Mortality of patients with implanted pacemaker: Long-term follow-up Data from Czech National Pacemaker Registry (REPACE)

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Aim: The aim is the long-term continuous monitoring of patients with an implanted pacemaker (PM) regarding real mortality and morbidity in relation to the standard population without PM, to predict the development of procedures and costs of care in the next ten years.

Methodology: The analysis is based on data, which are collected within the framework of the National Health Information System and national health registers. The National Register of Reimbursed Health Services – contains data from health insurance companies in both inpatient and outpatient areas, including complete data on reported diagnoses, procedures, treatment and rehospitalizations.

Results: The analysis is performed on a population sample of 82,791 patients who underwent PM implantation for symptomatic bradycardia with standard indications according to the guidelines. The annual number of PM implantations is steadily increasing slightly (in the years 2010-2019 by an average of 120 cases per year). In 2020, there was a year-on-year decrease of 6%, in connection with the COVID-19 pandemic, increased mortality and the limitation of care provided. The annual share of reimplantations in the total number of performed procedures varies between 24% and 30%. In the years 2010-2021, almost 114 thousand pacemakers were implanted, of which 27.9% were single-chamber, 67.4% were double-chamber, and 4.6% were biventricular. A higher proportion of pacemakers are implanted in men (56.9% vs. 43.1% in women). This share is increasing over time: in 2010, the share of men was 55.3%, in 2021 it will be 57.8%. The average age of a patient at the time of initial pacemaker implantation is 76 years (75 years for men, 77 years for women). From 2010 to 2021, the average age of patients at primary implantation increased by 1 year from 75.3 years to 76.3 years. Patients with primary PM implantation in the years 2010–2021 (N = 82,791) according to the age of the patient at the time of the procedure - the length of survival is evaluated using the Kaplan-Meier method. The patient is monitord from the date of PM primoimplantation until the date of death (Fig. 1).

Conclusions: Relative survival expresses the rate of survival of patients with an implanted pacemaker compared to the general population. 5-year relative survival is 88.6% (overall survival: 60.6%), 10-year relative survival is 75.9% (overall survival: 32.7%). (Fig.2) The most common cause of death in people with implanted PM are diseases of the circulatory system (62% of death cases; of which 31% dg. I25 chronic CAD, 6% dg. I50 heart failure, 4% dg. I21 acute MI). This is followed by oncological diseases (13%) and diseases of the respiratory system (7%). The average age of the deceased is 83 ± 8 years. Causes of death vary according to the patient's age at death; with age, the proportion of deaths from diseases of the circulatory system increases, while the proportion of deaths from oncological diseases decreases.
Overall survival of patients after PM primary implantation by age

Patients with primary PM implantation in 2010–2021 (N = 82,791) according to the age of the patient at the time of the procedure. The length of survival is evaluated using the Kaplan-Meier method. The patient is monitored from the date of PM primoimplantation until the date of death.

5-year and 10-year relative survival of patients after primary PM implantation

Patients with primary PM implantation in 2010–2021 (N = 82,791):
The relative survival estimate is determined by the Pohar-Perme method; observed survival was determined by the Kaplan-Meier method, expected survival based on mortality tables for the Czech population.

5-year and 10-year relative survival