Control of Hypertension during Open Heart Surgery Comparative Study between Isradipine and Sodium Nitroprusside

Thesis Submitted for Partial Fulfillment of the M.D. Degree in Anesthesia

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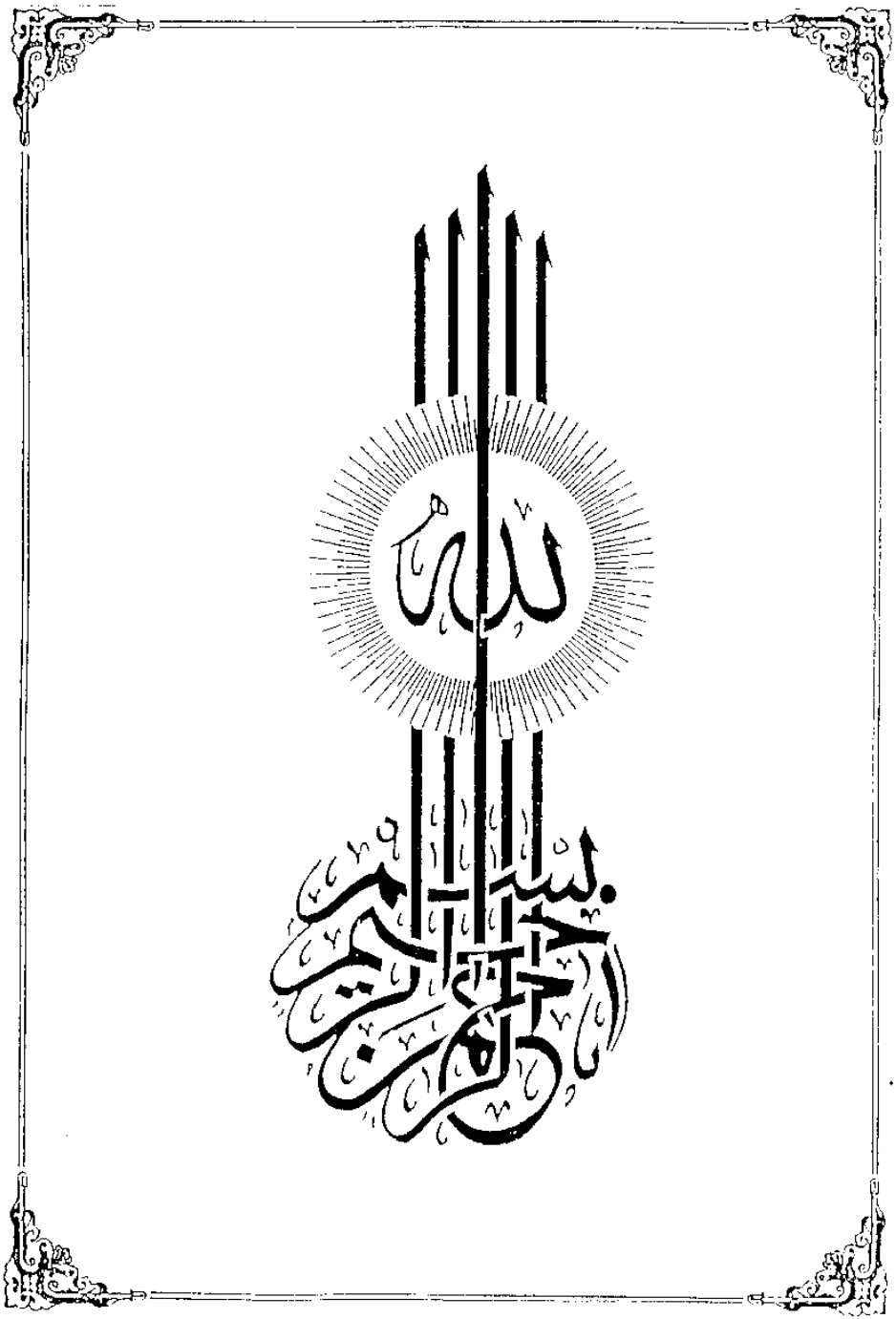

