ARTICLE:

- **Country**: Leicester, UK (England)
- **Funding Sources**: Not specified

PURPOSE:

- **Hypothesis**:
  - That IV magnesium reduces early mortality in suspected acute myocardial infarction *(28 day mortality)*
  - That progression to acute MI among patients with unstable coronary artery disease can be reduced with magnesium
  - That IV magnesium reduces the frequency of clinically important *early arrhythmias* in patients presenting with suspected myocardial infarction

DESIGN:

- **Study Design**: randomized double blind placebo controlled study
- **Dependent / outcome Variable(s)**: 28-day mortality, progression, and arrhythmias
- **Independent / research Variable**: administration of IV magnesium sulfate

SETTING / SUBJECTS:

- **Research Setting**: Large coronary care unit that admits 1000 patients/year, 50% who are diagnosed with AMI; Leicester Royal Infirmary
- **Subjects**:
  - **Study population**: 1987-1992
  - **Inclusion / Exclusion criteria**:
    - Inclusion: had to have an acute MI with onset in last 24 hours (no ecg criteria specified)
    - Exclusion: no consent; heart block; high creatinine (if discovered, remained in intention to treat); other indication for Mg
  - **Number (control / intervention groups)**: 2316 patients total; 1157 (placebo); 1159 (Mg)
  - **Demographics**: Essentially the same; see Table II
  - **Attrition**: 100% followed to hospital discharge and 99.3 followed to 28-days.
METHODS:
- **Interventions**: 8 mmol magnesium sulfate (2g) over 5 minutes, followed by 64 mmol over 24 hours vs saline
- **Study Groups**: Mg vs placebo
- **Instruments**: Computerized data system; National Health Service Central Registrar for 28-day deaths as well as general practitioners, hospital, health authority
- **Data Collection**: not indicated; electronic as above

DATA ANALYSIS:
- **Level of Data**: Categorical: 28-day mortality
- **Statistics Used**: Significance tests of mortality; odds ratios; intention to treat analysis
- **What, if any, variables were controlled for?** None

RESULTS:
- **Brief answers to research questions**: Magnesium decreases 28-day mortality. 10.3% (118 pts) placebo vs 7.8% (90 pts) Mg = 24% relative reduction, 0.74 OR (2p = 0.04; i.e. p<0.05)
- **Additional findings**: Less LV failure; more bradycardia without more AV block; higher serum magnesium levels. More atropine used. Less loop diuretics and nitroprusside used. NO difference in clinically significant arrhythmias, no change in progression. No difference in aspirin subgroup, people enrolled between 1987 – Sept 1988 (does not specify how many).
- **Other possible explanation for findings**: They conclude that because there was a high rate of follow-up and good randomization, there was no bias. They conclude that the benefit of magnesium on mortality is “similar to that achieved by thrombolytic drugs or aspirin.” Possible bias in unblinding due to flushing with Mg.
- **Limitations**: No

IMPLICATIONS FOR PRACTICE:
- **Applicable to this clinical practice**: This is not an ED population, but we do see patients in the first 24 hours of their AMI.
- **Feasible (cost, resources, etc)**: Yes. Low cost. Simple. Safe.
- **Clinically Relevant**: No. See ISIS-4, MAGIC

LEVEL OF EVIDENCE / DECISION FOR USE:
- **Consider Replication**
- **Level of Evidence**:
  - **Ib** Evidence obtained from at least one RCT