



# IRON DEFICIENCY AS AN IMPORTANT FACTOR IN PATIENTS WITH MYOCARDIAL INFARCTION

## INTRO

Cardiovascular diseases, despite the continuous development of the health care sector responsible for them, are the main cause of death in Poland, accounting for almost 35% of all cases [1]. The most common one is coronary artery disease, the most dangerous form of which are acute coronary syndromes. Today's medicine focuses on modifying risk factors of a disease - one of which could be iron deficiency. Iron plays a key role in transport, oxygen storage, erythropoiesis and is a component of oxidative enzymes and oxygen chain proteins responsible for, among others, for intracellular respiration. Its deficiency may be a crucial prognostic factor in patients with acute myocardial infarction.

## PATHOPHYSIOLOGY

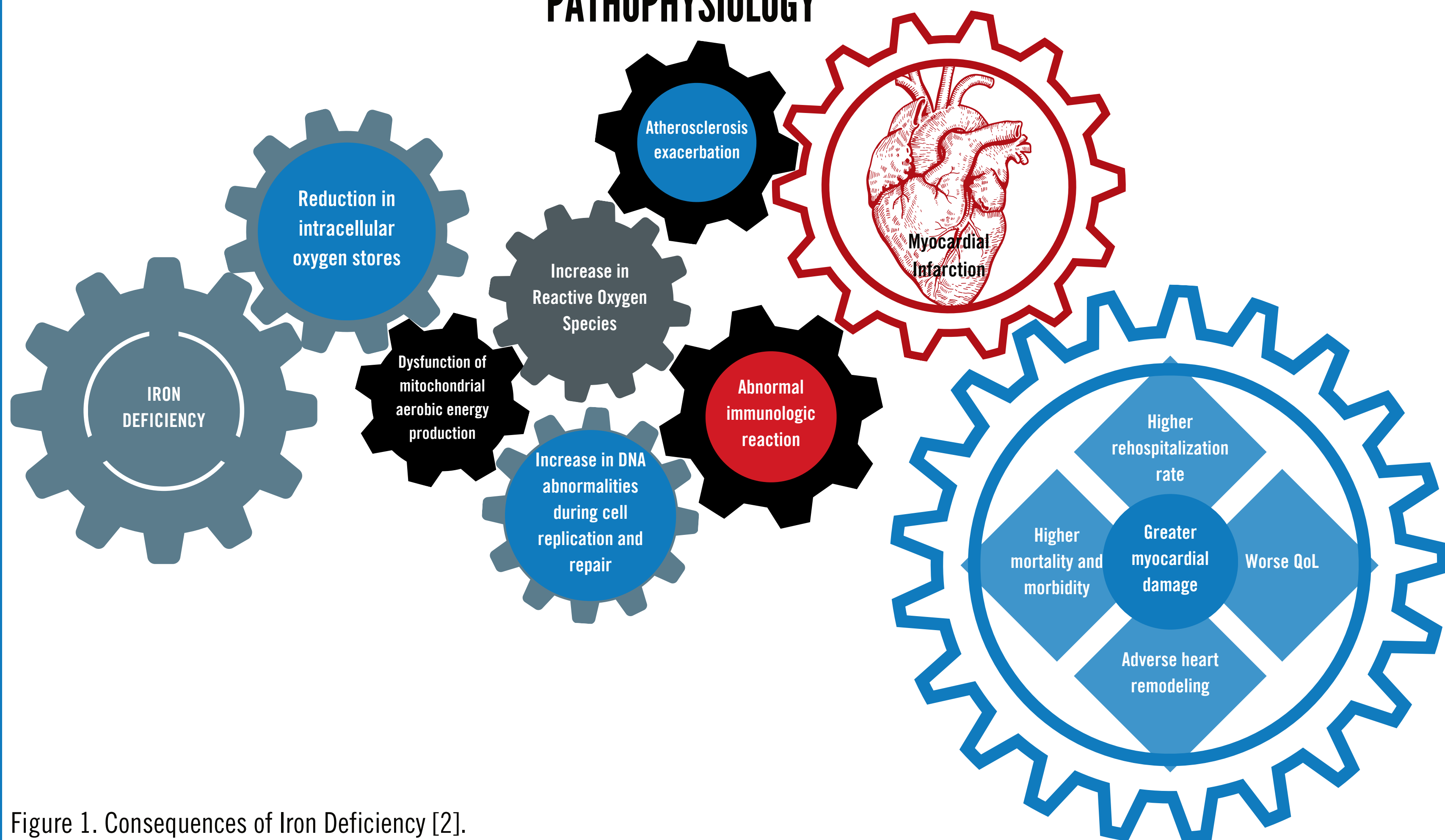
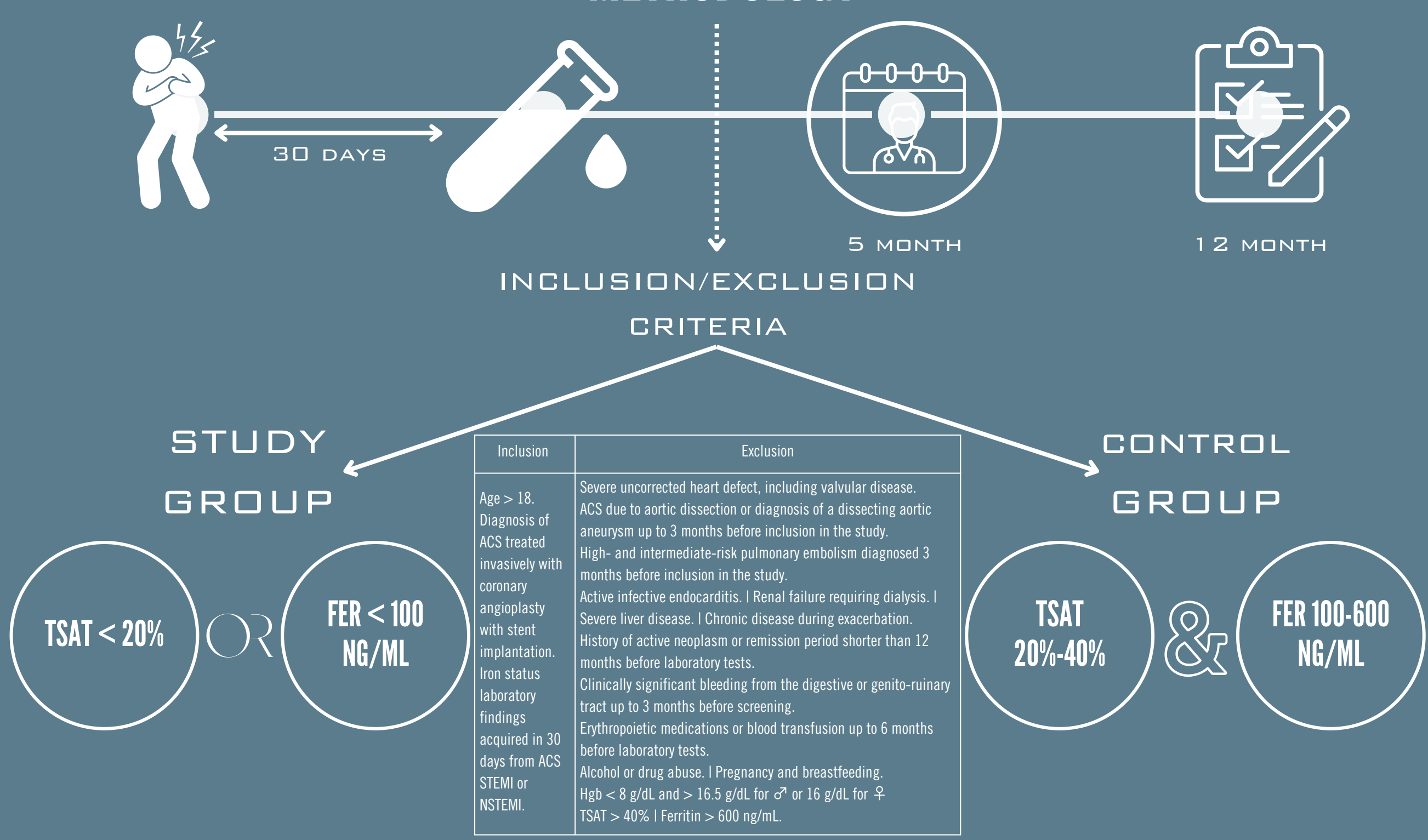


Figure 1. Consequences of Iron Deficiency [2].

## METHODOLOGY



## AIMS AND RESEARCH HYPOTHESIS

- To examine the incidence of iron deficiency in patients with acute myocardial infarction.
  - To examine the prognostic value of iron deficiency in patients with acute myocardial infarction during follow-up.
- Iron deficiency is a common comorbidity in patients with acute myocardial infarction and is associated with worse patient prognosis.

