



# Stress Hyperglycemia in ACS and Pulmonary Disease

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## Introduction

Stress Hyperglycemia is defined as ‘transient hyperglycaemia during illness’ and is a common condition. Hyperglycaemia typically resolves as the illness dissipates, although in a proportion of people it may indicate unrecognised diabetes mellitus. Despite this, it still remains under-recognised and the best management of the condition is unclear and remains the subject of active research.

## Historical Background

•In 1855, Bernard was the first to report Data relating to hyperglycaemia in critically ill patients (Figure,1).



Figure 1. Claude Bernard (1813–1878)

## Stress Hyperglycemia and Mortality in ACS and Acute Pulmonary Disease:

Even after adjustment of variables, the new hyperglycemia group had an 18.3-fold increased mortality rate compared with a 2.7-fold increase in the known diabetes group (Umpierrez G et al, J Clin Endocrinol Metabol 87:978, 2002) as shown in (Figure 3). Intensive insulin therapy (80 to 110 mg/dL) in a primarily surgical ICU patient population resulted in a significant decrease in morbidity and mortality. However, implementation of the identical protocol in 1,200 medical ICU patients by the same investigators in the same institution diminished morbidity but failed to reduce mortality for example in ACS patients (*AACE guidelines of management of in hospital hyperglycemia 2009*). Hyperglycemia on admission is independently associated with adverse outcomes in patients with CAP (*McAllister et al, Diabetes Crae 28:810-815, 2005*) as shown in Figure, 4.

## Hyperglycemia and Pneumonia Outcomes

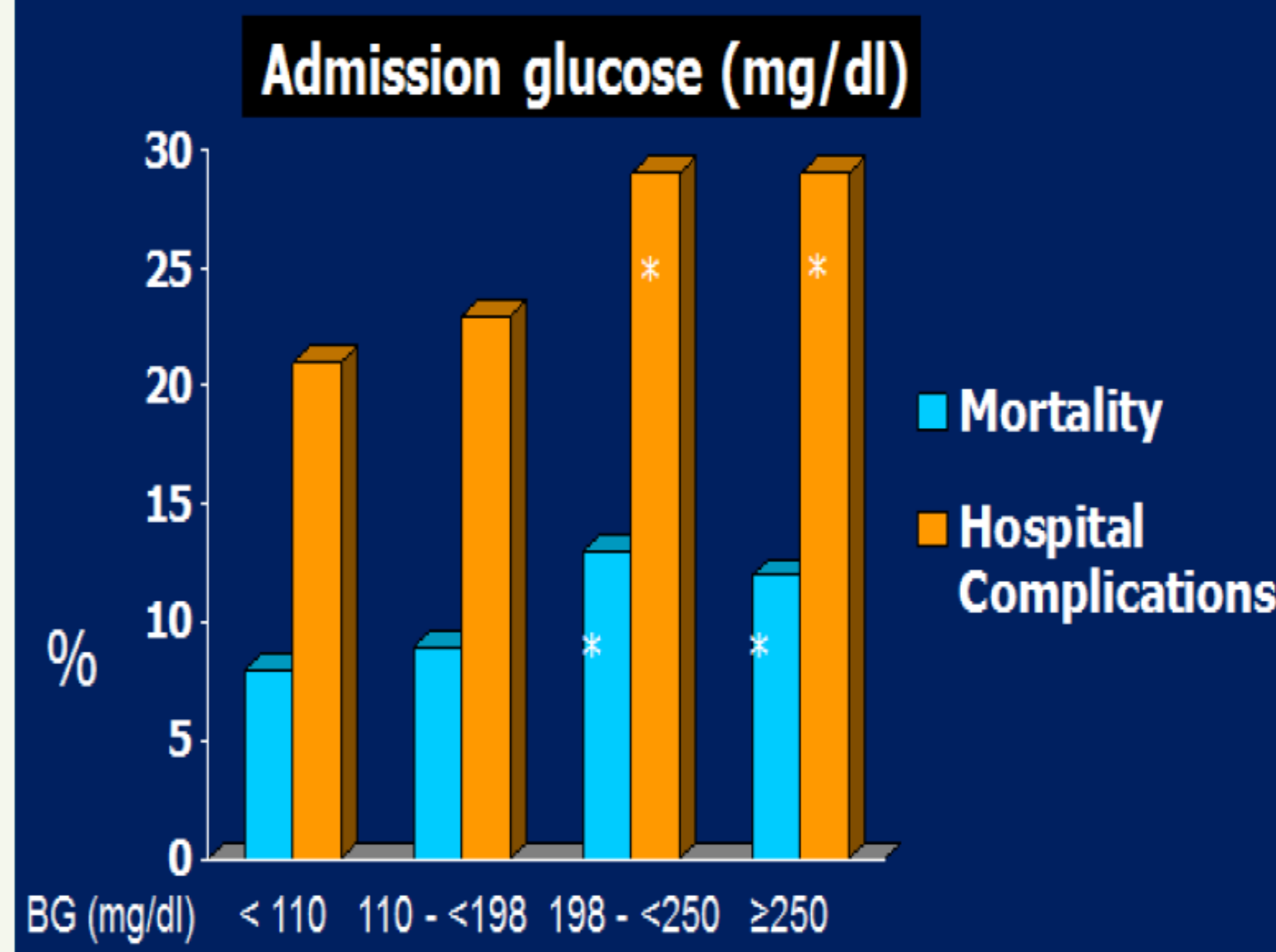


Figure 4. Association between hyperglycemia and pneumonia outcomes: N= 2,471 patients with CAP. \* p: < 0.05 vs BG < 198 mg/dl (11 mmol/L), McAllister et al, Diabetes Crae 28:810-815, 2005.

