at minimum.
5. On average, blood glucose levels were within normal range (between 4 and 8mmol/L) for only 34% of the time.

Moreover, when patients were divided into three groups according to the duration that blood glucose was maintained between 4 and 8mmol/L, it was found that those patients who spend the least time within the desired range also have the greatest fluctuation in blood glucose levels, and have the worst long-term control as reflected by higher HbA1c, a marker of diabetes control which predicts the risk of future complications.

Chief investigator of the study, Professor Ronald Ma, Associate Professor of the Department of Medicine and Therapeutics at CUHK said, “The results so far have already reflected the poor control of diabetes among patients. Besides elevated blood glucose levels, the great glucose variation and the frequent episodes of hypoglycaemia also indicate that most patients are not receiving the optimal insulin treatment.”

Professor Peter Tong, Department of Medicine and Therapeutics at CUHK as well as specialist in diabetes and endocrinology, explained that an ideal blood glucose control means to maintain a steady level between 4 and 8 mmol/L at all time. Patients usually will not be alerted when their blood glucose level is slightly above the normal range. However, a prolonged elevated blood glucose level will eventually lead to devastating diabetic complications. That is why lowering blood glucose to the desired level is very important. On the other hand, when blood glucose level drops too low, patients will suffer from episodes of hypoglycaemia such as feelings of fatigue, hunger, palpitation, sweating, irritability, blurred vision and may even fall into coma. Professor Tong said, “Patients with experiences of these symptoms are usually frightened. Hence, they tend to keep the blood sugar at high levels, and with time, these patients will develop devastating vascular complications of diabetes.”

Mr. Kwan, a 70-year-old type 2 diabetes patient treated with insulin, showed poor diabetes control previously on twice daily injections of insulin. He had episodes of hypoglycaemia as well as frequent elevated readings, with elevated HbA1c of 9.1%. He was recruited into the research study. Monitoring of his blood glucose over 72 hours revealed that he had marked fluctuation in blood glucose, and in particular, his blood glucose was elevated (more than 8mmol/L) for 82% of the monitored period. After reviewing his glucose profile, he was changed to a regime of 3 daily injections of short acting insulin before meals, and a once-daily basal insulin analogue given at bedtime. After 3 months, a repeat 72 hours monitoring revealed a marked reduction in his blood glucose variation, with improvement of overall glucose control and remarkable reduction in HbA1c to 6.8%.

Professor Ma said such a case with marked fluctuation in blood glucose is actually very common. Patients can hardly notice the fluctuation if they never have an episode of low blood glucose. By monitoring Mr. Kwan’s blood glucose level with the CGMS, his large glucose variation could be detected. The information enabled doctors to change his insulin treatment regime with a long acting and peakless insulin analogue and hence improved his blood glucose control and stability.

Professor Tong quoted the treatment consensus by the ADA and EASD issued last year, “Among different preparations of basal insulin, extra long acting insulin analogue can provide steady blood glucose control.”

In conclusion, the Department of Medicine and Therapeutics at CUHK stresses the importance of maintaining blood glucose stability. Patients with the least fluctuation and blood glucose within the normal range for the largest portion of time have the best control of their diabetes. Patients and doctors often only have a snapshot of the patient’s actual blood glucose profile during the consultation. More frequent home blood glucose monitoring by patients themselves may detect the peaks and troughs that are often neglected. Better information on the blood glucose profile of patients during the day may help doctors select the most appropriate insulin treatment regime for patients. The best regime should aim at good diabetes control with reduction in the risk of hypoglycemia.



致新聞編輯
請即發放

中大發現胰島素使用者血糖控制未如理想

據世界衛生組織估計，現時本港約有 70 萬人（即十份之一人口）患有糖尿病，其中使用胰島素的患者約佔 20%。香港中文大學（中大）最新一項研究顯示，大部份胰島素使用者的血糖水平不但未能達標，而且起伏偏差大，未能穩定地控制在理想水平之內，反映出出現糖尿病併發症的風險相當高。

每年的 11 月 14 日為「世界糖尿病日」，目的為紀念胰島素發現者班廷（Dr Frederick Banting）的壽辰。胰島素注射劑的發明及應用至今已超過 80 多年，藥效已備受肯定，美國糖尿病協會（ADA）及歐洲糖尿病研究學會（EASD）亦於去年發出指引，建議病人及早使用基礎胰島素，但不少病人依然抗拒使用；即使願意接受胰島素治療的病人，血糖控制仍未如理想，更出現高低起伏的現象，甚至有低血糖症的副作用。

