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Effect of Carvedilol on Outcome After Myocardial Infarction In Patients with Left Ventricular Dysfunction: The CAPRICORN Randomized Trial

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Study Design: CAPRICORN - Carvedilol Post-Infarct Survival Control in LV Dysfunction

- multicenter (17 countries)
- randomized
- placebo-controlled
- n= 1959 → 975 Carvedilol group
  984 Placebo group
- followed for mean ~1.3 yrs.

Study Population:

- 18 yrs. or older
- stable, definite MI w/in 3-21 days before randomization
- EF ≤ 40% by echo or radionuclide or contrast ventriculogram or wall-motion score index ≤1.3
  - actual average EF ~32.8%
- concurrent ACEI's ×48hrs. and stable dose ×24 hrs. unless proven ACEI intolerance
- included appropriately tx'd HFailure during the acute phase
- **Exclusions:**
  1. IV Diuretics / Inotropes for HFailure
  2. uncontrolled HFailure
  3. unstable Angina
  4. Hypotension (SBP <90)
  5. Uncontrolled HTN
  6. Bradycardia (HR <60)
  7. Unstable IDDM
  8. Continuing Indication For β-blockers other Than HFailure
  9. Inhaled β-2-Agonists or steroids

Study Protocol:

- initial dose : 6.25 BID
- returned Q3-10 days for reassessment
- -If HR ≥ 50 and SBP ≥ 80 → dose T'd to goal 25 BID
- Maintenance Period:
  - Q3 Months during year 1 then Q4 Months
- all patients → minimum 3 months of f/u
- 74% of patients reached 25 BID
- 11% of patients reached 12.5 BID
- 7% of patients reached 6.25 BID

Outcomes: 633 primary outcomes

A) Primary Outcomes:

① All-Cause Mortality - Better in Carvedilol group
- ↓23% RR reduction ($p = 0.031$)

Absolute RR @ 1-year 2.3% NNT = 43

② All-Cause Mortality or CV-Cause (Cardiovascular) Hospital Admission
- ϕ significant difference

B) Secondary Outcomes:

① Sudden Death : ϕ significant difference
② HFailure Hospital Admissions: ϕ significant difference
③ Death Due To HFailure : ϕ significant difference
④ CV-Cause Mortality - Better in Carvedilol group
- ↓25% RR reduction ($p = 0.024$)
⑤ Non-Fatal MI - Better in Carvedilol group
- ↓41% RR reduction ($p = 0.014$)
⑥ All-Cause Mortality or Non-Fatal MI - Better in Carvedilol group
- ↓29% RR reduction ($p = 0.002$)

All-Cause Mortality
(Primary Outcome: p = 0.031)

		Outcome	No Outcome	Risk of Outcome	Risk of Outcome
Treatment (Y)	||	116	859	0.11897	=a/(a+b)
Control (X)	||	151	833	0.15346	=c/(c+d)

RR (Relative Risk) or Hazard Ratio: 0.77530
RR = (a/a+b)/(c/c+d)

RRR (Relative Risk Reduction): 22.46969%
RRR = 1-RR x100 (%)

ARR (Absolute Risk Reduction): 3.44809%
ARR = (X Risk - Y Risk) x100 (%)

NNT (Number Needed to Treat): 29
NNT = 1/ARR

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Cardiovascular-Cause Mortality
(Secondary Outcome: p = 0.024)

		Outcome	No Outcome	Risk of Outcome	Risk of Outcome
Treatment (Y)	||	104	871	0.10667	=a/(a+b)
Control (X)	||	139	845	0.14126	=c/(c+d)

RR (Relative Risk) or Hazard Ratio: 0.75511
RR = (a/a+b)/(c/c+d)

RRR (Relative Risk Reduction): 24.48921%
RRR = 1-RR x100 (%)

ARR (Absolute Risk Reduction): 3.45935%
ARR = (X Risk - Y Risk) x100 (%)

NNT (Number Needed to Treat): 29
NNT = 1/ARR

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Non-Fatal MI
(Secondary Outcome: p = 0.014)

		Outcome	No Outcome	Risk of Outcome	Risk of Outcome
Treatment (Y)	||	34	941	0.03487	=a/(a+b)
Control (X)	||	57	977	0.05513	=c/(c+d)

RR (Relative Risk) or Hazard Ratio: 0.63259
RR = (a/a+b)/(c/c+d)

RRR (Relative Risk Reduction): 36.74134%
RRR = 1-RR x100 (%)

ARR (Absolute Risk Reduction): 2.02539%
ARR = (X Risk - Y Risk) x100 (%)

NNT (Number Needed to Treat): 49
NNT = 1/ARR

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All-Cause Mortality or Non-Fatal MI
(Secondary Outcome: p = 0.002)

		Outcome	No Outcome	Risk of Outcome	Risk of Outcome
Treatment (Y)	||	139	836	0.14256	=a/(a+b)
Control (X)	||	192	792	0.19512	=c/(c+d)

RR (Relative Risk) or Hazard Ratio: 0.73064
RR = (a/a+b)/(c/c+d)

RRR (Relative Risk Reduction): 26.93590%
RRR = 1-RR x100 (%)

ARR (Absolute Risk Reduction): 5.25578%
ARR = (X Risk - Y Risk) x100 (%)

NNT (Number Needed to Treat): 19
NNT = 1/ARR