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# Sars-Cov-2 Virus and Eye

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## Abstract

It is a minireview about the impact of SARS COVID-19 pandemia on Ophthalmology. Since 1990's this virus was studied and some researchers showed its retinotropism. Nowadays, according to the World Health Organization guidelines, we explain how Italian ophthalmologist and nurses faced the effect of this pandemia on our daily work.

**Keywords:** Covid-19; Eye; Immunology; Transmission; Vaccine

**Abbreviations:** WHO: World Health Organization; SARS: Severe Acute Respiratory Syndrome; ARDS: Acute Respiratory Distress Syndrome; ECOR: Experimental Coronavirus Retinopathy; RPE: Retinal Pigment Epithelium; PPE: Personal Protective Equipment; FDA: Food and Drug Administration.

## Impact of SARS COVID-19 Pandemia on Ophthalmology

Coronavirus is actually responsible of the pandemia declared by the World Health Organization (WHO) on March 11 2020 [1,2]. It is a genetic and viral variant of Severe Acute Respiratory Syndrome (SARS). It is responsible of different symptoms such as an acute respiratory distress syndrome (ARDS) that might lead to fatal events [3]. Since 1990's there is a model of murine experimental coronavirus retinopathy (ECOR) [4,5]. Interestingly this virus, independently from the inoculation route into the eye, has a retinotropism. It is located in the inner nuclear layer, photoreceptors, Muller cells and retinal pigment epithelium (RPE). At day 10 it arrives at ganglion cell layer. The infection of the eye seems to have two phases. The first one triggers the immune system while the second is an autoimmune disease.

Tears are an inoculation and possible transmission route for this virus [6-9]. Some viral conjunctivitis may be associated to this virus. Also retinal manifestations, such as cotton wool spots, intraretinal hemorrhages and retinal vein occlusion were described in COVID-19 patients [10].

That's why Italian ophthalmologist immediately used personal protective equipment (PPE), hygiene and disinfection to avoid virus spread and transmission [11-13]. In some settings, such as public first aid department, apart from face surgical masks and gloves there are face shields and plastic protection for our instruments.

A new technology platform using self-assembling peptide nanofibers tagged with antibodies can be an effective SARS-CoV-2 vaccine, according to a proof-of-concept study published in Science Advances on August 7th 2020. The Food and Drug Administration (FDA) approved these vaccines in the USA. Also in Europe our regulatory agencies approved some vaccines against SARS-COV-2. Since last December 27th 2020 in all European countries and also in Italy we started to administer these vaccines first to health workers and to elder population according to age and illness criteria. Up to date we arrived to a third booster dose to of age population and started to vaccinate young people (5-11 years old). Some side-effects were registered worldwide, mostly myocarditis in young people and ocular inflammation in elderly population (unpublished data). Most of the events had mild clinical course with rapid resolution of symptoms and a good

visual outcome therefore the vaccination campaign did not really stop. Another possible therapy is the use of monoclonal antibodies. They were first used in USA and they are now approved also by European and Italian regulatory agencies. They are administered in selected public hospitals. The time of administration is about one hour and patients are under clinical observation for further one hour. The results of this therapy are very good as for safety and efficacy. As therapy, it is also possible to use an antiviral drug against Coronavirus.

In memoriam of Colleagues and nurses who passed away during this pandemia.

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