Type 2 diabetes and end stage renal disease – A case study

In the United States alone, there are 20 million people affected with type 2 diabetes and 19 million people diagnosed with chronic kidney disease. Diabetes alone accounts for 45% of all patients diagnosed with kidney failure. The normal age-related decline in renal function is moderately accelerated with the occurrence of type 2 diabetes, obesity and cardiovascular disease. Mr. D's risk of developing end stage renal disease was higher compared to other type 2 diabetics due to additional factors such as hyperlipidemia, poor management of type 2 diabetes, high blood sugar, missing insulin doses, heavy alcohol consumption, and non-compliance with dietary restriction (Cavanaugh, 2007).

Upon diagnosis of Mr. D's type 2 diabetes, he was strongly recommended to lose weight, as his diabetes was considered to be a result of his obesity. However, due to his medical non-compliance and missing insulin shots, his body began to use stored fats instead of carbohydrates for energy, and this resulted in a drastic weight loss over the course of 15 years (Brides et al., 2012). Even after initiating dialysis, he lost 15% of his dry weight in one year. Dry weight is the weight of the body without the excess fluid. This can again be attributed to his non-compliance with medications, dietary restrictions and dialysis schedules (Lindberg et al., 2013).

A high-protein diet is paramount for patients on dialysis as it increases protein catabolism to a large extent. Most of the proteins that are consumed are broken down into waste products called urea and a patient on dialysis clears out urea from the body quite efficiently. This also leads to a deficiency of nitrogen in the skeletal muscles, leading to fatigue and weakness. The protein lost per day for a patient on dialysis is 6 to 8 g/day. Hence, Mr. D needs to consume 1.2 g/kg/day to account for the protein loss due to dialysis. Protein intake needs to be balanced with calorie intake to avoid a situation where the body uses protein as an energy source. Mr. D

requires 35 kcal/kg/day and he needs to ensure that concentrated sugars are avoided due to his diabetes (Gunes, 2013).

Mr. D may benefit from a referral to the Medicare End Stage Renal Disease (ESRD) program, which aims to improve the quality of healthcare services available to patients and ensure their compliance, improve data collection and storage, establish partnerships, resolve patient complaints and issues with their condition and treatment regime, and indulge the patients in vocational rehabilitation programs (Forum of ESRD Networks, 2005). The Kidney Resource Services disease management program organized by Optum can also help Mr. D by educating and empowering him and his caretaker with regards to diet and fluid restrictions, medication and dialysis, working on self-management behaviors, focusing on glycemic control, weight control and regular eye examinations, dialysis access management, evaluating of the possibility of kidney transplant, and minimizing hospital admissions (Optum, 2014).

There are a number of ways to check if Mr. D is following his dietary, medication and dialysis regime. One study has used a Morisky questionnaire to assess compliance with medication. Other methods might include analysis of prescription refill records and chemical markers of medications in the body. Compliance with dialysis schedule may be assessed by analysis of phosphorus levels in the plasma and levels of parathyroid hormone (Burnier et al., 2014). Adherence to fluid and diet restrictions may be assessed by regular checking of interdialytic weight loss or gain and analysis of levels of potassium, phosphorus, and blood urea nitrogen (BUN). A Dialysis Diet and Fluid Nonadherence Questionnaire (DDFQ) may also be used to assess the severity of non-adherence to diet and fluid restrictions (Khalil et al., 2011).

References

Brides, V., Rapadas, J. A. M., Sabella, W. R., Sanchez, A., ThelShorette, J. M., & Tan II, L. (2012). Compliance of treatment management among diabetes patients. *Advanced Nursing Research, 4*, 143-167. http://dx.doi.org/10.7828/anrj.v4i1.204

Burnier, M., Pruijm, M., Wuerzner, G., & Santschi, V. (2014). Drug adherence in chronic kidney diseases and dialysis. *Nephrology Dialysis Transplantation, 0*, 1-6. http://dx.doi.org/10.1093/ndt/gfu015

Cavanaugh, K. L. (2007). Diabetes management issues for patients with chronic kidney disease. *Clinical Diabetes, 25*(3), 90-97. http://dx.doi.org/10.2337/diaclin.25.3.90

Forum of ESRD Networks. (2005). *End Stage Renal Disease Networks* [Program Overview]. Retrieved from http://esrdnetworks.org/esrd-networks-1/Program%20Overview%203-9%20FINAL.pdf

Günes, F. E. (2013). Medical Nutrition Therapy for Hemodialysis Patients, Hemodialysis, Prof. Hiromichi Suzuki (Ed.). *InTech*. Retrieved from http://www.intechopen.com/books/hemodialysis/medical-nutrition-therapy-for-hemodialysis-patients

Khalil, A. A., Frazier, S. K., Lennie, T. A., & Sawaya, B. P. (2011). Depressive symptoms and dietary adherence in patients with end-stage renal disease. *Journal of Renal Care, 37*(1), 30-39. http://dx.doi.org/10.1111/j.1755-6686.2011.00202.x

Lindberg, M., Bäckström-Andersson, H., Lindström, R., & Lindberg, M. (2013). Dry weight from the haemodialysis patient perspective. *Renal Society of Australasia Journal, 9*(2), 68-73. Retrieved from http://www.renalsociety.org/public/6/files/documents/RSAJ/2013.07/lindberg.pdf

Optum. (2014). *Managing End-Stage Renal Disease* [White Paper]. Retrieved from https://www.optum.com/content/dam/optum/resources/whitePapers/managing-end-stage-renal-disease-wp.pdf