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Hemodynamics and Pharmacodynamics of Antiarrhythmic Drugs in Acute Myocardial Infarction

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AIM

In order to evaluate the efficacy and the inotropic action of antiarrhythmic drugs we studied in pts with acute MI the antiarrhythmic efficacy (AE) (% decrease of premature ventricular contractions, ventricular tachycardia and fibrillation) and the negative inotropic action (% decrease of cardiac index-CI) of four antiarrhythmic drugs: Cibenzoline (C), Flecinide (F), Mexiletine (M) and Propafenone (P) given to pts prophylactically during acute MI.

METHODS

These drugs were given randomly, single blinded, Placebo (PBO) controlled, in 109 pts, 58 males, 51 females, aged 73.2±12.1 (±SD). All pts were treated with basic conventional therapy plus one of the drugs (4 groups of 20) while 29 pts received PBO. Holter monitoring for 24 hrs was performed before drug administration and at least 4 days after initiation of therapy to assure that steady state drug plasma levels were reached. Cardiac output and index measured invasively were compared at admission and following 4-5 days of continued therapy. Statistical analysis was done using ANOVA.

RESULTS

AE was greatest (≥95%) for 3 of the drugs (C, F and P), lower for M (~90%) and PBO (~82%). CI decreased by 18.5%, 19.6%, 10.7%, 14.6% and 77% in the C, F, M, P and PBO group, respectively. Differences were significant ($p<0.001$) for C, F, P compared to PBO. Significant linear correlation was observed between AE and negative inotropic effect ($r=-0.91$, $p=0.03$).

CONCLUSIONS

AE is inversely proportional to mycoardial contractility. Any of these antiarrhythmic drugs is effective in preventing ventricular arrhythmias while M with lower AE has no significant negative inotropic effect. The most plausible explanation of this result is that the antiarrhythmic drugs of class Ic (C,F,P) interact not only with the Na^+ channels but also with the Ca^{++} ones with further decrease of myocardial contractility.