

AIN SHAMS UNIVERSITY  
FACULTY OF MEDICINE

# THE ROLE OF INTRAVENOUS DILTIAZEM FOR ACUTE CONTROL OF RAPID ATRIAL FIBRILLATION

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THESIS  
Submitted in partial fulfillment  
For Master Degree  
IN  
Cardiology

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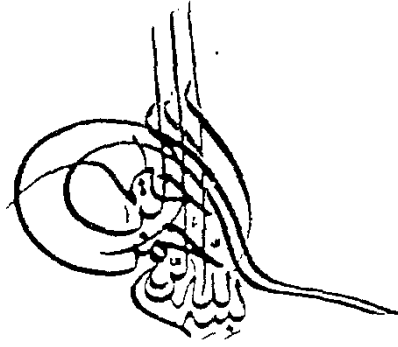
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« قَالَ تَعَالَى »

وَيَسْأَلُونَكَ عَنِ الرُّوحِ قُلِ الرُّوحُ مِنْ أَمْرِ رَبِّي وَمَا أُوتِيتُمْ  
مِّنَ الْعِلْمِ إِلَّا قَلِيلًا ﴿٨٥﴾

« صدق الله العظيم »

« سُورَةُ الْإِسْرَاءِ »



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*TO ALAH*  
*THEN*  
*TO MY FAMILY*

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# *AIM OF THE WORK*

\* Calcium ions play a critical role in many vital biologic processes in all cells. Within the cardiovascular System, calcium is importantly involved in the activation of cardiac cells, the genesis of the action potential, the coupling of electrical activation to myocardial contraction and the constriction of vascular smooth muscle. Calcium antagonists, which block the entry of calcium into cardiac and smooth muscle cells, represent one of the most important developments in cardiovascular therapeutics in the latter half of this century (Braunwald E, 1987).

#### \* TERMINOLOGY AND CLASSIFICATION :

In the 1960<sub>s</sub> the concept of calcium antagonism was pioneered in Europe independently in Fleckenstein 's and Godfraind 's laboratories, by studies on cardiac muscle and on vascular smooth muscles. Drugs of several chemical families have been identified as calcium antagonists. (Godfraind T, 1987).

A calcium antagonist, a compound that does not necessarily (and in fact is unlikely to) compete with  $\text{Ca}^{2+}$  for a binding site may be defined as a drug that alters the cellular function of calcium, by inhibiting its entry and [or] its release and [or] by interfering with one of its intracellular actions. Subgroups of calcium antagonists can therefore be defined. Those that specifically inhibit  $\text{Ca}^{2+}$  entry into cells

due to tissue excitation by various stimuli have been called calcium entry blockers (Godfraind T, 1981). This antagonistic activity is most likely due to interaction with calcium channels activated by membrane depolarization or by receptor stimulation, and, in these circumstances, these agents may also be termed calcium channel blockers or inhibitors. When blockade occurs at the level of the "slow" channels in cardiac tissues, the term slow channel blockers has been used (verapamil, nifedipine, diltiazem and some of their derivatives). The designation "calcium agonist" has been introduced recently to characterize dihydropyridine derivatives that increase the probability of calcium channel opening instead of blocking them. The whole group of agents affecting calcium movements has received the general denomination of calcium modulator (Godfraind T, 1986) which may be divided into facilitators or inhibitors "calcium antagonists".

A useful way to subclassify calcium modulators is to take into account the subcellular localization of their site of action "Table 1".

### \* AIM OF THE WORK

The aim of this study is to evaluate the efficacy and safety of intravenous diltiazem for acute control of rapid atrial fibrillation on the base of ventricular rate response.

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AND  
REVIEW OF LITERATURE*

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## \* CALCIUM ANTAGONISTS

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