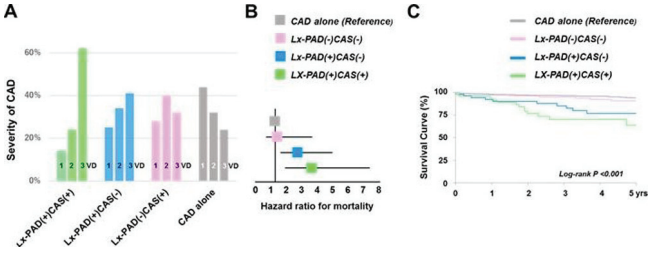
with Lx-PAD(+)/CAS(–), 122 (17%) patients with Lx-PAD(–)/CAS(+), and 514 patients with CAD alone. There was significant deference in age (78±8 vs. 75±11 vs. 70±10 vs. 65±12, p<0.001) and the prevalence of diabetes mellitus (61% vs. 52% vs. 41% vs. 35%, p<0.001) between these groups. In the coronary angiography, there were significant difference in disease severity between these groups (Figure A). During the median 4-year follow-up, there were 54 incidents of all-cause death. Compared with the patients CAD alone, as a reference groups, patients with Lx-PAD(+)/CAS(+) and Lx-PAD(+)/CAS(–) had two to four-fold higher increase in the risk of death (hazard ratio [HR], 3.56; 95% confidence interval [CI], 1.68–7.27; p=0.001 and HR, 2.41; 95% CI, 1.06–5.12; p<0.05, respectively), whereas the presence of CAS does not increase the risk of death (Figure B). The freedom from all-cause death stratified across the presence or the absence of extra-cardiac disease is shown (Figure C).



Conclusion: These results demonstrate that presence of lower extremity PAD, as compared with CAS, is associated with worse prognosis in patients presenting as ACS.

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Trends in prevention after acute myocardial infarction in patients with reduced left ventricle ejection fraction in Poland

M. Gasior[1], M. Gierlotka[1], T. Zdrojewski[2], P. Jankowski[3], L. Pyka[1], P. Rozentyt[1], B. Wojtyniak[4], J. Kazmierczak[5], G. Opolski[6], P. Hoffman[7], Z. Kalarus[1], M. Zembala[1], J. Niedziela[1], L. Polonski[1], P. Ponikowski[8] on behalf of PL-ACS & AMI-PL Investigators. *[1]Medical University of Silesia, Silesian Center for Heart Diseases, Zabrze, Poland; [2]Medical University of Gdansk, Gdansk, Poland; [3]Jagiellonian University Medical College, Krakow, Poland; [4]National Institute of Public Health - National Institute of Hygienef Public Health - National Instit, Warsaw, Poland; [5]Pomeranian Medical University, Szczecin, Poland; [6]Medical University of Warsaw, Warsaw, Poland; [7]Institute of Cardiology, Warsaw, Poland; [8]Wroclaw Medical University, Wroclaw, Poland*

According to guidelines, patients with LVEF ≤40% particularly require coordinated actions in the field of secondary prevention of further episodes of acute ischemic events as well as primary and secondary prevention of sudden cardiac death, which are not always implemented in a daily clinical practice. The purpose of this analysis is to examine how the ESC recommendations are implemented in terms of prevention after AMI, depending on the degree of LVEF impairment in recent years in Poland.

Methods: To carry out this analysis data from two national registries, PL-ACS and AMI-PL, were combined. Polish Registry of Acute Coronary Syndromes (PL-ACS) is an ongoing (since 2003) clinical registry, however it does not cover all hospitals. AMI-PL is a nationwide database of the administrative data, derived from the only, public, obligatory, health insurer in Poland (National Health Fund), and provide data on index and follow-up hospitalizations, procedures, and deaths for all Polish patients hospitalised due to with AMI in 2009–2013. From 151,554 patients with a first myocardial infarction 141,697 were discharged home (93.5%) and among them information on LVEF was available in 112,056 patients. Index AMI hospitalization included the continued in-patient stay, through the possible transfers between wards or hospital for any reasons, until discharge home or death.

