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A Complete Guide on the Pharmacologic and Pharmacotherapeutic Aspects of Calcium Channel Blockers: An Extensive Review

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ABSTRACT

The calcium channel blockers, a diverse group of cardiovascular drugs, exert their action by inhibiting the L-type calcium channels and cause vasodilatation in the heart and in the smooth muscles. They also block the action potential at the SA and AV node, thus prolonging the duration of the action potential (Verapamil and Diltiazem). Although the calcium channel blockers have the same anti-hypertensive actions, they have a vast difference in their pharmacological actions, pharmacokinetic profile and adverse reactions. The main aim was to review, compare and understand the complete pharmacological profile of all the calcium channel blockers and understand their place in pharmacotherapy. Numerous articles and studies showed that amlodipine remains to be the safe and effective drug of choice in chronic hypertension due to its slow, prolonged duration of action and lesser incidence of reflux tachycardia. The newer calcium channel blockers, although similar to amlodipine in blood pressure lowering effect, have a number of pharmacological advantages. Felodipine was found to be slightly better than amlodipine in the treatment of ischemia/angina due to its high pre-load reducing effect. Lercanidipine was found to be a better reno-protective agent than amlodipine due to its actions in the kidney. Benidipine was found to be an excellent, anti-atherosclerotic and reno-protective agent. The incidence of baroreceptor activation and pedal edema was also found to be lower in the newer calcium channel blockers. Hence, the new generation calcium channel blockers despite nearly similar anti-hypertensive actionshas a number of additional potentially significant pharmacological actions and could become the preferred therapeutic options for hypertension induced renal and cardiovascular abnormalities. Thus, this extensive review could be a significant platform for initiating real time clinical evaluation of different pharmacological properties of these drugs thereby bringing in a paradigm shift and revolutionizing the CCB prescribing in the clinical setting.

Keywords: Novel calcium channel blockers, Pharmacology, Pharmacokinetics, Pharmacotherapeutics

Abbreviations: SA Node: Sinoatrial node; AV Node: Atrioventricular node; CCB: Calcium Channel Blockers

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