Medical Advice Disclaimer

• Information in this webinar is for your information.
• The content is not intended to be a substitute for professional medical advice, diagnosis, or treatment, and does not constitute medical or other professional advice.
• Medical information changes constantly. Information in this webinar could be updated or change.
• Please follow up with your doctor and medical team for specific recommendations pertaining to the treatment of you or your family.

April 15, 2020
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March 25, 2020
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Chief Medical Officer

Cat Davis Ahmed
VP, Policy and Outreach

April 15, 2020
Outline

• Risk Factors for COVID-19
• Types of Cardiac Involvement with COVID-19 Infection
• Familial Hypercholesterolemia:
  • Possible Increased Cardiac Risk with COVID-19 Infection
    • Known Coronary Artery Disease
    • Subclinical Coronary Artery Disease
    • Elevated Lp(a)
• How Can You Protect Yourself and Your Family?
  • Medications
  • Social Distancing, Hygiene
Risk Factors for Severe Disease: COVID-19

- Advanced Age
- Diabetes
- Hypertension
- Cardiac Disease
- Chronic kidney or lung disease
- Human immunodeficiency virus (HIV)
- History of an organ transplant
- Use of biologics that suppress the immune system

(IMPORTANTLY: THIS DOES NOT INCLUDE PCSK9i)
Cardiac Involvement in COVID-19

**RISK FACTORS**

- PRIOR CVD
- IMMUNE ACTIVATION
- SHOCK
- METABOLIC DISARRAY
- COAGULOPATHY
- IMMOBILITY

**CARDIOVASCULAR COMPLICATIONS**

- ARRHYTHMIA
- MYOCARDITIS
- ACUTE CORONARY SYNDROME
- VENOUS THROMBOEMBOLISM
- CARDIOGENIC SHOCK
- HEART FAILURE
Types of Cardiac Involvement with COVID-19 Infection

- Infection with COVID-19 has been associated with multiple cardiac complications:
  - Heart Attack
  - Myocarditis
  - Heart Rhythm Disturbances
  - Blood Clots
- Some of the medications being used as potential treatments for COVID-19 can have cardiac side effects.

Types of Cardiac Involvement with COVID-19 Infection

• Increased Risk of Heart Attack: Multiple potential mechanisms including:
  • Hypoxia: due to respiratory / lung compromise. Decreased oxygen to the heart can lead to a heart dysfunction and a heart attack
  • Severe systemic inflammation can lead to unstable plaque and subsequent and plaque rupture
  • COVID-19 can also masquerade as a heart attack – elevated troponins, EKG changes and chest pain
  • Although it is too early to say, other viruses (such as influenza) put people at risk for post viral heart attacks – so should follow survivors closely in recovery

Types of Cardiac Involvement with COVID-19 Infection

- Myocarditis (inflammation of the heart muscle)
  - In the setting of a very high viral load can see inflammatory cells infiltrating the heart muscle and potentially weakening the tissue leading to heart failure.
  - The virus can cause wide-spread systemic inflammation “cytokine storm” can lead to inflammation of the heart muscle.

Types of Cardiac Involvement with COVID-19 Infection

- Heart Rhythm Disturbances may be the result of:
  - Hypoxia (lack of oxygen)
  - Metabolic / electrolyte abnormalities
  - Widespread systemic inflammation
  - And even secondary to some of the medications being used for treatment including: lopinavir/ritonavir, chloroquine

Types of Cardiac Involvement with COVID-19 Infection

• Blood Clots:
  • Appears that COVID-19 patients are also at risk for venous thromboembolisms (blood clots that originate in the veins but can travel to the heart or lungs)
  • There are reports of abnormalities in coagulation (blood clotting) parameters
  • Vascular inflammation can contribute to being hyper-coagulable

Types of Cardiac Involvement with COVID-19 Infection

- Some of the medications being used as potential treatments for COVID-19 can have cardiac side effects.
  - lopinavir/ritonavir: prolonged QT
  - Chloroquine: arrhythmias, cardiomyopathies
  - Bevacizumab: direct myocardial toxicity, hypertension, coagulation
  - Interferon: direct myocardial toxicity, possible arrhythmias
  - Methylprednisolone: electrolyte disturbances, hypertension

Does Having FH Make A Person More Vulnerable?

• Just having FH should not make you more vulnerable.
  • However people with FH who were diagnosed as adults or have not been adequately treated may have “subclinical atherosclerosis” and may be at increased risk

• If you have FH and underlying heart disease or other risk factors, you are likely at increased risk

• Having an elevated Lipoprotein (a) and FH may increase risk
Lipoprotein (a)
What is Lipoprotein (a)?

Lp(a) is an LDL-like particle with an attached protein called apolipoprotein(a). Just like LDL, Lp(a) can clog arteries. Apolipoprotein (a) adds an additional, negative risk – an increased risk for clotting. The combination of clogging arteries and clotting increases the risk for heart attacks even under the best of circumstances but in the setting of infection with COVID-19 this risk may be higher.

Why would infection with COVID-19 make the risk for someone with elevated Lp(a) greater?

