Conclusion: This case illustrates the management dilemma between an unusual combination of diseases. The balance of potassium levels between insulin use in T1DM and FHPP creates significant challenges. Fortunately, the use of subcutaneous insulin in this patient did not appear to trigger episodic weakness. Further studies of hypokalemic periodic paralysis are critical to the institution of appropriate therapy and prevention of symptoms in patients with these conditions. Careful replacement and monitoring of potassium is recommended as patients require high doses of potassium during acute episodes of flaccid paralysis, and requirement significantly decreases after an acute episode.

Diabetes Mellitus and Glucose Metabolism

TYPE 1 DIABETES

Virtual Pump Trainings for the t:slim X2 Insulin Pump With Control-IQ Advanced Hybrid Closed-Loop Technology: Real World Patient Experience

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The COVID-19 pandemic led to a digital evolution in the healthcare industry by necessitating widespread adoption of telehealth and other remote services to enable engagement with patients. Diabetes management is well suited for telehealth utilization if patients employ technology that efficiently generates, captures, and shares data with providers. Traditionally, training for automated insulin delivery devices is provided in-person to allow for a thorough understanding of the device and its use. However, during COVID-related quarantine regulations, most of these trainings needed to be conducted virtually. We performed a retrospective analysis of patient reported outcomes in people with diabetes who completed their training for the t:slim X2 pump with Control-IQ technology between April and September, 2020 and had uploaded 30 days of pump usage data to Tandem's t:connect® web application. Most participants were adults (90%), female (54%), and had type 1 diabetes (89.9%). Mean age of the sample was 46 years (SD=18.7). Of all 1,686 participants, 1,256 had received virtual pump training while the remaining were trained in-person (n=430). Most participants reported completing their training in 1 to 2 hours (61.5%). After concluding training, participants completed an online questionnaire evaluating their training experience (8 items). Item response options included a 5-point Likert scale with higher values reflecting greater satisfaction and better experience with training. Multivariate analysis of variance indicated a significant effect of training method (virtual vs. in-person) on training-related experience (p=.020). Specifically, participants receiving virtual pump training reported greater overall satisfaction with their training (4.78 vs. 4.65, p=.012) and with the time when their training was conducted (convenient scheduling) (4.74 vs. 4.56, p=.008) compared to their counterparts who underwent in-person training. There were no significant differences between virtually trained and in-person participants on pace of training (4.71 vs. 4.57), trainer's pump knowledge (4.82 vs. 4.74), trainer's ability to answer their questions (4.77 vs. 4.70), and participants' confidence to use the pump after training (4.62 vs. 4.53). In conclusion, all participants irrespective of their training method (virtual or in-person) reported a positive experience with their training for using the t:slim X2 pump with Control-IQ technology. Participants' high scores on items evaluating their training method also reflects that their expectations of their training session were either met or exceeded. State-of-the-art technologies supporting diabetes management may benefit from patient-centric training methods to enable widespread optimal use. For future studies, it will be interesting to evaluate adherence to therapy by training method and relationship with glycemic outcomes.

Diabetes Mellitus and Glucose Metabolism

TYPE 2 DIABETES

A Pilot Study of External Counterpulsation on Reactive Hyperemia, Levels of Glycemia and Metabolic Parameters in Type 2 Diabetes Mellitus

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Introduction: External counter-pulsation (ECP) involves cuff inflation over the lower extremities to generate sheer stress, thereby improving endothelial function and anginal symptoms in coronary artery disease. Endothelial dysfunction is also involved in the pathogenesis of T2DM. We hypothesized that 1) ECP will be associated with an improvement in endothelial function in T2DM as measured by peripheral artery tonometry, and 2) explored whether this would vary with different dose and frequency regimens. A shorter or less intensive regimen could potentially reduce cost and improve patient compliance if a similar therapeutic response is achieved.
Methods: This single-center prospective study in a tertiary institute in Singapore involving 46 adults with T2DM of HbA1c between 7 to 10%, who were randomly assigned to receive 35 sessions of ECP at different regimens and duration. Subjects in arm 1 received 1-hour daily sessions 5x per week for 7 consecutive weeks, subjects in arm 2 received 0.5-hour sessions 5x per week for 7 consecutive weeks, and subjects in arm 3 received 1-hour sessions 3x per week for 12 consecutive weeks. Endothelial function was evaluated by reactive hyperemia index (RHI) via peripheral arterial tonometry measured at the start, midpoint and end of study. Other secondary outcomes included fasting glucose, homeostatic model assessment of insulin resistance (HOMA-IR), HbA1c, blood pressure, lipid profile, weight and vibration sense.
Results: 42 subjects completed the 35-session course of ECP. Mean age was 56.1±9.3 years, duration of diabetes 8.8±4.7 years, baseline RHI 2.0 (1.3–3.7) and baseline HOMA-IR was 3.1 (0.5–18.7). All regimes of ECP were well-tolerated. There was no change in RHI across all 3 regimens of ECP individually or collectively at the end of the study (ΔRHI +0.01%, p=0.458). Glycaemic markers of fasting glucose, HbA1c and HOMA-IR, as well as blood pressure, lipid profile, weight and vibration sense also

