

## **Clinical Outcome of COVID-19 in Adults with Congenital Heart Disease in Europe (COVID-19 Tracker) – An Initiative of the European Collaboration for Prospective Outcome Research in Congenital Heart Disease (EPOCH)**

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**Introduction:** Patients with acquired cardiovascular disease are considered to be at risk in case of coronavirus disease 2019 (COVID-19). However, outcomes among adults with congenital heart disease (ACHD) have not yet been studied.

**Methods:** We collected COVID-19 cases among ACHD patients followed at 27 tertiary care centers in 10 European countries between March 27, 2020 and January 25, 2021. Patient characteristics including heart defect complexity, past medical history, residual cardiac defect-related problems and COVID-19 course were recorded. Cases were stratified according to the course of the disease in mild (not requiring hospitalization), moderate (requiring hospitalization but not ventilation) and severe (requiring ventilation or cardiovascular support, or death). Data were reported as median (interquartile range) and counts (percentage).

**Results:** 377 resolved cases were included in the analysis (median age 35 [25-44] years, 54% female; see Figure). The course of the disease was mild for 307 (81%), moderate for 46 (12%), and severe for 24 (6%) patients. Eleven Patients (3%) died. Between disease severity groups, there were no significant differences related to gender. Patients with a moderate or severe clinical course were significantly older (33 [25-42], 44 [34-55] and 48 [36-53] years for mild, moderate and severe, respectively), had more often  $\geq 2$  comorbidities and their body mass index (BMI) was often  $>25$  kg/m<sup>2</sup> ( $p < 0.001$  for all). ACHD patients with a complex defect were overrepresented among cases with moderate and severe COVID-19 course. Patients with no defect-related problems were more likely to have a mild clinical course. Those with heart failure, valvar or arrhythmia problems were more evenly distributed among the three subgroups, while almost two-thirds of the patients with pulmonary hypertension had moderate or severe clinical course.

**Conclusion:** In ACHD patients, clinical COVID-19 course differs in relation to age, BMI  $>25$  kg/m<sup>2</sup>, number of comorbidities, defect complexity and residual pulmonary hypertension.

**Key words:** COVID-19, adult congenital heart disease, outcome

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### Abstract EuroGUCH 2021

COVID-19 Tracker is an initiative of EPOCH ([www.sacher-registry.com/epoch](http://www.sacher-registry.com/epoch)). It reports characteristics and outcomes of cases with confirmed or suspected SARS-CoV-2 infections among adults with congenital heart disease (ACHD) from 26 tertiary care centers across Europe.

<i>n = 377 patients</i>	<b>Mild (n= 307)</b>	<b>Moderate (n=46)</b>	<b>Severe (n=24)</b>	<b>p</b>
<b>Female gender (%)</b>	171 (56)	22 (48)	10 (42)	<b>0.3</b>
<b>Age (years)</b>	33 (25-42)	44 (34-55)	48 (36-53)	<b>&lt;0.001</b>
<b>BMI &gt;25 kg/m<sup>2</sup></b>	86 (38)	23 (50)	15 (65)	<b>&lt;0.001</b>
<b>≥ 2 comorbidities (yes)</b>	24 (8)	12 (26)	8 (33)	<b>&lt;0.001</b>
<b>Cardiac defect complexity</b>				<b>0.04</b>
mild	111 (85)	12 (9)	8 (6)	
Moderate	119 (86)	15 (11)	5 (3)	
severe	77 (72)*	19 (18)	11 (10)	
<b>Defect related problems</b>				<b>&lt;0.001</b>
no problems	129 (88)	13 (9)	5 (3)	
mainly valvular problem	116 (88)	11 (8)	5 (4)	
mainly heart failure	20 (63)	9 (28)	3 (9)	
mainly arrhythmia problems	34 (74)	8 (17)	4 (9)	
pulmonary hypertension	8 (40)*	5 (25)	7 (35)*	

Data are median (interquartile range) or number (percentage). BMI= body mass index (in kg/m<sup>2</sup>)

\*Cells significantly differing from the projected proportions of the null hypothesis (adjusted p-value of 0.003 for severe/mild and <0.00001 for pulmonary hypertension/mild and pulmonary hypertension/severe). Adjusted p-value were calculated in post-hoc testing from their correspondent standardized residuals.