In-Hospital Mortality for AMI in Switzerland: is Outcome Related to Admission During Routine Duty Hours versus Off-Hours

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Background: A circadian variation in the time of onset of AMI with a peak in the morning hours has been reported. We sought to investigate the impact of circadian patterns on the outcome of patients treated, and specifically the quality of care given during routine duty hours versus off-hours.

Methods: From the AMIS-Plus database, 7,368 patients with ST-elevation MI or new LBBB admitted in 62 hospitals (January 1997 to December 2003) throughout Switzerland were extracted.

Results: The characteristics of the population of patients admitted to hospital during routine duty hours (7am-7pm: Population 1) and off-hours (7pm-7am + Weekends: Population 2) are shown in this table:

	Population 1	Population 2	
Number of cases	3806 (51.7%)	3562 (48.3%)	
Gender: male/female	71.2% / 28.8%	74.9% / 25.1%	p=0.003
Age mean ± sd (median)	64.4 ± 13.1y (66y)	62.7 ± 13.1y (63y)	p<0.0001
Killip class			p=0.03
Class I	74.2%	74.9%	
Class II	19.2%	17.2%	
Class III	3.9%	5.0%	
Class IV	2.6%	2.9%	
Delay (median)	4:00 h	3:10 h	p<0.0001
Thrombolysis	36.7%	45.8%	p<0.0001
PCI primary	26.2%	22.5%	p<0.0001
Re-infarction	4.0%	3.8%	p=0.68
Stroke	1.5%	1.6%	p=0.64
In-hospital Mortality	9.2%	9.4%	p=0.68

Population 2 (Off-Hours) differs, being composed of more young male, presenting earlier and treated more often with thrombolysis than primary PCI. Despite these differences, mortality was similar. Incidence of cardiogenic shock 11.7% vs. 12.8%, re-infarction 4.0% vs. 3.8% and stroke (1.5% vs. 1.6%) were not statistically different between populations. Major cardiac adverse events (re-infarction, stroke and death) occurred in 7.0% of patients who had primary PCI (p=0.997) during routine duty hours and was the same for patients who had primary PCI during off-hours. In a multivariate logistic regression model the independent in-hospital mortality predictors were age >65 y (OR 4.23 [0.36-5.9] p<0.001) and Killip class (OR 1.82 - 2.81 p<0.001). Thrombolysis (OR 0.49 [0.36-0.67] p<0.001) and PCI (OR 0.30 [0.19-0.46] p<0.001) were associated with decreased mortality. Working time (OR 0.89 [0.68-1.17] p=0.41), gender (OR 0.81 [0.62-1.07] p=0.15), diabetes (OR 1.27 [0.93-1.73] p=0.13), hypertension (OR 1.03 [0.077-1.35] p=0.87) and hospital type (OR 0.90 [0.68-1.20] p=0.48) were not independently related to mortality in this collective.

Conclusion: In Switzerland, population and reperfusion strategies are different during duty hours than off-hours, with no impact on survival.