The Management of Hyperglycaemia and Dyslipidaemia in an In-Patient Setting

Chantell Hayward-Zeelie, BPharm, PharmD Candidate
Kimberley Hospital Complex/Rhodes University

This paper is based on the Best Scenario presentation at the SAAHIP Conference 2016

Patient case
A 48-year-old, female patient (known smoker) with no previous medical history presented with diabetic ketoacidosis (DKA), secondary to a urinary tract infection and undiagnosed diabetes mellitus type II (DMT2). She had blood glucose levels of 19.8mmol/L as well as severe dyslipidaemia (triglyceride (TG) levels of 41.3mmol/L and a total cholesterol of 13.4mmol/L).

Background
DMT2 occurs secondary to a gradual decrease in pancreatic beta-cell function. The use of insulin compared to oral anti-hyperglycaemic agents (OHAs) helps to reserve beta-cell function longer. Most clinicians tend to initiate newly diagnosed DMT2 patients on lifestyle modifications and/or OHAs which is in line with current guidelines. This may however not be the optimal regimen for all patients.

1,2

Hypertriglyceridaemia occurs more commonly in diabetic patients than in non-diabetic patients. Diabetic patients have an overproduction of very low density lipoproteins (VLDL), impaired triglyceride lipolysis and less effective lipoprotein lipase, which is essential for the breakdown of TGs.

OHAs versus Insulin
In a patient presenting in DKA, OHA monotherapy is not advised as these patients have insulin resistance and insulin deficiency. Insulin preserves beta-cell function and increases insulin sensitivity and secretion, whereas most OHAs only increase insulin secretion. Furthermore, insulin results in a 50% decrease in TGs whereas OHAs are only able to decrease TGs by 15%.4 6

This patient presented with an HbA1c of 14.1%. Insulin can decrease HbA1c by ≥2.5% whereas OHAs can only decrease it by 1-2%. According to Society for Endocrinology, Metabolism and Diabetes of South Africa (SEMDSA) Guidelines, if a patient presents with a HbA1c >10%, insulin therapy is advised to ensure that the target HbA1c (<7.5%) is reached.

Basal Bolus versus Pre-Mixed/Biphasic Regimen
In the PREFER and GINGER trials, as well as a meta-analysis by Grugliamo et al., it was shown that there is a greater chance of achieving both the target HbA1c and a greater decrease in HbA1c when using a basal bolus regimen rather than a biphasic insulin regimen.

Intensive versus Standard Therapy
Patients with an HbA1c >7.5% have been found to have a 2.5 to 5 times increased risk of microvascular complications. According to the ACCORD trial, intensive therapy (maintaining the patient’s blood glucose levels <7.5mmol/L) resulted in a significant decrease in ischemic heart disease, myocardial infarction (MI), coronary revascularisation and unstable angina as compared to patients who were on standard therapy. In this case it was thus decided to use intensive therapy rather than standard therapy.

Management of dyslipidaemia
Statins are usually the drugs of choice for lowering low-density lipoprotein (LDL). They are highly effective for both LDL and VLDL reduction. They decrease TG and increase high-density lipoprotein cholesterol (HDL-C). This patient had significantly increased TGs and therefore combination therapy aimed at decreasing TG levels was required.

When comparing a statin/fibrate combination to a statin/niacin combination, the latter combination was found to result in a greater decrease in LDL-C and decrease in HDL-C. However, niacin has been associated with an increased incidence of hyperglycaemia. It was thus decided to rather use the combination of bezafibrate and simvastatin.

Determining the Dose of Simvastatin
By utilising the Framingham score it was found that the patient had a 10-year risk of MI of >30%. According to the American Heart Association, patients with a LDL-C >1.8mmol/L and a cardiovascular risk >7.5% are advised to receive high-dose statin therapy. This patient was subsequently initiated on simvastatin 40mg daily.

Recommendations and Conclusions
Guidelines need to be tailored to fit specific patient groups. When selecting a regimen for a patient, long-term outcomes as well as all the patient’s co-morbidities need to be considered.
References


Erratum note

The article titled “Atopic dermatitis: tacrolimus vs. topical corticosteroid use” authored by Y Langa and E van der Merwe, was republished in SAPJ 2016 Vol 83(3). This article had changes made to it as an update of information that was not approved by the authors of the article. The publisher therefore wish to emphasise that the version of record of this article is the original one published in SAPJ 2010 Vol 77(10). The publisher has replaced the electronic version of the republication with the original PDF. We apologise for any inconvenience caused.