





Predictors And Case Fatality Rate Of Perioperative Major Cardiovascular Events In Cardiac Patients Undergoing Non-Cardiac Surgery

Z. Motovska, <sup>1</sup>J. Jarkovsky, M. Ondrakova, J. Knot, L. Havluj, R. Bartoska, L. Bittner, R. Gurlich, V. Dzupa, R. Grill, P.Haninec, P. Widimsky Thrird Faculty of Medicine, Charles University and Univ. Hospital Kralovske Vinohrady, Prague,<sup>1</sup>Instit. of Biostatistics and Analyses Masaryk Univ., Brno, Czech Rep.

### BACKGROUND

- Preoperative risk-stratification to identify high-risk patients is used to improve perioperative management.
- The most-often used preoperative risk-stratification model was derived from a heterogeneous non-cardiac population, and prediction of cardiac events is notably less accurate for non-cardiac surgery patients.

### **OBJECTIVES**

 To identify predictors and case fatality rate of perioperative major adverse cardiovascular events (MACVE) (myocardial infarction, stroke, acute heart failure, venous thromboembolism, acute limb ischemia) in cardiac patients undergoing non-cardiac surgery.

### **METHODS**

- Analysis of prospective multicenter PRAGUE-14 study was performed.
- Demographic characteristics, cardiovascular risk factors, presence of CV diseases, significant comorbidity (presence of organ dysfunction, cancer), history of bleeding, type of surgery and long-term pharmacotherapy were included in the MACVE prediction model.

## Patients, type of surgery

N = 1211 (all pts. with CV disease undergoing major non-cardiac surgery during the study period 2011–13 (6,3% of 18 951 surgical pts) General anesthesia in 64,4%



#### Enrolling surgical departments:

General surgery (43,3% pts) Trauma / orthopedic surgery (39,9%) Urology (10,5%) Neurosurgery (5,5%) Anesthesiology (0,8%) <u>Study design, coordination, data</u> <u>analysis:</u> Cardiology





### Perioperative cardiovascular complications n = 91 (7.6%)



36 patients had  $\geq$  1 event.

### Predictors of ischemic complications

	OR (95% CI)					
0		5	10	15	р	
Age > 75 years				2.13 (1.36;		
Chronic lung disease				1.89 (1.10;		-
Valvular heart disease				1.72 (1.02;		۲
History of CAD and PCI		• •		1.67 (1.02;		-
Diabetes mellitus		<b>←</b>		1.37 (0.88;		
History of Bleeding		•		1.36 (0.17;	10.83) 0.773	
History of CAD and PCI/CABG	_	• <b>-</b>		1.34 (0.86;	2.10) 0.200	
History of MI	_	•		1.31 (0.83;	2.07) 0.243	
Atrial Fibrillation	_	<b>•</b>		1.31 (0.84;	2.04) 0.239	
Chronic liver disease	_	• <b></b>		1.26 (0.49;	3.24) 0.636	
History of CAD and CABG	_	<b>-</b>		1.19 (0.66;	2.16) 0.569	
Stroke	_	•		1.18 (0.61;	2.27) 0.630	_
Any vascular stent	_	-		1.14 (0.68;	1.89) 0.616	
Hematological disease	_	<b>–</b>		1.08 (0.61;	1.93) 0.790	
Women	-	<b>–</b>		1.05 (0.68;	1.61) 0.826	
Betablockers	-	<b>—</b>		1.01 (0.65;	1.56) 0.975	
Weight	•	•		0.99 (0.97;	1.00) 0.089	
Statins	-	_		0.94 (0.59;	1.51) 0.794	
Chronic kidney disease	-+	_		0.74 (0.35;	1.57) 0.440	
Pulmonary embolism				0.71 (0.25;	2.01) 0.523	
Cancer				0.69 (0.16;	2.91) 0.612	
Hypertension	+	•		0.69 (0.43;	1.11) 0.129	
Neurosurgery	-+-			0.62 (0.24;	1.59) 0.317	
BMI 25-30	+			0.55 (0.34;	0.89) <b>0.015</b>	
BMI >30	+			0.55 (0.31;	0.97) <b>0.041</b>	
Orthopedic-traumatological surgery	+			0.38 (0.23;	0.62) <0.001	
BMI < 19	•			0.35 (0.05;	2.64) 0.307	
Urological surgery	-			0.06 (0.01;	0.44) <b>0.006</b>	

# In-hospital mortality of patients with a cardiovascular disease (n=1200) vs. those without CVD (n=17740)



In-hospital mortality

### Case fatality (CFR) rate of perioperative MACVE

CFR of perioperative MACVE was 37.4%

MI was 16.7%,

Stroke 100%,

Pulmonary embolism 58.3%,

Acute heart failure 48.3%,

Acute limb ischemia 18.2%

### Ischemic complications as predictors of mortality



### CONCLUSIONS

- Case fatality rate of perioperative MACVE in cardiac patients undergoing non-cardiac surgery is extremely high,
- Integration of identified predictors of these complications, which do not replicate known cardiovascular risk factors, into the perioperative cardiovascular risk assessment and decision-making process may improve prognosis of these patients.

## **Causes of death**

n=47, i.e. 3.9%



## **Baseline characteristics**

Mean age	74,2 ± 10,2 years
Female sex	43,9%
Mean body weight	78,9 ± 16,2 kg
Diabetes mellitus	30,9%
Hypertension	77,8%
Chronic kidney disease	11,3%
Chronic liver disease	4,5%
Chronic pulmonary disease	12,9%
Current tumor	15,6%
Current hematologic disease	3,2%
History of any vascular stent implantation	14,3%
History of any previous bleeding requiring treatment	3,5%