Infection with COVID-19 may trigger intense systemic inflammation. One of the many inflammatory proteins that increases in response to infection with this virus is interleukin 6. This protein can lead to increases in already elevated Lp(a) levels and potentially increase the risk of a heart attack.
FH, Elevated Lp(a) and COVID-19

• How can you lower Lp(a)?

• Dr. Patrick Moriarty of the University of Kansas Medical Center has pointed out that Lipoprotein Apheresis not only lowers LDL and Lp(a), but also lowers a host of inflammatory proteins (including interleukin 6, interleukin 1, and TNF alpha) as well

• In fact, the FDA has just approved emergency use of apheresis in very unstable patients with COVID-19
April 3, 2020

UCSD Lp(a) Clinic

To whom it may concern:

In response to patient and health care provider queries, please see the following summary of a high risk population that may need special protection against COVID-19.

With the current ongoing epidemic, a particularly high risk population is patients with elevated Lp(a), particularly if it is in conjunction with cardiovascular disease. Reports are emerging that a significant proportion of patients infected with COVID-19 develop atherothrombotic complications. Lp(a) is a lipoprotein that is associated with both cardiovascular disease and thrombosis. Additionally, Lp(a) levels may rise substantially (>100%) in response to IL-6 levels. The cytokine storm accompanying COVID-19 is manifested by increased IL-6 levels, which may further increase Lp(a) and lead to additional cardiovascular complications and even poorer prognosis.

I would recommend such patients and health care workers be placed in the least exposed situations to avoid complications in the event a COVID-19 infection occurs.

For patients undergoing apheresis for elevated Lp(a), please continue your therapy as recommended by your physician. Apheresis lowers both Lp(a) and IL-6, and stopping apheresis could lead to cardiovascular events, therefore the net benefit is to continue treatments.

Sincerely,

S. Tsimikas

Satiny Tsimikas, M.D.
Professor of Clinical Medicine
Director of Vascular Medicine, Division of Cardiology
University of California San Diego, School of Medicine

Available to print from our website at: www.theFHfoundation.org/Lpa-and-COVID19
Potential Special Concerns /Considerations for People with FH

• Can we learn anything from other bacterial/viral pulmonary infections?
  • Persons with FH who have been infected with Chlamydia Pneumonia (a common bacterial cause of community pneumonia) have an increase risk of subsequent cardiac events – unknown if persons with FH will have a similar increase risk after COVID-19

• The Atherosclerosis Risk in Communities (ARIC) study found a link between cytomegalovirus antibodies (a herpes virus) and atherosclerosis in persons with elevated lipoprotein(a). Persons with FH tend to have higher lipoprotein (a). It is unknown if there will be similar findings following COVID-19 infection in people with FH & elevated Lp(a).

Recommendations from FH Specialists

- If you have FH, make sure you take all your cholesterol lowering and other medications without interruption.
  - ACE/ARBs for blood pressure
  - Statins, ezetimibe, PCSK9i, bempedoic acid, bile acid sequestrants for LDL lowering
  - Lipoprotein Apheresis

- Keep up with your FH care. Consider making a telemedicine appointment with your healthcare provider if it is time for your next appointment.

- Following an infection, your health care provider may decide to intensify your lipid lowering treatments.

- Follow government recommendations (CDC), wash your hands frequently and practice social distancing.

*Personal communication: Alpo Vuorio, Gerald Watts & Petri Kovanen*
COVID-19 + FH: What you need to know
Discusses FH Treatments and COVID-19 Risk for People with FH

Available to watch on our website: www.theFHfoundation.org/Webinars
Don’t ignore heart attack symptoms…

**CORONAVIRUS AND YOUR HEART**

Most of us are worried about the new coronavirus. **DON’T IGNORE HEART SYMPTOMS, ESPECIALLY IF YOU HAVE A HEART CONDITION.**

**GETTING CARE IS CRITICAL**

You’ll get better faster. You’ll limit damage to your health.

**HEART ATTACK**
- Chest pain
- Difficulty breathing
- Discomfort in chest, arms, back, neck, shoulder or jaw

**STROKE**
- Numbness, weakness or loss of movement in your face, leg or arm, especially on one side
- Confusion, trouble speaking or understanding
- Loss of balance

**CALL 911**

If you think you are having a HEART ATTACK or STROKE.

Heart attacks and strokes don’t stop during a pandemic.

Hospitals have safety measures to protect you from infection.

**CALL YOUR DOCTOR** if you have a heart condition and have questions or think you need a health visit.

**DON’T DELAY** routine care. You may be able to get advice over the telephone or use telehealth for a virtual visit.
The FH Foundation Is Here to Help

• Join an online discussion group through Facebook
  • [https://thefhfoundation.org/get-involved/support-groups](https://thefhfoundation.org/get-involved/support-groups)

• Share stories and ideas through social media - #KnowFH

• Email us at [info@thefhfoundation.org](mailto:info@thefhfoundation.org) with your questions.

• Visit our website: [www.thefhfoundation.org](http://www.thefhfoundation.org)
QUESTIONS?