## REVIEW OF CURRENT PUBLICATIONS

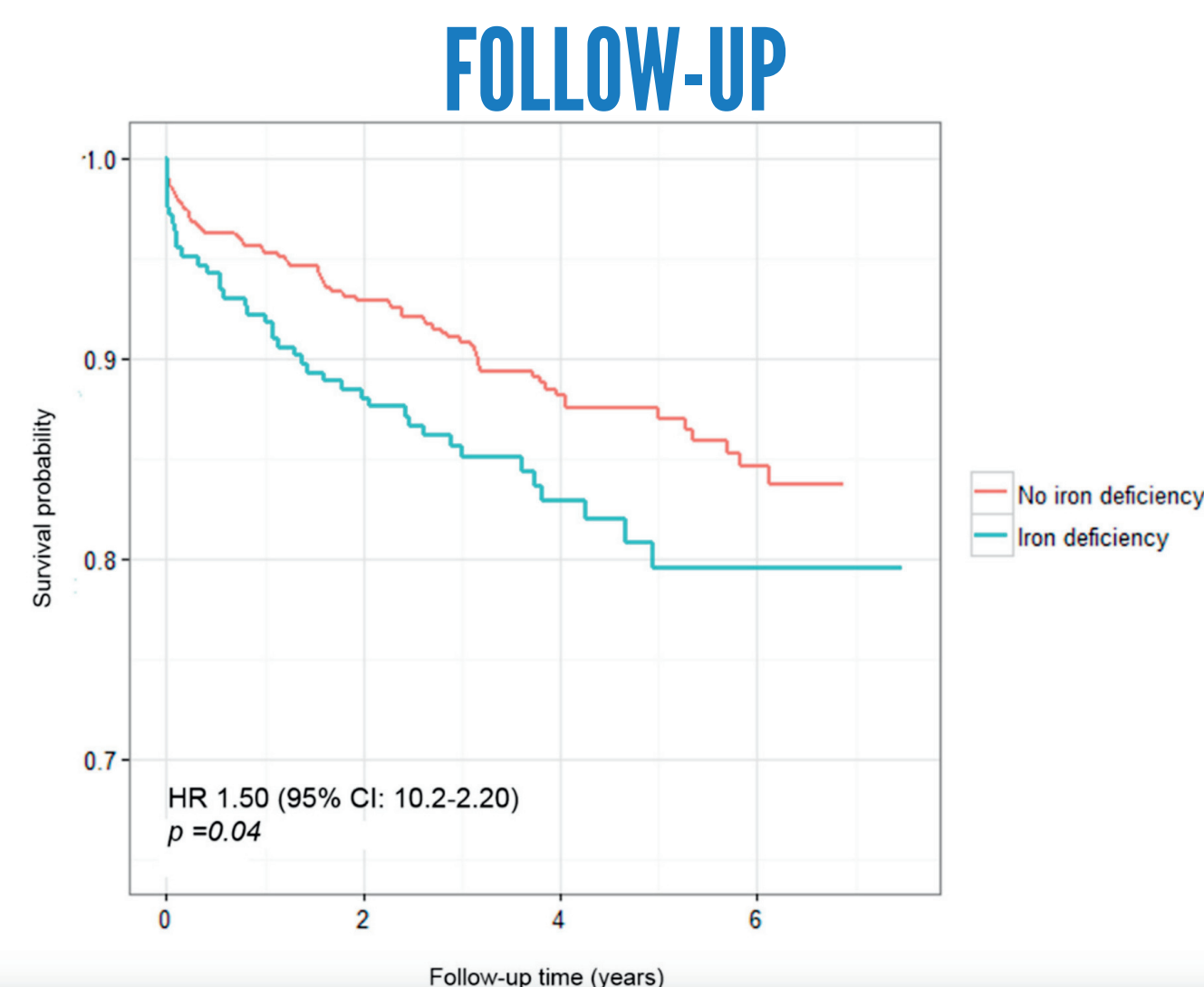
AUTHOR	CONSENTINO N [3]	MERONO O [4]	SILVA C [5]	D'GREGORIO J [6]	ZELLER T [7]
YEAR	2019	2016	2019	2018	2018
STUDY TYPE	PROSPECTIVE OBSERVATIONAL	PROSPECTIVE OBSERVATIONAL	RETROSPECTIVE	PROSPECTIVE OBSERVATIONAL COHORT	PROSPECTIVE OBSERVATIONAL COHORT
POPULATION	420	244 -> 226	817	252	836
ID (%)	237 (56%)	139 -> 102 (57%->46%)	298 (36%)	N/D	243 (29.1%)
OBSERVATION TIME	ACS-RELATED HOSPITALISATION	30 DAYS	2 YEARS	IQR: 2-5,4 YEARS	4 YEARS
CONCLUSIONS	ID IN ACS IS ASSOCIATED WITH BETTER IN-HOSPITAL PROGNOSIS.	ID IS ASSOCIATED WITH WORSE EXERCISE TOLERANCE AND LESSER QUALITY OF LIFE IN PATIENTS WITH ACS.	ID IS AN INDEPENDENT PREDICTOR OF DEATH AND DEVELOPMENT OF HEART FAILURE IN ACS PATIENTS	LOWER TSAT LEVELS ARE INDEPENDENTLY ASSOCIATED WITH AN INCREASED RISK OF LONG-TERM MORTALITY.	IRON DEFICIENCY IS STRONGLY ASSOCIATED WITH UNFAVOURABLE MEDIUM-TERM OUTCOMES, INDEPENDENTLY OF SYSTOLIC HEART FUNCTION, THE EXTENT OF MYOCARDIAL NECROSIS AND ANAEMIA.

