

DOI: <https://doi.org/10.33314/jnhrc.v19i2.3683>

Stabilize First or Reperfuse Immediately: Concomitant STEMI and DKA Management

Eka Prasetya Budi Mulia¹

Dear Editor,

We read with keen interest a report of concomitant ST-elevation myocardial infarction (STEMI) and diabetic ketoacidosis (DKA) by Kadel et al.¹ The authors reported prompt and appropriate treatment with DKA stabilization followed by primary PCI immediately. However, during the course of treatment, due to poor prognosis, the outcome was not good.

Their report is in line with the outcome of the retrospective cohort study by Bandyopadhyay et al.² reported 745 STEMI patients having a concomitant diagnosis of DKA. This cohort mentioned that DKA in STEMI was associated with increased mortality, shock, cardiac arrest, kidney injury, ICU stay, and cost of care.²

Primary PCI is the preferred reperfusion approach for all STEMI patients presenting within 12 hours of symptom onset. Prompt restoration of blood flow improves patient survival. ESC STEMI guideline stated that when the primary PCI is indicated, the goal should be a delay (FMC to wire crossing) of ≤ 90 min.³ Optimization of the first 10 minutes from FMC to diagnosis establishment plays a vital role to direct management afterwards. Immediate reperfusion and short wire crossing time are essential in STEMI management. Hence, preparation of primary PCI could be done simultaneously during stabilization of DKA in early (emergency) state, which consists of blood collection for metabolic profile, insulin administration if potassium level of >3.3 mEq/L (potassium supplementation intravenously if needed), and fluid resuscitation using normal saline 1 L/hour during the first hours.⁴ In patients presenting with hypotension and shock, bedside echocardiography can help distinguish the cause of shock as both diseases may contribute to the development of shock, whereas DKA contributes to hypovolemia and STEMI to decreased cardiac performance. Aggressive and careful fluid therapy can be performed in hypovolemic patients with close monitoring of volume status while awaiting PCI preparation. As for STEMI, the presence of cardiogenic shock is a definite indication for primary PCI. DKA management protocols

(insulin, fluid, metabolic, and electrolyte management)⁴ can be continued simultaneously while the patient is undergoing PCI, which usually only lasts about 30-60 minutes. Further management of DKA can be continued without interruption when the patient is admitted to the cardiovascular care unit along with antithrombotic and statin.

In conclusion, in the acute setting of STEMI and DKA, appropriate and prompt treatment is needed to improve the prognosis. DKA stabilization during PCI preparation should be implemented. However, case by case management must be tailored because of the possibility of pseudoinfarction in DKA.

Author Affiliations

¹Department of Cardiology and Vascular Medicine, Faculty of Medicine, Universitas Airlangga - Dr. Soetomo General Hospital, Surabaya, Indonesia.

Competing interests: None declared

REFERENCES

1. Kadel A, Thakur KK, Rauniyar BK, Adhikari RB, Limbu D, Malla R. Acute Myocardial Infarction and Diabetic Ketoacidosis: The Lethal Duo. J Nepal Health Res Counc 2021;19:212-4. [\[JNHRC\]](#)
2. Bandyopadhyay D, Devanabanda AR, Tummala R, Chakraborty S, Hajra A, Amgai B, et al. Effect of diabetic ketoacidosis on the outcomes of ST-elevation myocardial infarction: An analysis of national inpatient sample. IJC Hear Vasc 2019;24:238-40. [\[Article\]](#)
3. Ibanez B, James S, Agewall S, Antunes MJ, Bucciarelli-Ducci C, Bueno H, et al. 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. Eur Heart J 2018;39:119-77. [\[Article\]](#)
4. Gosmanov AR, Gosmanova EO, Dillard-Cannon E. Management of adult diabetic ketoacidosis. Diabetes, Metab Syndr Obes Targets Ther 2014;7:255-64. [\[Article\]](#)

Correspondence: Eka Prasetya Budi Mulia, Department of Cardiology and Vascular Medicine, Faculty of Medicine, Universitas Airlangga - Dr. Soetomo General Hospital, Surabaya, Indonesia. Email: eka.prasetya.budi-2017@fk.unair.ac.id, Phone: +628562765365.