remained unchanged at endpoint. Subgroup analysis showed a significant improvement in RHI (ΔRHI +20.6%, p=0.0178) in 7 subjects with more severe endothelial dysfunction (defined by RHI<1.67) at baseline who had a trend to having a longer duration of diabetes, however there was no improvement in fasting glucose, HbA1c, HOMA-IR or metabolic parameters in this group.
Conclusion: ECP did not show a beneficial effect on endothelial function, glycemic control or metabolic parameters in this South-East Asian population with T2DM at any of the three regimens. This may partly be explained by less severe endothelial dysfunction and less insulin resistance in our population at baseline. Future studies of ECP may investigate its potential benefits in a larger population of T2DM with more severe endothelial dysfunction, higher insulin resistance and/or longer duration of diabetes at baseline.

Diabetes Mellitus and Glucose Metabolism

TYPE 2 DIABETES

A Point-of-Care Interactive Decision Tool Reveals Variance Between Clinicians and Experts in Selecting Among GLP-1 RAs in T2D

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Background: T2D management is shifting toward treating patients with therapies that align with their level of CV and end-organ risk. To this end, evidence-based guidelines now recommend glucagon-like peptide-1 receptor agonists (GLP-1 RAs) for both glycemic and extraglycemic benefits. The great speed with which these recommendations change create immediate gaps in knowledge and competence, especially as they relate to managing patients with comorbid CV and/or renal disease. To help clinicians understand GLP-1 RA therapies and their novel characteristics in practice, we developed a decision support tool where choice of treatment among GLP-1 RAs is guided by a panel of experts.
Methods: We developed a decision support tool with guidance from 5 experts who provided therapy recommendations for 48 unique patient case scenarios based on patient variables including CVD, CKD, retinopathy, A1C level, and need for weight loss. Clinician learners are prompted to specify a patient scenario using these variables before selecting an intended therapy. After all questions are completed for a patient scenario, the tool displays what the panel of experts recommend and then asks the learner if this information changed their intended choice.
Results: From February through October 2020, 983 learners entered 1433 unique patient case scenarios. Of these, 365 were anonymous and 623 were authenticated, of which 70% (n = 437) were from the US; 50% (n = 310) were MDs; 22% (n = 135) were nurses, NPs, or PAs; and 19% (n = 121) were PharmDs.
The intended therapy of learners differed from the experts in 34% (n = 489) of cases and were limited to 3 categories: cases in which learners chose to use exenatide (17%), cases in which they chose to use a GLP-1 RA in conjunction with insulin (12%), or cases in which they were unsure (71%).
Of note, of the 93 cases in which learners chose exenatide, 68% (n = 63) were cases with CVD and/or CKD, where exenatide was not recommended by experts. Similarly, of the 89 cases in which learners chose insulin with a GLP-1 RA, 57% (n = 51) were cases with A1C < 9%, where insulin was not recommended by experts.
Of cases in which learners' intended therapy differed from the experts' (and they indicated the impact of the tool), 52% indicated that they planned to change their treatment plan.
Conclusion: This tool highlights continuing gaps in clinicians' ability to select among GLP-1 RAs for T2D. Using a decision support tool can positively influence practice behaviors: Learners can see if their intended treatment choice is congruent with a panel of experts and change plans as appropriate.

Diabetes Mellitus and Glucose Metabolism

TYPE 2 DIABETES

Accuracy of a Point-of Care Hemoglobin A1c Assay - A Community Outreach Project.

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Glycated hemoglobin (HbA1c) is an invaluable tool in diabetes mellitus (DM) management. Conventionally obtained via venous blood sampling, point-of-care (POCT) capillary HbA1c measurement offers an opportunity for immediate treatment modification, reduced cost & increased patient satisfaction. While previous studies using the POCT HbA1c test A1cNow+ have shown accuracy within a 0.5% range from the gold standard venous HbA1c, we noted discrepancy in our community health clinic & sought to evaluate the accuracy of POCT HbA1c levels compared to venous HbA1c levels to guide our clinical decision-making.
In this 2-part study, we compared POCT HbA1c levels measured via a single use A1CNow+ HbA1c monitoring device & venous HbA1c samples measured by a standardized lab. Part1: after retrospective chart review, we identified 262 patients with prediabetes, Type1 or Type2 DM based on ADA guidelines who attended our clinic from January 2019-June 2019 & received POCT HbA1c with A1cNow+ testing during their visit. Of those cases, 47 patients also had a venous HbA1c at a standardized laboratory within 1 month of having their POCT HbA1c performed in our clinic. Part2: We noted variability in the temperature storage of A1CNow+ test strips. Storage was standardized to room temperature as per device instructions in June 2019. We subsequently reviewed charts from June 2019-December 2019 & identified 118 patients who had both POCT HbA1c & venous HbA1c measurement within a 1 month period.
Patients was categorized into subgroups per ACP guidelines for DM control: prediabetic (HbA1c 5.7–6.4%), controlled DM (HbA1c 6.5 to 8.0%) & uncontrolled DM (HbA1c >8.0%). The average difference between POCT & venous HbA1c tests was calculated & analyzed for