

Impact of COVID-19 pandemics upon nationwide pulmonary hypertension cohort: 18-months analysis of BNP-PL national database

A. Mamzer¹, J.D. Kasprzak¹, M. Waligora², M. Kurzyna³, E. Mroczek⁴, T. Mularek-Kubzdela⁵, P. Pruszczyk⁶, E. Lewicka⁷, D. Karasek⁸, B. Kusmierczyk-Droszcz⁹, K. Mizia-Stec¹⁰, K. Ptaszynska-Kopczynska¹¹, I. Skoczylas¹², P. Blaszczyk¹³, G. Kopec²

¹Bieganski Hospital, 1st Department and Chair of Cardiology, Medical University of Lodz, Lodz, Poland; ²Jagiellonian University Medical College, Department of Cardiac and Vascular Diseases, Krakow, Poland; ³European Health Center, Cardiology Department, Otwock, Poland; ⁴Wroclaw Medical University, Department of Cardiology, Wroclaw, Poland; ⁵Poznan University of Medical Sciences, Cardiology Department, Poznan, Poland; ⁶Medical University of Warsaw, Department of Internal Medicine and Cardiology, Warsaw, Poland; ⁷Medical University of Gdansk, Department of Cardiology and Electrotherapy, Gdansk, Poland; ⁸Nicolaus Copernicus University, 2nd Department of Cardiology, Faculty of Health Sciences, Bydgoszcz, Poland; ⁹Institute of Cardiology, Department of Congenital Heart Disease, Warsaw, Poland; ¹⁰School of Medicine in Katowice, Medical University of Silesia, 1st Department of Cardiology, Katowice, Poland; ¹¹Medical University of Bialystok, Department of Cardiology, Bialystok, Poland; ¹²The Medical University of Silesia, 3rd Department of Cardiology, Zabrze, Poland; ¹³Cardinal Wyszynski Hospital, Department of Cardiology, Lublin, Poland

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Introduction: Pulmonary hypertension (PH) patients may be vulnerable to SARS-CoV-2 infection, but large analytic studies on morbidity and mortality risks are limited.

Aim: Assessment of the incidence and course of COVID-19 among patients (pts) diagnosed with PH, treated under the NFZ program, registered in the national BNP-PL database with the assessment of the impact of the SARS-CoV-2 pandemic on the care of patients with pulmonary hypertension in Poland.

Methods: We analyzed the records of the complete population of Polish pts treated under the National Drug Program of PH (PAH and CTEPH), registered in the national database of BNP-PL, and updated on an ongoing basis by all PH centers. The frequency of SARS-CoV-2 infections, clinical severity of COVID-19 course and mortality were reviewed. Clinical characteristics of infected and deceased patients were compared to the remaining patients registered in the BNP-PL database. The rate of increase of new diagnoses ended with inclusion in the Drug Program between 01 March 2020 and 31 August 2021, compared to the pre-pandemic year 2019, and the change in the treatment profile were reviewed.

Results: The analysis included 1923 pts (PAH 1292, CTEPH 631). The incidence of SARS-CoV-2 infections was 7.4% (n=143) and similar to general population (7.6%), with a slight preponderance in PAH 8.1% (n=105) vs. CTEPH 6.0% (n=38) (p=0.099). 47 patients (33%) required hospital-

ization. Mortality rate was 24% (34/143) vs. 2.6% for general population – including 19/34 outside of hospital. Those who died due to COVID-19 were older (mean age 56±17.6 vs. 70.5±12.8 yrs; p<0.0001) and had more cardiovascular comorbidities (1.35 vs. 1.97; p=0.01). Systemic arterial hypertension was the strongest unique risk factor for mortality, present in 71% decedents vs. 45% of survivors, and the only independent risk factor in multivariate logistic regression analysis (OR 2.94, 95% CI 1.28–6.73). Moreover, there was a trend towards a higher incidence of diabetes and coronary artery disease in the group of non-survivors (Table 1). The number of new diagnoses of PH decreased during the pandemic compared to 2019 (new diagnoses rate in 2019 was 28.2/month vs. 19.2/month during COVID). A significant increase in total mortality was also observed in the PH group (11.1/month in 2019 vs. 13.7/month during COVID). Escalation of specific PH therapy also reduced (rate of specific therapy escalation in 2019 was 30.4/month vs. 20.5/month during COVID).

Conclusions: The COVID-19 pandemic has deeply affected the care of patients with pulmonary hypertension by reducing the number of new diagnoses, escalation of therapy, and increasing overall mortality in this population, and this impact continues into second year of pandemics. Pulmonary hypertension is associated with a more severe course and higher mortality in COVID-19.

Table 1. Characteristics of patients with PH (PAH and CTEPH) and COVID-19.

	Survivors (n=109)	Non-survivors (n=34)	p-value
Age (yrs)	56±17.6	70,5±12.8	<0,0001
Female (% , n)	62% (68)	56% (19)	0.55
WHO-FC	2.4±0.66	2.8±0.76	0.59
Arterial Hypertension (n, %)	49 (45%)	24 (71%)	0.01
Diabetes (n, %)	20 (18%)	11 (32%)	0.09
Coronary artery disease (n, %)	11 (10%)	8 (24%)	0.08
Hypothyroidism (n, %)	18 (17%)	10 (29%)	0.14
Comorbidity score	0.9±0.89 (median 1)	1.53±1.13 (median 1,5)	0.003

Comorbidity included the number of individual comorbidities: arterial hypertension, diabetes, coronary artery disease, hypothyroidism.
WHO-FC= The World Health Organization Functional Class;