CPR and COVID-19: Aerosol-spread during chest compressions

The Coronavirus Disease 2019 (COVID-19) spread all over the world and became pandemic 1. There is a high risk of infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) during patient care for medical professionals particularly in aerosol-generating procedures such as endotracheal intubation and cardiopulmonary resuscitation (CPR) 1,2. Data from China, where SARS-CoV-2 emerged, the spectrum of disease (N = 44415) was severe in 14% (6168 cases) and critical in 5% (2087 cases) 3. In Italy, of all COVID-19 cases reported in March (22512), 9% (2026 cases) were health care workers 4. Adequate protection especially during aerosol-generating procedures is of utmost importance. Currently there is little data regarding safety precautions during cardiopulmonary resuscitation. There are different recommendations for staff protection during CPR e.g. using a face mask or oxygen masks on the patients face 5. We sought to visualize the effect of different methods of airway management on aerosol spread during CPR.

To visualize aerosol spread of SARS-CoV-2 we used a nebulized disinfection detergent detectable by ultraviolet light (Ecolab magic blue). The nebulizer was connected to simulated lungs of a CPR dummy and chest compressions were performed. We documented the spread of the luminescent aerosol by taking photos from a standardized angle in a dark room.

Most spread particularly into the direction of the provider was recognized during compression-only-CPR without any airway device. Use of a face mask on the patients face deflected the flow of the aerosol to the patient’s forehead. The use of an oxygen mask with or without gas flow showed diffuse deflection of the aerosol spread. Inserting a laryngeal tube connected to an airway filter lead to a remarkable reduction of visualized aerosol.

Our findings suggest that the early insertion of a laryngeal tube connected to an airway filter during CPR reduces the aerosol spread with potential infection of SARS-CoV-2.

Ein Bild, das Foto, verschieden, klein, sitzend enthält.

Automatisch generierte Beschreibung

1. Alhazzani W et al. Surviving Sepsis Campaign : Guidelines on the Management of Critically Ill Adults with Coronavirus Disease 2019 ( COVID-19 ) [Internet]. 2020 [cited 2020 Mar 22];Available from: https://www.sccm.org/getattachment/Disaster/SSC-COVID19-Critical-Care-Guidelines.pdf?lang=en-US

2. Chun-Hei Cheung J, Tin Ho L, Vincent Cheng J, Yin Kwan Cham E, Ngai Lam K. Staff safety during emergency airway management for COVID-19 in Hong Kong. Lancet Respir 2020;

3. Wu Z, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention. JAMA [Internet] 2020;Available from: http://www.ncbi.nlm.nih.gov/pubmed/32091533

4. Livingston E, Bucher K. Coronavirus Disease 2019 (COVID-19) in Italy. Jama [Internet] 2020;2019:2020. Available from: http://www.ncbi.nlm.nih.gov/pubmed/32181795

5. Resuscitation Council (UK). Guidance for the resuscitation of COVID-19 patients in hospital [Internet]. 2020-03-19. 2020 [cited 2020 Mar 19];Available from: https://www.resus.org.uk/\_resources/assets/attachment/full/0/36100.pdf