

Mortality Rates in Patients with STEMI Undergoing Primary PCI as a Function of the Hemoglobin Level: from Anemia to Polycythemia

Eli Lev, Ran Kornowski, Hana Vaknin-Assa, Shmuel Fuchs, Igal Teplitsky, David Brosh,
Alexander Battler, Abid Assali

Cardiology Department, Rabin Medical Center, Petach Tikva, Israel

Background: Anemia has consistently been shown to be a strong predictor of mortality after ST-segment elevation myocardial infarction (STEMI). In contrast, there is very limited information regarding the prognostic effect of polycythemia on outcomes of patients with STEMI. Since polycythemia is associated with a pro-thrombotic state, we hypothesized it will also be associated with increased risk of mortality and re-infarction in patients with STEMI undergoing primary percutaneous coronary intervention (PCI).

Methods: We studied 1,042 consecutive patients with STEMI treated with primary PCI, who were included in our primary PCI registry between 01/2001 – 11/2007. Excluded were patients with cardiogenic shock. Patients were allocated into 3 groups according to their baseline hemoglobin (Hg) level upon presentation: anemia (Hg<12 g/dl), normal (Hg=12-16 g/dl), polycythemia (Hg>16 g/dl). Clinical outcomes at 30 days and one year were assessed.

Results: Patients with anemia had higher risk clinical characteristics, except for smoking which was more prevalent among patients with polycythemia (Table). Mortality rates were highest among patients with anemia, followed by patients with polycythemia, who in-turn had higher mortality rates than patients with a normal baseline Hg level. Re-infarction rates were highest in patients with anemia, and similar in the two other groups (Table). When plotting mortality vs. baseline Hg level an inverse “J shaped” curve was obtained with higher mortality rates in the anemia side.

Conclusions: Both anemia and polycythemia are associated with increased mortality rates, and therefore, portend poor prognosis in patients with STEMI treated with primary PCI. However, anemia appears to be a stronger risk factor for mortality and re-infarction than polycythemia.

| | Anemia (n=138) | Normal (n=841) | Polycythemia (n=63) | P value |
|----------------------|-------------------|-------------------|------------------------|---------|
| Age (years) | 68±13 | 60±12 | 55±12 | <0.0001 |
| Women (%) | 43 | 15 | 16 | <0.0001 |
| Diabetes (%) | 40 | 24 | 16 | <0.0001 |
| Hypertension (%) | 64 | 42 | 44 | <0.0001 |
| Hyperlipidemia (%) | 42 | 46 | 46 | 0.6 |
| Current Smoker (%) | 23 | 47 | 62 | <0.0001 |
| Ant. Wall MI (%) | 51 | 46 | 60 | 0.3 |
| Outcomes: | | | | |
| 30 day mortality (%) | 7.3 | 2.4 | 4.8 | 0.01 |
| 30 day re-MI (%) | 8 | 2.3 | 3.2 | 0.001 |
| 1 year mortality (%) | 13.1 | 5.9 | 8.9 | 0.02 |
| 1 year re-MI (%) | 14 | 6 | 7 | 0.01 |