CONCEPTS IN HYPERTENSION

A Journal Article Based Approach to Understanding the Clinical Aspects of Hypertension

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## Article of Interest Click

Hirsch, et al. Higher Glycemic Thresholds for Symptoms During β-Adrenergic Blockade in IDDM. Diabetes. 1991. (Click To Access)

## Context and Study Objective

Concerns regarding β-blockers' tendency to increase the frequency or severity of hypoglycemic unawareness among insulin dependent diabetics have limited their use. This paper evaluated the effect of propranolol on the level at which such patients developed symptoms from hypoglycemia.

## Main Outcome

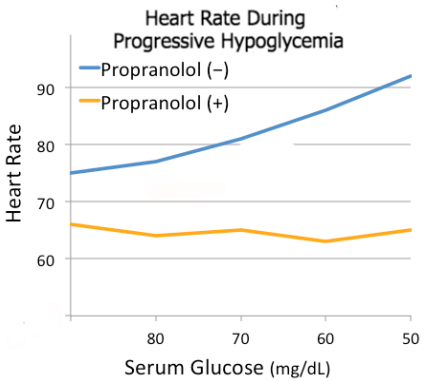
Changes in the glycemic threshold provoking symptomatic (diaphoresis, palpitations) hypoglycemia among insulin dependent diabetics treated with the non-selective β-blocker propranolol.

## Design, Setting, and Participants

Progressively lower levels of serum glucose were induced via insulin infusion with and without propranolol co-administration. The physiologic response/symptoms experienced were noted. Individuals with absolute hypoglycemic unawareness were excluded.

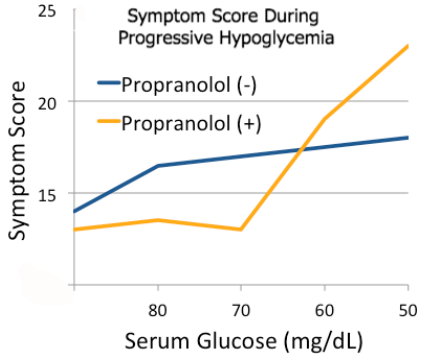
## Results

-Seventeen individuals were studied with a mean age of 24. Average duration of diabetes was 12 years. Mean A1c was 9.2%.
-Top Figure: Propranolol treated patients had lower basal heart rates (HR). With progressive hypoglycemia, HR rose among untreated individuals but did not among those on propranolol.
-Bottom Figure: Compared to untreated patients, propranolol exposed patients did not develop hypoglycemic symptoms until lower glucose levels were reached.
-While those administered propranolol began experiencing symptoms at lower glucose levels, the severity of symptoms, once present, was greater.




## Clinical Perspective

-Mechanistically, β-blockers prevent the compensatory sympathetic surge triggered by hypoglycemia. As such, symptoms characteristic of the sympathetic state are blunted.
-While the above results are concerning, I do not view them as an absolute contraindication to β-blocker use. Rather, they inform my management. Prior to therapy initiation, I identify individuals at high risk for hypoglycemia (insulin dependence, the elderly, brittle diabetics) and monitor them more closely. I instruct them to check their glucose frequently during β-blocker initiation and insulin dose titration; I also inquire about the above during follow up visits.
-Limitations: It is unclear if the study was blinded. Since it was conducted in those on insulin mono-therapy, it may not apply to those on oral agents.While a non-selective β-blocker was used, only limited evidence suggests β1 selective agents (metoprolol, atenolol) avoid these adverse events.





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