	LVEF	2009	2010	2011	2012	2013	Total
Number of patients discharged home after AMI with known LVEF		24982	30532	27675	31063	27445	141697
Distribution of LVEF in patients discharged home after AMI	>40%	73.8%	74.2%	75.6%	75.2%	75.6%	74.9%
	36-40%	12.0%	12.1%	11.1%	12.0%	11.4%	11.7%
	31-35%	5.7%	5.4%	5.2%	5.2%	5.2%	5.3%
	26-30%	4.5%	4.4%	4.5%	4.2%	4.2%	4.3%
	<=25%	4.0%	3.9%	3.6%	3.5%	3.8%	3.7%
Revascularization (PCI or CABG) during 12 months after discharge	>40%	24.6%	26.1%	26.9%	27.6%	27.6%	26.7%
	36-40%	24.0%	23.9%	26.4%	25.7%	25.6%	25.2%
	31-35%	22.3%	23.8%	25.6%	24.7%	25.0%	24.3%
	26-30%	19.9%	21.1%	22.8%	24.5%	21.3%	22.1%
	<=25%	17.5%	16.9%	17.9%	21.7%	20.6%	19.0%
ICD or CRT-D implantation during initial hospitalization due to AMI	>40%	0.07%	0.03%	0.04%	0.03%	0.07%	0.05%
	36-40%	0.19%	0.29%	0.16%	0.19%	0.23%	0.21%
	31-35%	0.50%	0.96%	0.60%	0.15%	0.41%	0.52%
	26-30%	0.63%	0.59%	1.20%	0.47%	0.62%	0.70%
	<=25%	1.58%	2.78%	1.00%	2.12%	1.14%	1.75%
ICD or CRT-D implantation during 12 months after discharge	>40%	0.3%	0.3%	0.2%	0.3%	0.3%	0.3%
	36-40%	1.8%	1.7%	1.6%	1.8%	1.8%	1.7%
	31-35%	5.4%	3.2%	4.2%	7.0%	5.7%	5.1%
	26-30%	7.5%	7.5%	8.0%	9.3%	12.1%	8.9%
	<=25%	13.3%	14.1%	15.6%	15.8%	18.4%	15.5%
Cardiac rehabilitation during 12 months after discharge	>40%	29.6%	26.9%	21.4%	24.3%	28.2%	25.9%
	36-40%	27.6%	25.9%	22.9%	21.6%	26.4%	24.7%
	31-35%	22.3%	22.0%	20.0%	19.0%	24.6%	21.5%
	26-30%	21.0%	19.2%	17.6%	17.6%	19.3%	18.8%
	<=25%	13.8%	15.1%	13.1%	13.5%	14.1%	13.9%
Number of out-patient cardiology visits during 12 months after discharge	>40%	2.0	1.7	1.6	1.6	1.6	1.7
	36-40%	1.9	1.6	1.4	1.5	1.4	1.6
	31-35%	1.7	1.6	1.5	1.5	1.5	1.6
	26-30%	1.6	1.4	1.4	1.5	1.6	1.5
	<=25%	1.7	1.6	1.4	1.6	1.7	1.6
12-month mortality after discharge	>40%	4.9%	4.4%	4.8%	5.0%	4.6%	4.8%
	36-40%	10.1%	10.3%	10.2%	12.2%	9.3%	10.5%
	31-35%	15.7%	14.7%	13.6%	14.5%	14.1%	14.5%
	26-30%	21.6%	19.6%	18.9%	17.5%	18.7%	19.1%
	<=25%	26.5%	26.0%	25.3%	28.1%	24.5%	26.1%

Table 1. Trends in secondary prevention

Results (see Table 1). Percentage of AMIs treated with invasive strategy in acute phase raised substantially from 63% to 83% in NSTEMI and from 76% to 90% in STEMI during 2009 to 2013. The proportion of patients with LVEF ≤40% was 26.2% in 2009 and 24.4% in 2013 among those discharged home. The number of post-discharge revascularization procedures (CABG and PCI) increased slightly in subsequent years, and lower in patients with the lower LVEF. The proportion of ICD or CRT-D implantation during hospitalization was low, and among patients with LVEF ≤25% varied in different years between 1 and 3%. Within 12 months after discharge, ICD or CRT-D were implanted in approximately 0.3% of patients with LVEF>40% and 1.7% of those with LVEF = 36–40%, with no apparent differences between the years. However, among patients with LVEF ≤35% the increase in the percentage of implantation was observed, up to 15.5% in those with LVEF ≤25% in 2013. Cardiac rehabilitation in 2009–2013 was more frequent in patients with not or only slightly reduced LVEF. The average number of cardiology out-patient visits (refunded by the National Health Fund) was not related to LVEF and varied from 1.4 to 2.0. Every fourth patient discharged with LVEF <25% died during the year after AMI.

