Oxygen (supplement) may decrease death in COVID-19 patients

4/16/2020

Ethiopian Diaspora High-Level Advisory Council on the COVID-19 Pandemic in Ethiopia

Background: About 20% of patients with covid-19 may require supplemental oxygen to breath and survive. It is terrifying to patients when they say "I can't breathe". It is also at the same time tormenting to health care providers that are close to the patient and do nothing; this could be the reality in Ethiopia.

Why supplemental oxygen?
Supplemental oxygen decreases death rate, and may decrease the need for mechanical ventilation (which is non-existent or may be dangerous because of power interruption in Ethiopia). At the same time, supplemental oxygen reassures patients and health care providers that help is in on the way (a sense of security) and gives more time for other measures to take effect; antibiotics to treat concomitant infection, diuretics to alleviate flooded lung form congestive heart failure.

COVID19 infection is primarily pneumonia, and the most common cause of death is inadequate oxygen supply to the body. Early and appropriate administration of oxygen support by frontline providers can prevent worsening to severe disease. With limitations in ICU and ventilator care, having a strategy for early rescue of patients by frontline providers by administering oxygen will assist in the allocation of scarce tertiary resources to those who are refractory to initial therapy.

Unfortunately oxygen, though it is free in the air, it needs to be concentrated. This requires a gadget called "**oxygen concentrator'**. Except few, all hospitals in Ethiopia do not have in-house oxygen delivery system. They use oxygen tanks. There may be a need to have more purchases of **oxygen tanks.** In addition, Covid-19 patients most likely will be in make shift hospitals or warehouses with poor electricity, poor sanitation, and most likely will be poorly staffed. Despite those challenges, oxygen tanks and concentrators must be available as this may be a question of life and death. Once it is available it is very easy to use, it is as simple as turning a key.

Each oxygen tanker needs to come with **nasal cannula** (a lightweight plastic tube with two prongs), **venturi mask or non-rebreather mask** (both deliver higher levels of oxygen). It may be reasonable to talk to locally available plastic manufacturers, in case they have any capacity, as "necessity is the mother of invention".

Since most may be anxious and feel short of breath, we need to have ways of identifying the level of oxygen in the body. **Pulse ox** (pulse oximeter) is a clump like electronic device placed on finger, ear lobe or toe and measures the amount of oxygen in the blood. It can be battery driven, portable and it requires only ability to read numbers.

The advisory committee recommends that:

- Preparation to secure the above instruments ***(oxygen concentrators, oxygen tanks, nasal cannula, venturi mask, non-rebreather mask and a finger pulse ox device and other mentioned below)*** should be secured during this window of opportunity, to be ahead of the lethal effect of the coivid-19, ***Time is of the essence!***

Materials needed for appropriate treatment of oxygen supplement:

I) Less demand (less need for experts, no need of power supply) and more benefit:

1. Oxygen concentrator (Durable)
2. Oxygen tanks (Durable)
3. Pulse ox (Pulse oximeter) (Semi-durable)
4. Nasal cannula (disposable
5. Venturi-mask (disposable unless sanitize and disinfected)
6. Non-rebreather mask (disposable unless sanitize and disinfected)
7. Medical oxygen regulator
8. CPAP Helmets /NIPPV Helmets
9. High Flow Nasal Cannula (HFNC)

II) High Demand (Experts, constant power upply) and less benefit:

1. Oxygen manufacturing capacity (know their potential)
2. Mechanical Ventilator (Durable)
3. CPAP or BIPAP Machines
4. Laryngoscope
5. Video laryngoscope
6. Viral Filters /HEPA Filters for Ventilator Tubing
7. Intubation Sets:

NB:

1. Most of them are durable and can be used for decades after the pandemic. We are certain that there are patients who need them now but not available or extremely expensive.
2. System needs to be established to trace those durable materials from theft and maldistribution. Ideally should have some kind of barcode with the name of the donor or organization on them.
3. Some of them can potentially be manufactured at home in the country. This should be strongly encouraged for several reasons.

Please see attached table for the details of oxygen supplement protocols.