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Letters to the Editor

Precautions in ophthalmic practice in a hospital with the risk of COVID-19: experience from China

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Editor,

The coronavirus disease (COVID-19) was first found in December, 2019 in Wuhan, China. It swept through China and worldwide. It can cause severe acute respiratory infection with an incubation period of 1–14 days (Chen et al. 2020; Huang et al. 2020), and mainly spread by respiratory droplets, although spreading by discharges, faeces, aerosol, conjunctiva, etc. was also suspected (Li et al. 2020). Ophthalmologists often contact with patients closely and are exposed to risk of cross infection. It is important that the ophthalmologists get acquaintance with strategy of protection during clinical practice.

Personal protection of ophthalmologists: since the safe distance of droplets transmission is ≥1.5 m, we suggest ophthalmologists taking different levels of protection according to clinical practices (Table 1). Management of hand hygiene should always be strictly complied with.

Disinfection of inspection equipments: SARS-CoV-2 is sensitive to UV and heat. It can be inactivated at 56°C for 30 min or by lipid solvent such as ether, 75% ethanol, chlorine disinfectant, peracetic acid and chloroform. A shield plate should be installed on the slit lamp to prevent droplets transmission. Slit lamp, automatic refractor, corneal topography, OCT, fundus camera and fluorescein angiography should be cleaned with 75% ethanol or 3% hydrogen peroxide tampon. Appliances directly contacting with patients' ocular surface, such as Goldmann applanation tonometer, gonioscope, specular microscope, ultrasound probe and UBM probe, should be soaked by 2% alkaline glutaraldehyde, washed by flowing water and then cleaned by 75% ethanol or 3% hydrogen peroxide tampon (Rutala 1996). Since microaerosol might be formed due to tear film dehiscence, the non-contact 'air-puff' tonometry should be placed in ventilated place, and the probe should be well disinfected every time after use (Britt et al. 1991).

Outpatient care: a triage system should be run by experienced nurses. The nurse should measure body temperature and inquire contact history of all the patients. Patients with fever or contact history of COVID-19 patients within 14 days were guided to the fever clinic for further evaluations. Only patients without fever or contact history are allowed to enter the eye clinic. The patients should put on masks as well. The clinic should be well ventilated, disinfected with UV of 250–270 nm for 30–60 min. The staff are encouraged to follow the precautions listed above and discard gloves, wash or alcohol-rub the hands and then put on new gloves in-between case.

In-patient care: during the epidemic period, diseases admitted to the eye ward should be arranged accordingly. Only ocular emergencies such as eye traumas, acute glaucoma, rhegmatogenous retinal detachment and central retinal artery occlusion are considered for admission. The patients of new admission should be arranged one person in one room and be monitored attentively.

Ophthalmic operation care: non-urgent interventions such as barrier laser, YAG: Nd laser capsulotomy, pan-retinal photocoagulation, incision and curettage should be suspended or performed only when necessary. While ruptured eyeball, intraocular foreign body, acute glaucoma, rheugmatogenous retinal detachment and central retinal artery occlusion could be arranged for operation. Operation should be performed in well-ventilated or negative pressure environment. The operating room is regarded as a high-risk area, and universal precaution measures with barrier apparels should be strictly taken.

The SARS-CoV-2 is one of the viruses against which we need protection in ophthalmic setting. The measures we mentioned here may help protect from COVID-19 and reduce the risk of its further spreading within hospital.

Table 1. Personal protective equipments

Level of risk	Procedures	Protective equipments
Low risk	Indirect contact with suspected patients, consultation, inspection without examinations or performance procedures	Gown, surgical mask, disposable cap
Moderate risk	Examination with slit lamp, funduscope, gonioscope, ophthalmic ultrasound, UBM, fluorescence angiography, puncture, injection and laser therapy	Water repellent gown, barrier apparel, surgical mask or N95 respirator, disposable cap, gloves, goggle or face shield, shoe covers
High risk	Specimen collection from the eye, intraocular surgery	Water repellent gown, barrier apparel, N95 respirator, disposable cap, double gloves, goggle or face shield, shoe covers

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Colour change in the newborn iris: 2-year follow-up of the Newborn Eye Screening Test study

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Dear Editor,

The Newborn Eye Screening Test (NEST) study is a prospective cohort study that aims to determine the prevalence of ophthalmic diseases at birth at Lucile Packard Children's Hospital at Stanford University School of Medicine. Our prior study demonstrated the predominance of brown iris coloration during the first year of the NEST study (Ludwig et al. 2016). Here, we aim to assess the change in iris colour over a 2-year follow-up period. This study was approved by the Institutional Review Board and Ethics Committee at Stanford University. All participants screened during the first year of enrolment, were called and asked to assess their newborns' eye colour 2 years after hospital discharge. The follow-up iris colour and updated demographic data were compared with the images which had been reviewed by paediatric vitreoretinal specialist (DMM) within the first few days of birth.

Of the 202 newborns enrolled in NEST within the first year, 148 (73%) responded at 2-year follow-up. Brown was the most prevalent primary iris colour (52.0%, 77/148, Table 1) and was less likely to change over time compared to non-brown iris colours (brown to brown, 94%, 73/77). There was a higher frequency of change from blue to non-blue iris colours (blue to brown 27%, 11/40, blue to hazel 7.5%, 3/40 and blue to green 5%, 2/40; p value < 0.001). We found no significant difference in the pattern of iris colour change as a function of gender ($p = 0.861$). Regarding race, at birth, the prevalence of blue irides was significantly higher among White/Caucasian, Native Hawaiian or Pacific Islander indicating a significant difference in distribution of iris colour between races ($p < 0.001$) (Ludwig et al. 2016). The same significant difference in distribution of iris colours is also seen at 2-year follow-up in the present study ($p < 0.001$). Our results indicate that iris colour did not change over the 2 years' follow-up period in most cases (66.9%), and only the iris colour of 3.4% (5/148) of subjects became lighter from brown to hazel/green, from partial heterochromia to blue and from complete heterochromia to blue. Similarly, the Louisville Twin Study revealed that iris colour stabilizes by 6 years of age in most children. However, they noted that iris colour continues to change throughout adolescence and until adulthood in a subpopulation of 10–20% of twins (Bito et al. 1997). The present study, however, is the first to follow iris colour changes from shortly after birth to 2 years of age. Though a significant association between age and gender on iris colour was seen previously in a large cross-sectional study (Liu et al. 2010), no statistically significant correlations between iris colour, ethnicity, sex, gender, multiplicity and being the first-born child were observed in our study. As predicted, the distribution of iris colour at 2-year follow-up was significantly related to race. While families tend to identify the iris colour of their newborns, physicians should also monitor the iris colour of their patients. Changes in iris colour may reveal signs of pathology such as neurofibromatosis, Down syndrome, herpes simplex, pigment dispersion, albinism or primary melanocytic tumours of the iris (Mackey et al. 2011).

To our knowledge, this is the first study to evaluate the frequency of subjective change in iris colour from birth to 2 years of age. Overall, we report a low rate of subjective change in iris colour from birth to 2 years of age among newborns with brown eyes and a slightly higher rate of change among newborns with blue eyes.

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