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## Acute myocardial infarction: The association of changes in K<sup>+</sup> levels and in-hospital mortality of patients with acute myocardial infarction

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**Background:** Serum potassium levels (K, mEq/L) of patients with acute myocardial infarction (AMI) were found to be associated with short- and long-term outcomes. Nevertheless, significant fluctuations in K have been reported during the acute phase of an AMI.

**Aims:** To evaluate the association between K changes during the hospitalization and in-hospital mortality of patients admitted with AMI.

**Methods:** AMI patients hospitalized in a tertiary medical center, between 2002 and 2012, for 3 days or longer, were studied. Based on K levels during the hospitalization, the following parameters were calculated: minimal, maximal, range (maximal-minimal) and fluctuation (the gap between two consecutive K levels). The latter parameters were calculated for every K throughout the hospitalization. The associations between the parameters and outcome were assessed using generalized estimating equations model, adjusted to baseline patients' characteristics and results of other routine laboratory tests (i.e. Sodium, Creatinine and Glucose).

**Results:** Overall 16,596 admissions of 12,176 patients were included (age 67.8±13.9 years, 66.6% males) and 111,457 K results registered. Overall, patients discharged alive from 15,564 admissions, with an in-hospital mortality rate of 6.2%. Compared with survivors, in-hospital mortalities had higher mean K (4.4±0.8 vs. 4.3±0.6), higher rate of fluctuation or range ≥0.4 (p<0.001 for each). Minimal K throughout the first 48 hours was significantly more prevalent among survivors compared to deceased (41% vs. 25% p<0.001). In a multivariate analysis the following parameters were found to be independent prognostic marker for mortality: K<3.9 (adjOR=1.22) or K>4.8 (adjOR=1.17), range ≥0.8 (adjOR=1.53) and minimal K during the first 2 days of admission (adjOR=1.49). Furthermore K fluctuation ≥0.4 was associated with increased mortality within the following 72 hours (adjOR=1.37), (p<0.001 for each).

**Conclusions:** Changes in K, in addition to extreme values throughout an admission of AMI patients are strong prognostic markers of in-hospital mortality. Close monitoring of K in addition to further evaluation of mechanisms and interventions in K are in order.

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