



Perioperative Management of the Diabetic Patient

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Abstract

As the rate of Diabetes continues to rise within the U.S. the number of patients undergoing surgery with diabetes increases in a linear fashion. Furthermore, due to hormonal imbalances caused by this disorder, the diabetic patient population requires unique care throughout the entire perioperative journey. Patient's undergoing surgery with Diabetes Mellitus require continuous monitoring to prevent metabolic disturbances that may occur in the perioperative area. Given their dynamic vulnerability, providers should be well aware of the possible complications associated with this patient population and the appropriate modes of treatment for these complications. Emphasis has been placed upon providing quality care perioperatively for diabetic patients and the prevention, diagnosis, and treatment of potential complications.

Introduction

Diabetes Mellitus is an ongoing issue within the United States affecting about 10.5% of the population, roughly 34.2 million people, and is associated with many health complications (Kharroubi et al. 2015). It is fairly common for diabetic patients to present with co-existing conditions such as peripheral neuropathy, kidney damage, skin conditions, and cardiovascular disease. With the upward trend of Diabetes within the U.S. and the numerous conditions associated with the disease, it is evident an increasing amount of the patient population undergoing surgery will have this disease. Perioperative management can be divided into three phases, pre-operative, intraoperative, and post-operative management. Managing blood glucose levels in diabetic patients is one of the key components of controlling the disease. Since abnormal blood glucose levels can have severe outcomes, adequate prognosis, diagnosis, and treatment is essential for optimal recovery of the diabetic patient. If abnormal blood glucose levels are left untreated, it may lead to hyperglycemia, hypoglycemia, diabetic ketoacidosis, or hyperosmolar hyperglycemic syndrome. These complications are linked with poor surgical outcomes and require proper interventions to prevent and treat such complications.

Pre-Operative Management

Stop oral and anti-hyperglycemic & non-insulin injectables the day of surgery.
If patient is on insulin therapy: reduce dose according to the type of insulin and endocrinologist recommendation.
Pre-medicate with nonparticulate antacids and metoclopramide to minimize aspiration risk (Leung et al. 2017).

Intra-Operative Management

Focus on maintaining the patient's normal glucose levels.
Administer 5g of glucose/hour to prevent hypoglycemia, protein breakdown, and ketosis.
For fluid management of hypovolemia or blood loss, avoid dextrose-containing solutions. (Dogra et al. 2021)

Post-Operative Management

Continue glucose monitoring → manage blood glucose levels with intravenous or subcutaneous insulin.
If poor or no oral intake → manage with basal and correctional insulin
If regular oral intake → manage with 1/2 TDD basal, 1/6 TDD nutritional (3x with each meal), and correctional as needed

Complications and Treatments

Hyperglycemia:

BG >140mg/dL

Symptoms: fatigue, blurry vision, thirst, fruity breath, increased hunger, nausea and vomiting, increased urination

Manage with subcutaneous insulin or IV insulin infusions with frequent BG checks

Ketoacidosis:

Symptoms: increased urination, confusion, thirst, high BG, rapid breathing, abdominal pain, nausea & vomiting.

Manage with insulin infusions and isotonic fluids containing K+ to correct hypovolemia, hyperglycemia, and potassium deficits.

Hypoglycemia:

BG <70mg/dL

Symptoms: Dizziness, hunger, Irritability, clammy skin, and cognitive impairment

Manage with IV glucose, glucose tablets, gels, glucagon injections, or IV dextrose solutions.

Conclusion

Surgical patients with Diabetes Mellitus require unique perioperative care with an emphasis on the importance of continuous glucose monitoring perioperatively. Maintaining normal blood glucose to optimize patient safety is a theme seen throughout all of the research that has been conducted. Medical and anesthesia guidelines for diabetic treatment strategies to reduce perioperative risk and complications include continuous glucose monitoring, precise fluid management, and pre-operative medication adjustments. The primary focus on management of diabetic patients includes direct care and frequent monitoring to detect any changes in metabolic control and to correct any metabolic changes accordingly before they become severe. Without the proper intervention and keen observation, several intraoperative complications may occur such as hyperglycemia, hypoglycemia, diabetic ketoacidosis, and hyperosmolar hyperglycemic syndrome.

References

Dogra, P. and Jialal, I. (2021). *Diabetic Perioperative Management*. Statpearls
<https://www.ncbi.nlm.nih.gov/books/NBK540965/>

Duggan, E. W., Carlson, K., & Umpierrez, G. E. (2017). Perioperative Hyperglycemia Management: An Update. *Anesthesiology*, 126(3), 547–560.
<https://doi.org/10.1097/ALN.0000000000001515>

Evans K. (2019). Diabetic ketoacidosis: update on management. *Clinical medicine (London, England)*, 19(5), 396– 398.
<https://doi.org/10.7861/clinmed.2019-0284>

Kharroubi, A. T., & Darwish, H. M. (2015). Diabetes mellitus: The epidemic of the century. *World journal of diabetes*, 6(6), 850–867.
<https://doi.org/10.4239/wjd.v6.i6.850>

Leung, V., & Ragbir-Toolsie, K. (2017). Perioperative Management of Patients with Diabetes. *Health services insights*, 10, 1178632917735075.
<https://doi.org/10.1177/1178632917735075>

Sudhakaran, S., & Surani, S. R. (2015). Guidelines for Perioperative Management of the Diabetic Patient. *Surgery research and practice*, 2015, 284063.
<https://doi.org/10.1155/2015/284063>