## Scope of the problem:

- Data from Norhammar et al indicate that in 181 consecutive patients hospitalized with MI and no diagnosed diabetes, 66% had undiagnosed glucose abnormalities, including undiagnosed diabetes or IGT (Figure 2).
- Our local data shows that prevalence of prediabetes in non-diabetic patients admitted to Duhok CCU was 31.4%, while diabetes was 15.7% (Ramadhan Salahaldeen, unpublished data).

## Management and recommendations:

### Hyperglycemia in Critically Ill Patients :

The glucose level should be maintained between 140 and 180 mg/dL. Initiate insulin when RBS exceeding 180 mg/dl. While tight glycaemic control (80-110 mg/dl) should be avoided as it may increase mortality. In critically ill patients use IV insulin is recommended.

### Hyperglycemia in non-critically Ill Patients:

Keep fasting glucose targets <140 mg/dL, while Random BG should be kept <180 mg/dL and to avoid hypoglycemia, reassess insulin regimen if BG levels fall below 100 mg/dL. While in non critically ill patients, use SC insulin with basal bolus protocol .

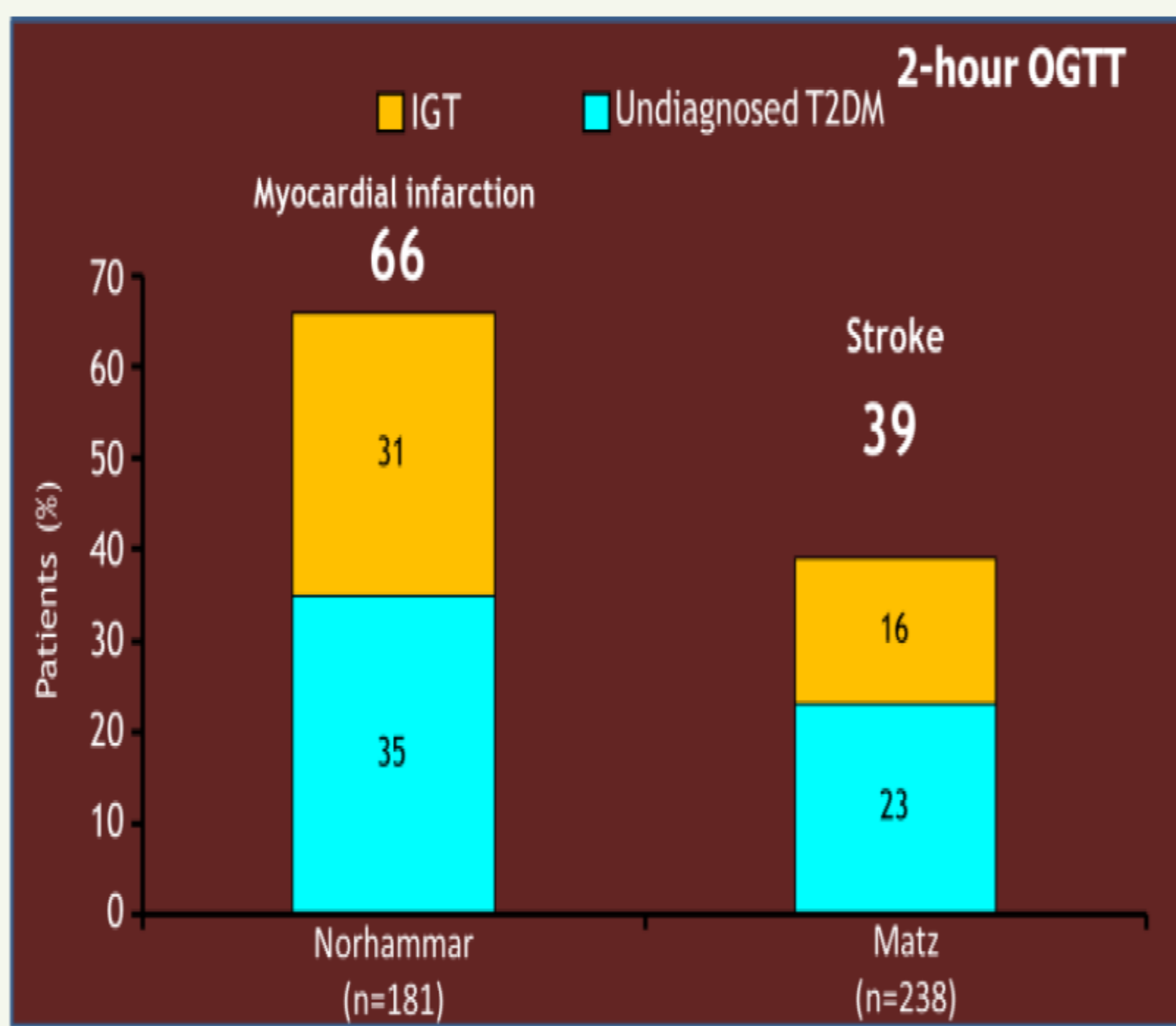


Figure 2. Response of patients with myocardial infarction and stroke to 2-hour OGGT Norhammar A, et al. (Lancet 2002;359:2140–4) and Matz K, et al. (Diabetes Care 2006;792–7).

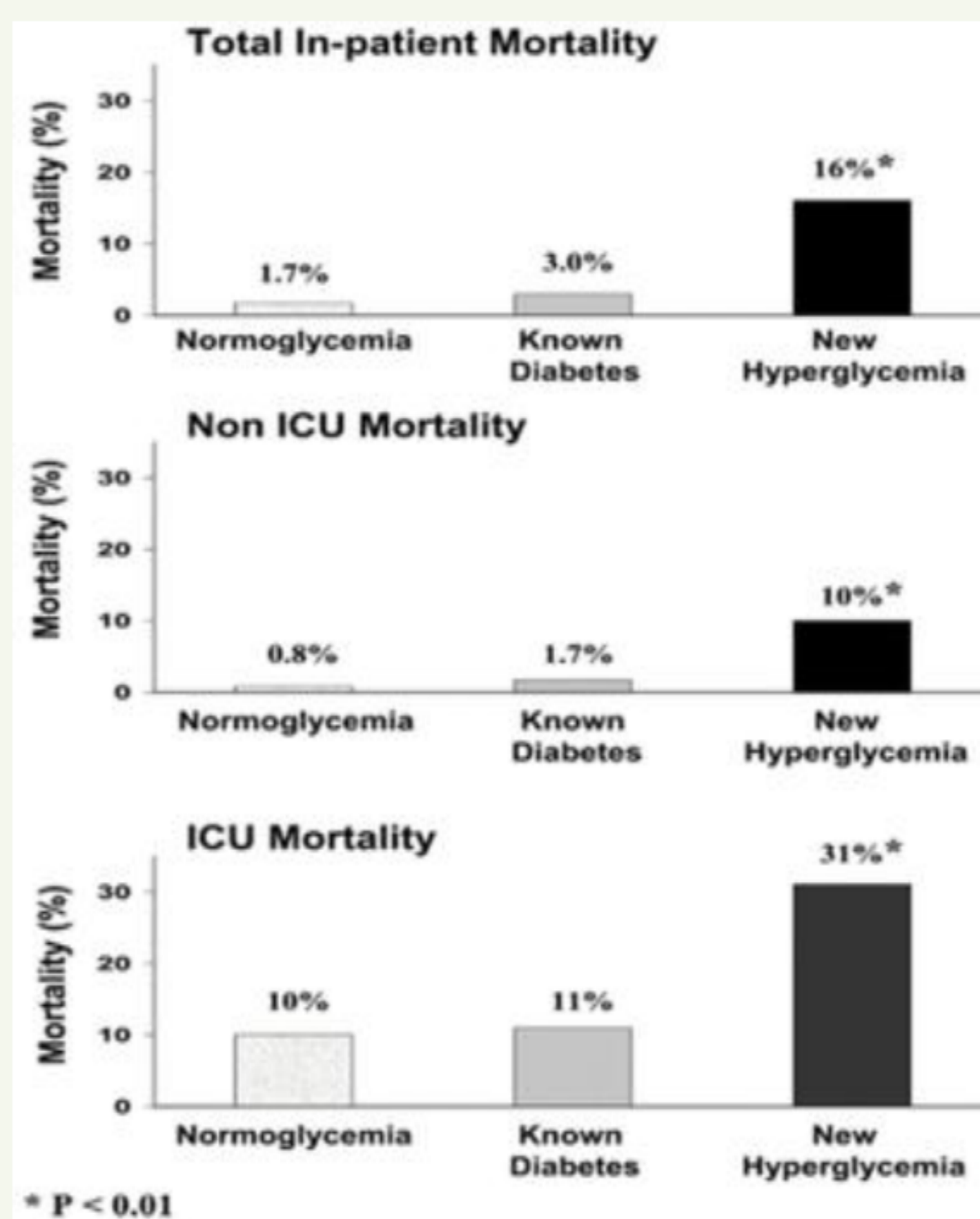


Figure 3. Hyperglycemia: An independent marker of in-hospital mortality in patients with undiagnosed diabetes(Umpierrez G et al, J Clin Endocrinol Metabol 87:978, 2002) .

## References

1.AACE and ACE staement on inpatient glycaemic control, endocrine practice,vol 15 No. 4 May/June 2009 .

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