Table S1. Articles on COVID-19 infection with more than 50 CHD patients

Authors, Country	Study design	N	N adults age ≥18 years	Suspected COVID	Confirmed COVID+	Age (years) Sex	Definition of moderate/severe infection	Moderate/severe infection	Death	Mild disease (Not hospitalized)	Hospitalized	Hospitalized with ventilation, inotropic support	CV complication	Current medications	Comorbidities associated with severe infection (OR; p value)
Mohammadzadeh et al, Iran(1)	Single centre telephone survey All CHD patients age ≥14 years with ≥1 visit during last year at private office or study hospital	309	Unknown	Confirmed COVID+ defined as: PCR+ and/or CT findings Confirmed COVID+: 18 (6%) Unknown status: 291 (94%) ≥1 symptom: 37 (12%) Asymptomatic: 272 (88%) COVID+ or ≥1 symptom: 38 (12%) 1 patient was asymptomatic but diagnosed COVID+ due to COVID+ household contact		Age: 14-72 Mean: 29 Sex: M=45%	Death or hospitalization	3/38 (8%)	1/18 COVID+ Decompensated after TVR for Ebstein anomaly. ICU roommate subsequently tested COVID+.	35/37 (95%) symptomatic 17/18 COVID+	2/37 symptomatic patients were hospitalized. No further details.		Unknown	Yes including ACE inhibitors	**Univariate analysis independent variables**: Status post Fontan, PH, Eisenmenger syndrome, reduced EF, diuretic use, age ≥30 **COVID+ (N=18) versus unknown status (N=291)**: Diuretic use (6/18) (p=0.023) Age ≥30 years (15/18) (p<0.001) **Symptomatic (N=37) versus asymptomatic (N=272):** Diuretic use (14/37) (p<0.001) Age ≥30 (24/37) (p=0.003)
Sabatino et al, Italy(2)	Cross-sectional survey of 8 high volume centres	76	72	66 adults (92%) 1 child (25%) Defined as symptoms and history of exposure	6 adults (8%) 3 children (75%) Defined as ≥2 PCR+ tests	72 adults: Age: 21-76 Mean: 36 Sex: M=53% 4 children: Age: 2 months to 2 years Sex: M=50%	Any CV complication*	7/76 (10%) 4/72 adults (6%) 3/4 children (75%)	0/76 (0%)	67/67 suspected COVID (88% of 76) 66/72 adults (92%) 1/4 children (25%)	9/9 COVID+ (12% of 76) Presumably all COVID+ patients were monitored in hospital for potential CV complications 6/72 adults (8%) 3/4 children (75%)	^1 adult: HF requiring ECMO support Adults or children: 1/9: Inotropic support 1/9: CPAP	Adults: 2/6: None 1/6: Chest pain ^1/6: HF, stroke, arrhythmia 1/6: HF 1/6: Stroke, arrhythmia Children: 1/3: HF, myocardial injury, pericardial effusion 2/3: HF, PH	Not assessed	Not assessed
Lewis et al, USA(3)	Retrospective single centre chart review	53	43	43 adults (100%) 10 children (100%) Unclear how many were confirmed versus suspected COVID-19 infection. 1 patient was asymptomatic. Suspected infection: Symptoms consistent with COVID-19 infection with a positive household or roommate contact. Confirmed COVID+: PCR+		Cohort: Median: 34 (IQR 16) Sex: M=58% Adults: Median: 37 (IQR 21) Sex: M=56% Children: Median: 3 (IQR 9) Sex: M=70%	Any of: Death, Hospitalization, or Need for new or increased respiratory support	9/53 (17%) 7/43 adults (16%) 2/10 children (2%)	3/53 (6%) 3/43 adults (7%) 1/3 at long term care facility 2/3 in ICU 0/10 children (0%)	44/53 (83%) 36/43 adults (84%) 8/10 children (80%)	7/53 (13%) 5/43 adults (12%) 2/10 children (20%) 2/43 (22%) remained at home or long-term care facility with increased supplemental oxygen 1/2 recovered 1/2 died	2/5 adults required supplemental oxygen 3/5 intubated 2/3 died 1/3 recovered 1/2 children required inotropic support, supplemental oxygens	Troponin: Adults: 4/7: No data 2/7: Normal 1/7: Elevated Children: 2/2: Normal	Yes, including ACE inhibitors	**Not significant:** Single ventricle/Fontan (OR 0.49; p=0.91) **Complex congenital anatomy (OR 2.86, p=0.36) Decreased ventricular function (OR 1.51, p=0.81) **Unadjusted univariate analysis:** PH (mPAP≥25 mmHg) (OR 15.25, p=0.011) Obesity (BMI≥30 kg/m^2) (OR 7.34, p=0.046) **Adjusted for multiple testing:** Genetic syndrome (OR 35.82; p=0.0002) ACHD physiologic stage C or D (OR 19.38; p=0.0020)
Schwerzmann et al, Europe(4)	Prospective cohort 25 centres, 9 countries	105	Unknown	27 (26%) Defined as symptoms and characteristic findings on CT chest	78 (74%) Defined as positive test by PCR or ELISA	Age: 16-75 Mean: 38 Sex: M=42%	Any of: Death, or Hospitalization requiring invasive/non-invasive ventilation or inotropic support (including ECMO)	13/105 (12%) 9/105 (9%) ongoing cases	5/105 (5%) 1/5 died after surgery for BAV with severe stenosis with decompensated HF 2/5 died in hospital 2/5 chose palliative care #1/2 discharged from ED 1/2 to palliative care	73/105 (70%)	31/105 (30%) #1 patient was discharged home from ED for palliative care	11/31 (10%) 3/11 died 3/11 ongoing 5/11 recovered	Not assessed	Not assessed	**Univariate analysis:** Age, per 5 years (OR 1.3; p=0.018) Residual cardiac defect (p=0.089) Cardiac complexity (p=0.423) **Multivariate analysis:** Cyanotic heart disease (OR 60.0; p>0.001) BMI >25 kg/m^2 (OR 16.4; 0=0.001) ***≥2 comorbidities (OR 6.7; 0.027)

