COVID-19, cardiomyopathies and myocarditis

**Prof. Philippe Charron** (Sorbonne University and Pitié-Salpêtrière Hospital, Paris, France): Introduction

**Prof. Perry Elliott** (University College London and St. Bartholomew’s Hospital, London, UK): Cardiomyopathies

**Prof Alida LP Caforio** (University of Padova and Azienda Ospedaliera di Padova, Padova, Italy): Myocarditis

Webinar series, Covid-19 clinicians network

07th May 2020
COVID-19, cardiomyopathies and myocarditis

Introduction

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Covid-19 (\textit{SARS-CoV-2}) pandemic

Globally, as of 2:00am CEST, 6 May 2020, there have been 3,588,773 confirmed cases of COVID-19, including 247,503 deaths, reported to WHO.

\url{https://covid19.who.int/}
Covid-19 & Heart (1)

- Patients with cardiovascular risk factors and/or established cardiovascular diseases represent a vulnerable population when suffering from COVID-19.

- A meta-analysis of 1527 patients that summarized the prevalence of cardiovascular metabolic diseases (CVMD) in COVID-19:
  - The proportions of hypertension, cardio-cerebrovascular disease and diabetes in patients with COVID-19 were 17.1%, 16.4% and 9.7%, respectively.
  - The incidences of hypertension, cardio-cerebrovascular diseases and diabetes were about twofolds, threefolds and twofolds, respectively, higher in ICU/severe cases than in their non-ICU/severe counterparts.

  *Li B et al. Clin Res Cardiol 2020*

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**Cardiomyopathies**
(dilated, hypertrophic, restrictive, right ventricular)

**Medical therapy**
(Bblocker, ACEi, sartan, anti-arrhythmic)

Alternatively, COVID-19 may induce cardiac injury (*myocardial damage and cardiac arrhythmia*) in some patients, that is associated with an increased risk of morbidity and mortality (*increased cardiac biomarkers are associated with significantly higher mortality*).

Cardiovascular causes of death in 150 hospitalized Covid-19 patients: 68 deaths including 22 pts (33%) from myocardial damage and respiratory failure, and 5 pts (7%) with myocardial damage and circulatory failure → include patients with fulminant myocarditis ++

Guo T et al. JAMA Cardiol 2020


Ruan Q et al. Intensive Care Med 2020 (online 03 March)
Cardio Vascular Diseases may be a primary phenomenon in COVID-19, but may be secondary to acute injury. Cytokine release storm (IL-6 release etc) as well as immune system activation may also contribute to CV Diseases.

Cardiomyopathies and myocarditis may represent an illustrative example of these complex relationships, since inflammation and immune system play an increasingly recognized role in cardiomyopathies through gene-environment interactions.

Cardiomyopathies (hereditary)  Myocarditis Inflammatory cardiomyopathy

https://www.escardio.org/Education/
From Guzik et al. Cardiovasc Res 2020

Caforio ALP et al. Circ 2020
Piriou N et al. ESC HF 2020
Ader F et al. Circ CVG 2020 in press
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