為進一步監察使用胰島素病人的血糖水平、起伏偏差幅度及平均有多少時間處於理想水平等，中大醫學院內科及藥物治療學系於 2007 年進行了一項研究，招募 58 名正在使用胰島素但血糖控制未如理想的糖尿病病人（包括一型及二型），連續 72 小時在腰間掛著特製的血糖監察機（CGMS），記錄該時段的血糖水平，供研究人員分析。結果顯示：

1. 病人的糖化血紅素（HbA1c，即過去三個月的血糖平均值）平均達 8.3%，超出美國及歐洲的糖尿病學會所建議的 7% 的標準；
2. 有接近六成時間，病人的血糖水平高於 8 mmol/L（即超越理想水平）；
3. 除了超標，亦有近三份之二的病人曾出現血糖低於 4 mmol/L 的讀數（病人一般會出現低血糖徵狀）；
4. 病人的血糖水平高低起伏差異大，最高達 22.2mmol/L，最低則只有 1.2mmol/L；
5. 平均來說，病人的血糖水平只有三成多時間處於 4 - 8 mmol/L 之間（即較為可接受的水平）。

數據又顯示，血糖處於理想水平愈短時間的病人，他們的血糖水平起伏差異亦較大，糖化血紅素也較高（糖化血紅素愈高代表病人的長期血糖管治較差，出現糖尿病併發症的機會也愈大）。

負責該項研究的中大內科及藥物治療學系副教授馬青雲教授說：「研究反映出病人的血糖控制差強人意。他們雖已接受胰島素治療，但血糖控制依然超標，而且血糖過低的情況十分普遍，血糖水平高低起伏又大，完全不能達到理想的胰島素治療效果。」

中大內科及藥物治療學系教授兼糖尿及內分泌專科醫生唐俊業教授指出，理想的

血糖控制是把血糖穩定地控制在 4 - 8 mmol/L 的水平。如果血糖稍為偏高，病人通常不會感到任何不適，但長期高企則會誘發各種糖尿病併發症，因此治療糖尿病的首要著眼點是降低血糖水平。但另一方面，如果血糖降得太低，病人就會感到疲倦不適、冒冷汗、心跳加速、嚴重饑餓、脾氣暴躁、頭暈眼花等明顯徵狀，嚴重者甚至會昏迷。唐教授說：「曾經歷過低血糖症的病人都會非常害怕，寧願讓血糖水平高一點。但血糖長期偏高，只會增高血管出現併發症的風險。」

現年七十歲的關先生是其中一名接受監察的二型糖尿病病人，以往每日注射中效胰島素兩次，但效果並不理想，糖化血紅素依然高達 9.1%。CGMS 監察器更顯示，關先生的血糖水平有八成多的時間超標，而且波幅甚大，由最高的 22.2 mmol/L 至最低的 4.1 mmol/L，相差多達 18.1 度。其後醫生為他轉用每日一次的長效基礎胰島素（臨睡前注射），再加三次餐前短效胰島素的治療方案。三個月後，關先生的糖化血紅素隨即下降至 6.8% 的理想標準，平均血糖水平亦達標，更有超過一半時間能把血糖控制在正常水平，而且波幅明顯收窄，較之前平穩。

馬青雲教授指出，像關先生這樣的情況其實很普遍。由於較少病人會時刻「拮」手指驗血糖，如果沒有出現低血糖症，病人未必會察覺自己的血糖水平原來有這麼大的波幅。CGMS 讓病人發現有關問題，再配以藥效無高峰值的長效基礎胰島素，病人情況因而得到改善。

唐俊業教授引用歐美的糖尿病學會去年所發出的治療共識解釋：「在不同的基礎胰島素中，長效的基礎胰島素注射劑，能在 24 小時內逐漸釋放藥效，因此更能平穩地控制血糖。」

研究總結，穩定的血糖控制，可減少低血糖症出現的機會和避免高血糖所引致的併發症。中大內科及藥物治療學系呼籲，糖尿病人應勤加「拮」手指驗血糖，若只在覆診時才讓醫生檢驗，則只能反映那一刻的血糖水平，不能反映其穩定性。病人若經常自我監察，有助醫生採用最適當和有效的胰島素治療，從而把血糖平穩地控制在理想的水平內。

二零零八年十一月十二日