Articles with fewer than 50 patients, or only pediatric patients or Down syndrome patients were included.
*CV (cardiovascular) complication: Any of: palpitation/arrhythmia, chest pain, myocardial injury (troponin T above 99th percentile upper reference limit, heart failure, stroke/transient ischaemic attack (TIA), pulmonary hypertension, pericardial effusion, or respiratory failure.
**Complex congenital anatomy: Any of: Unrepaired or palliated cyanotic heart defect; status post Fontan procedure; single ventricle physiology; pulmonary atresia; transposition of the great arteries; truncus arteriosus; or abnormalities of the atrioventricular or ventriculoarterial connection.
***Comorbidities: Arterial hypertension, diabetes, atherosclerotic disease (stroke or coronary artery disease), obstructive lung disease, immunocompromised, cancer, liver disease/cirrhosis or renal failure.
#Same patient. ^Same patient.
Abbreviations:
IQR interquartile range. OR odds ratio. N number of patients.
Suspected COVID-19-infection: Infection diagnosis based on symptoms consistent with COVID-19 infection and other clinical feature(s).
COVID+: Confirmed infection by polymerase chain reaction (PCR) test and/or other test (see table).
ACHD adult congenital heart disease. BAV bicuspid aortic valve. BMI body mass index. CHD congenital heart disease. CPAP continue positive airway pressure. CT chest thoracic computed tomographic imaging. ED Emergency department.
ECMO extracorporeal membrane oxygenation. ICU intensive care unit. ELISA enzyme-linked immunosorbent assay. HF heart failure. mPAP mean pulmonary artery pressure in mmHg. PH pulmonary hypertension. TIA transient ischaemic attack. TVR tricuspid valve replacement. USA United States of America.

References

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3. Lewis MJ, Anderson BR, Fremed M, et al. Impact of Coronavirus Disease 2019 (COVID-19) on Patients With Congenital Heart Disease Across the Lifespan: The Experience of an Academic Congenital Heart Disease Centre in New York City. *J Am Heart Assoc* 2020;9:e017580.
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