## CURRENT PROGRESS

### Population characteristics

	ALL	WITHOUT ID	%	ID	%
N	27	19	70%	8	30%
MALE	19,00	15	79%	4	21%
AGE	66,92	67,42		65,75	
BMI (MEDIAN)	27,08	26,79		28,98	
HYPERTENSION	19	13	68%	6	32%
DIABETES	8	6	75%	2	25%
SMOKING	13	7	54%	6	46%
STEMI	12	8	67%	4	33%
EARLIER PCI	4	3	75%	1	25%
MULTIVESSEL DISEASE	18	12	67%	6	33%

## ID AND SURVIVAL PROBABILITY DURING FOLLOW-UP



T. Zeller et al., 'Adverse outcome prediction of iron deficiency in patients with acute coronary syndrome', Biomolecules, vol. 8, no. 3, Sep. 2018, doi: 10.3390/biom8030060.

## ACCOMPLISHMENTS



- Local Bioethics Committee approval
- Case presentation during "Wrocław Cardiology Forum"
- Case presentation during "PoEcho 2024 Conference"
- Pending Approval of Review Article "Iron deficiency as a possible important factor in patients with myocardial infarction – state of the art"

## REFERENCES

- [1] Unspecified, 'WHO Factsheet on Cardiovascular Diseases'.
- [2] S. R. Pasricha, J. Tye-Din, M. U. Muckenthaler, and D. W. Swinkels, 'Iron deficiency', The Lancet, vol. 397, no. 10270, Lancet Publishing Group, pp. 233-248, Jan. 16, 2021, doi: 10.1016/S0140-6736(20)32594-0.
- [3] N. Cosentino et al., 'Iron deficiency in patients with ST-segment elevation myocardial infarction undergoing primary percutaneous coronary intervention', Int J Cardiol, vol. 300, pp. 14-19, Feb. 2020, doi: 10.1016/j.ijcard.2019.07.083.
- [4] O. Merono et al., 'Iron Deficiency Is a Determinant of Functional Capacity and Health-related Quality of Life 30 Days After an Acute Coronary Syndrome', Revista Española de Cardiología (English Edition), vol. 70, no. 5, pp. 363-370, May 2017, doi: 10.1016/j.rec.2016.10.004.
- [5] C. Silva et al., 'Prognostic impact of iron deficiency in acute coronary syndromes', Revista Portuguesa de Cardiologia (English Edition), vol. 40, no. 8, pp. 525-536, Aug. 2021, doi: 10.1016/j.rpece.2020.09.005.
- [6] J. González-D'Gregorio et al., 'Iron deficiency and long-term mortality in elderly patients with acute coronary syndrome', Biomark Med, vol. 12, no. 9, pp. 987-999, Sep. 2018, doi: 10.2217/bmm-2018-0021.
- [7] T. Zeller et al., 'Adverse outcome prediction of iron deficiency in patients with acute coronary syndrome', Biomolecules, vol. 8, no. 3, Sep. 2018, doi: 10.3390/biom8030060.

## ABBREVIATIONS

ACS - acute coronary syndrome | AMI - acute myocardial infarction | ID - iron deficiency | TSAT - transferrin saturation | FER - ferritin concentration | IQR - interquartile range | QoL - quality of life