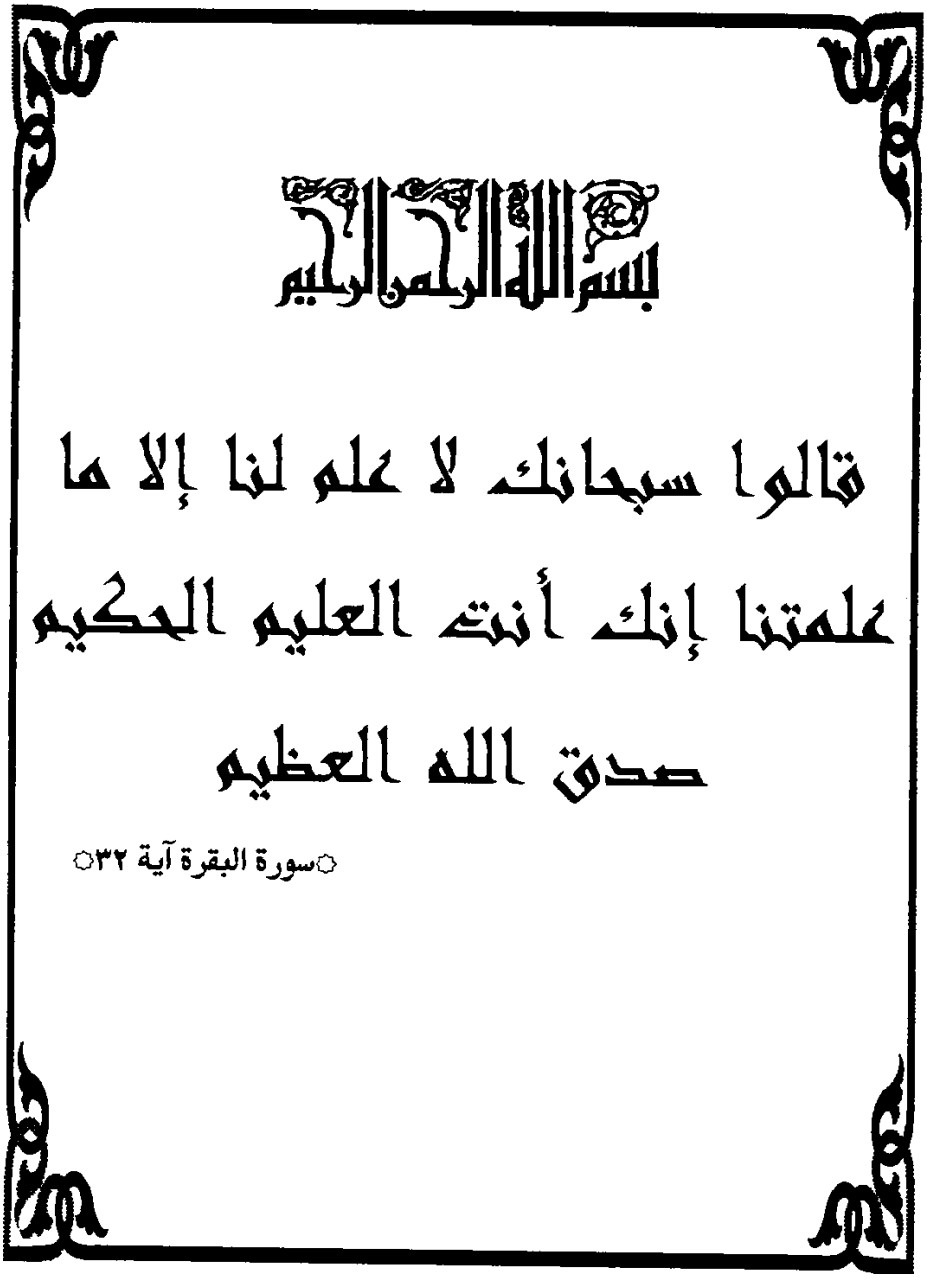

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Introduction

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The ideal agent for treating perioperative hypertension should be able to reverse the systemic vasoconstriction commonly seen after cardiac and non-cardiac surgery. In addition the drug should have a specific effect on the resistance vessels without affecting either the venous capacitance bed, or metabolic and electrolyte balance.

The calcium antagonists represent an important group of drugs with arterial vasodilating actions, the new intravenous dihydropyridine members are specially promising as they have no negative inotropic effect and minimal or no chronotropic effect. In addition their potential anti - inflammatory and cytoprotective effects may make them the ideal agents for the treatment of acute perioperative hypertension. ***(Wingard, et al., 1991)***

Calcium antagonist have been used successfully to control hypertension as a direct vasorelaxant with subsequent fall in systemic vascular resistance (afterload), which bind specifically to calcium channel in the membrane of vascular smooth muscles, thereby preventing calcium ions entry from the extracellular space. ***(Gilman, et al., 1990)***

In many situations the balance between myocardial oxygen supply and demand may be more critical than the absolute blood pressure, an inadequate blood supply or increase oxygen demand may exceed the capacity of the coronary arteries to provide the required blood flow.

Ischemia and potential infarction may result from either hypotension, stress of tachycardia, increased contractility and increase in wall tension during hypertensive episodes. Perioperative hypertension or hypotension is a pathophysiologic state that warrants rapid assessment and appropriate treatment. ***(Knight, et al., 1988)***

Isradipine is a new member of dihydropyridine calcium antagonists that is recently introduced to control hypertension during open heart surgery and in this study we will evaluate its hemodynamic effects by comparing it to the known direct vasodilator sodium nitroprusside, and we expect some advantages of isradipine over sodium nitroprusside regarding its effects on mean arterial blood pressure and systemic vascular resistance. Changes in pulse rate and cardiac output may favour the use of the new drug to control intra-operative hypertension in many occasions.