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EDITORIAL

Guest Editorial:

Corona Virus (COVID -19): Handwashing as a protective Public Health Control Measure

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Introduction

The Covid-19 pandemic started in Wuhan city in China in December 2019 and gradually spread to the rest of the world. Kenya is one of the East African countries affected. The Corona virus causes a respiratory disease known as Covid-19. [1]

The purpose of this work was to describe handwashing as one of the Public Health preventive measures prescribed [1,2] to control infection by Covid-19.

Covid-19

Coronavirus virions are spherical with diameters of approximately 125 nm as depicted in recent studies by cryo-electron tomography and cryo-electron microscopy [3,4,5]. The most prominent feature of coronaviruses is the club-shaped spike projections emanating from the surface of the virion. These spikes are a defining feature of the virion and give them the appearance of a solar corona, prompting the name, coronaviruses. Within the envelope of the virion is the nucleocapsid. Coronaviruses have helically symmetrical nucleocapsids, which is uncommon among positive-sense RNA viruses, but far more common for negative-sense RNA viruses.[3]

Coronavirus A59 or SARs-Cov-2 including the Covid-19 is a virus causing respiratory infection that is currently spreading the world over and contains three structural proteins. The location of these proteins in relation to the viral envelope and RNA are clearly illustrated in the model shown elsewhere [6]. A nucleocapsid protein, N, (mw $\simeq$ 50k) forms the nucleocapsid together with the RNA genome. Surrounding the nucleocapsid is a lipoprotein membrane which contains the envelope glycoproteins El (mw $\simeq$ 23k) and E2 (mw $\simeq$180k and 90k). El is an integral membrane protein, the bulk of which lies within the viral membrane and probably spans the lipid bilayer. E2 is a peripheral glycoprotein which forms the characteristic peplomers that are associated with this virion [6].

Covid -19, the latest virus currently spreading all over the world, has virus particles that have spiked proteins sticking out from their surfaces and these spikes hook onto cell membranes allowing the virus's genetic material to enter the human cell. That genetic material proceeds to hijack the metabolism of the cell to disrupt the normal functioning of the cell.[6]

Handwashing

Handwashing remains the No. 1 tip for preventing the spread of Coronavirus (COVID-19). It is common sense and it works. However, it must be done properly and with soap and water. When soap and water are not available, the next best option is to use an alcohol-based hand sanitizer [7, 8]

Handwashing is an old public health measure used to protect against germs. This could be bacterial in nature or viral. The procedure involves washing hands using foam from soap under running tap water. The fingers should be rubbed thoroughly as well as the outer and inner surfaces of both hands. This should be done for a period of at least 20 seconds for effective protection. The hands are then dried thoroughly using a clean dry towel. This should be done as frequently as possible.

Steps involved in proper hand washing are as follows: [7,8]

- **Wet:** Put both your hands under clean, running water.
- **Lather:** Apply a generous amount of soap to the inside and back of your hands as well as your fingertips. Wash your hands for at least 20 seconds (sing happy birthday) and do not forget to wash under jewellery and fingernails. Your fingertips are especially important as people often put their fingers on their face, nose, and eyes. This is how the virus spreads.
- **Scrub:** Rub both hands together and move your fingertips around both hands. You do not need a scrub brush. You do not need to make harsh, scrubbing movements.
- **Rinse:** Return both hands to the running water and gently wash away the soap.
- **Dry:** Completely dry the water from your hands. Using a disposable towel (paper towel) is best to avoid leaving germs on towels. Air dryers, commonly found in public bathrooms, are also effective.

Science has shown that washing your hands for 20 seconds is effective in killing germs. Patience is required for this. Experts say that washing your hands while singing Happy Birthday twice makes the experience quick and pleasant. [7,8]

Proper handwashing not only reduces the spread of Coronavirus (COVID-19), it can prevent the spread of other viral illnesses such as cold and flu. Handwashing also reduces the risk of getting other easily spread infections, such as *SARS* (severe acute respiratory syndrome) and *MERS* (Middle East respiratory syndrome).

In Kenya, several innovations have come up to assist the population with the process of handwashing during this period of Covid-19 pandemic. Normal water containers have been modified by addition of metallic or plastic taps in line with the requirement for washing hands with running tap water. These have been distributed in most counties in the country.

Traditionally, most Kenyans washed hands prior to having a meal. It is now not easy for most of them especially in the rural areas to accept the change to washing hands frequently for prevention of the covid-19 rather than in anticipation of a meal.

Challenges of Handwashing in Kenya

Several challenges have been encountered by handwashing as a preventive measure against covid-19. Running tap water is not available in most parts of the country including big cities like Nairobi and Mombasa. These may negate the efforts of combating the pandemic. Extreme weather conditions also pause a challenge to using handwashing as a preventive measure against covid-19. The recent floods in most parts of the country in the months of April and May, 2020, particularly the western part leading to displacement of thousands of people gives a very good example

Biochemistry of Covid-19 and hand washing

The structure of the Covid-19 virus consists of a phospholipid bilayer that can easily be destroyed by detergents and any soap. Handwashing with soap for an extended period of 20 seconds disrupts this lipid bilayer resulting in complete destruction of the virus.

Conclusion

Handwashing has now been accepted as the first line of protection against the current Covid-19 pandemic. In absence of running tap water and soap, use of sanitiser composed of at least 60 to 70% ethanol is an accepted alternative. According to WHO's latest information, the Corona virus (covid-19) pandemic may be here for quite a while or may be with us for the rest of the time. Handwashing, therefore, will be part of our everyday routine practice to help us to combat the virus.

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