Conclusions: In Poland in recent years there has been a slight improvement in secondary prevention after myocardial infarction. Nevertheless, still in substantial number of patients the ESC guidelines are not implemented. Therefore, a government programme of coordinated care for patients with AMI is about to be initiated.

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Risk of death and cardiovascular events among patients presenting with acute coronary syndrome: the evolving role of cystatin C, NGAL and galectin-3 as prognostic biomarkers

S. Obeid[1], A.E. Von Eckardstein[1], A.D. Denegri[1], Y.B. Bockhorn[1], R.K. Klingenberg[1], B.G. Gencer[2], F.M. Mach[2], L.R. Raeber[3], S.W. Windecker[3], N.R. Rodondi[3], D.N. Nanchen[4], C.M. Matter[1], T.F. Luescher[1]. *[1]University Hospital Zurich, Cardiology, Zurich, Switzerland; [2]Geneva University Hospitals, Geneva, Switzerland; [3]Bern University Hospital, Bern, Switzerland; [4]University Hospital Centre Vaudois (CHUV), Lausanne, Switzerland*

Background: Cystatin C, Galectin-3 and NGAL have been previously shown to be predictors of mortality and a worse cardiovascular outcome in the general population including those with a history of coronary artery disease (CAD). However, their predictive role in patients presenting with acute coronary syndrome is still to be determined.

Methods: 1832 patients from the prospective SWISS Special Program University Medicine (SPUM) cohort were included in our study. The cohort comprised only of those presenting with the diagnosis of acute coronary syndrome requiring percutaneous coronary intervention or coronary artery bypass graft. Cystatin C, NGAL and Galectin-3 were measured at baseline and all patients were followed up to 1 year.

Results: The primary end points of Major Adverse Cardiovascular Events and all-cause mortality occurred in 192 (10.5%) and 78 (4.3%) of patients at 1 year, respectively. Analysis of separate spline curves for hazard ratios, showed the presence of a nonlinear, dose-response relationship between serum Glactin3 levels and risk of MACCE and mortality. ROC curve analysis, on the hand did not show any significant difference (P_deLong=NS) between the studied markers for mortality (AUC_Galectin-3 0.751 vs AUC_CystatinC 0.761 vs AUC_NGAL 0.721) and MACCE (AUC_Galectin-3 0.622 vs AUC_CystatinC 0.632 vs AUC_NGAL 0.592).There was a significant correlation (p<0.001) between the markers, with the strongest being amongst NGAL and Cystatin C (r2=0.517),however, the level of collinearity was acceptable (VIF<5,Tolerance>0.2). In a multivariable Cox regression model, corrected for age, troponin, Galectin- 3, NGAL, Cystatin C, glomerular filtration rate, resuscitation, insulin dependent diabetes mellitus, history of malignancy, CABG, heart failure (EF<50%) and myocardial infarction, only Galectin-3 of the studied biomarkers was associated with a higher risk of MACCE HR 1.025 [95% CI (1.012–1.037) p<0.001] and all-cause mortality HR 1.027 [95% CI (1.011–1.043) p=0.001] at 1 year. To further substantiate our findings we divided the population according to quartiles of Galectin-3 (Q1: <11.5 ng/ml (n=459), Q2: 11.5–14.3ng/ml (n=458), Q3: 14.3–18.3ng/ml (n=442), Q4: >18.3 (n=452) and evaluated for the incidence of MACCE and death per quartile. There was a significantly (p<0.001) higher number of events within Q4 of Galectin-3 as compared to the lower three quartiles (16.8% vs 10% vs 8.7% vs 6.5%) and (10.2% vs 3.6% vs 2.4% vs 1.1%) for MACCE and all-cause mortality respectively.

Conclusion: Galectin-3 is a stronger predictor of all-cause mortality and cardiovascular outcome in patients with acute coronary syndrome, than NGAL and CystatinC.