**Guidance on the prevention and control of novel coronavirus in ophthalmology**

**Shanghai ophthalmic clinical quality control center**

**（First Version）**

Recently, it is becoming increasingly severe to prevent and control novel coronavirus. First level response mechanism for public health emergencies has been launched in Shanghai. The incubation period of novel coronavirus pneumonia (NCP) is 1~14 days, and all people is vulnerable. It is transmitted mainly through respiratory droplets, and also probably through excretion (such as feces), conjunctiva, nasal mucosa and mouth. There are three key links of prevention and treatment of infectious diseases, including controlling the source of infection, cutting off the transmission route and protection of vulnerable people. It is necessary for ophthalmologic staffs to taking preventive measures of disinfection and protection because patients possibly infected via conjunctiva have been found. According to the epidemic situation and National and Shanghai epidemic prevention work requirements, Shanghai ophthalmologic clinical quality control center has formulated the following guiding opinions.

**1. General requirements**

1.1 Medical institutions should avoid hospitalization of ordinary patients who are not emergency or confine surgery, and these patients should be hospitalized at the selected time after control of the epidemic situation.

1.2Try to avoid non-emergency ophthalmic examination (especially all kinds of contact examination, such as applanation tonometry, three-mirror contact lens, etc.)

1.3 Patients who are suspected NCP need ophthalmic treatment: if they are out of hospital, they should be transferred to the designated hospitals for investigation and then decide whether to treat eye diseases. If the patient has been hospitalized, he/she shall be isolated timely and treated by designated personnel, and transferred to the designated hospitals as soon as possible, then start the pathogen detection process and report to the epidemic prevention management department of the institution.

**2. Prevention and control management of ophthalmic clinics**

2.1 Strengthen previewing and triage. Set up a fever detector at the entrance of outpatient and emergency, and post a notice to inform patients with fever to go to the fever clinics.

2.2 Try to avoid non-urgent eye specialist examination. Ophthalmologists must take protective measures. Patients who are confirmed or highly suspected NCP should be checked at the hospital designated by the local health commission. Non-designated hospital should refer patients timely.

2.3 The outpatient physician should inquire about the epidemiological history of patients, and patients with definite epidemiological history should be reported to relevant departments. If no epidemiological history, the routine diagnosis and treatment should be carried out.

2.4 The area of waiting, diagnosis and treatment should be well ventilated, and patients’ waiting time should be shortened as much as possible. It is suggested to control the number of patients by appointments in advance. The waiting area should not be gathered or crowded, one person one clinic room to avoid cross infection. The medical equipment in the diagnosis and treatment environment (diagnosis room, examination room, such as air, ground, object surface) must be disinfected every day, strictly in accordance with the relevant disinfection specifications or regulations.

If the goals above can’t be achieved and the medical protective materials cannot be guaranteed, ophthalmic departments can apply to the medical institutions or health administrative departments to reduce or suspend the general outpatient service, and only the emergency department can be reserved.

**3. Disinfection of ophthalmic examination instruments**

Novel coronavirus is sensitive to UV and heat. The virus can be effectively inactivated at 56 ℃ for 30 minutes, or 75% ethanol, chlorine containing disinfectant, peracetic acid and chloroform. While chlorhexidine can not effectively inactivate the virus. Therefore, the following suggestions are put forward, with reference to the disinfection measures of ophthalmic examination instruments during the SARS epidemic.

3.1 Disinfection of contact inspection instruments

Ophthalmic examination instruments, such as the pressure head of Goldmann's tonometer, anterior chamber angle mirror, trihedral mirror, various ophthalmic laser contact lenses, eye A-ultrasound probe, etc., directly contact the patient's ocular surface and tears during outpatient and ward examinations. In order to prevent cross infection through the above examination instruments and ensure the safety of patients and medical staff, ophthalmic contact examination instruments should be effectively sterilized before re-use.

3.1.1 Clean the appliance first and then wipe it with 75% ethanol or 3% hydrogen peroxide cotton ball carefully at least 3 times before use.

3.1.2 Or immerse the appliance in 10% sodium hypochlorite (household bleach), 3% hydrogen peroxide or 70% isopropyl alcohol for 5 minutes, and then dry it with sterilized cotton ball.

3.1.3 Whatever kinds of disinfection method is adopted, the disinfectant should be carefully removed with normal saline before using to avoid corneal damage.

3.2 Disinfection of non-contact inspection equipment

Non-contact ophthalmic examination equipment, including slit lamp, non-contact tonometer, OCT, perimetry machine, IOL master, corneal endothelium machine, corneal topography, etc., 75% alcohol cotton ball should be used to wipe the areas where chin, forehead and hand contacted, as well as to disinfect the examination parts close to the cornea of patients before and after use.

**4. Protection of ophthalmic medical staff**

Recent reports suggest that new coronavirus may cause conjunctivitis. At present, the clinical observation shows that NCP patients may have conjunctivitis, the incidence rate is not high and severity is different, it can be monocular or binocular disease. In the early stage, conjunctival congestion occurred with a small amount of watery, thin mucoid secretions, and occasionally small pieces of subconjunctival hemorrhage; severe patients may develop severe conjunctival congestion and edema. Whether these manifestations are caused by novel coronavirus remains to be confirmed. Although NCP patients with conjunctivitis at the first visit are very rare, ophthalmologists still need to take measures to protection themselves.

4.1 Evaluate the following factors to screen patients who may be infected with NCP:

(1) Do you have fever and/or respiratory and digestive system symptoms;

(2) Have you been to the epidemic area in the last 14 days;

(3) Have you ever contacted with the confirmed patients or persons in the epidemic area.

Medical institutions should immediately report patients who meet the above criteria in order to test patients for novel coronavirus.

4.2 When ophthalmologists examine patients with slit lamp microscope and ophthalmoscope, they are inevitably in close contact with patients. Therefore, ophthalmologists should pay special attention to the following protective measures during diagnosis and treatment.

4.2.1 Ensure one doctor, one patient and one clinic room, and avoid several patients staying at one room. Keep air circulation in the clinic room, avoid crowds gathering during treatment, and instruct patients to wear masks.

4.2.2 Medical personnel need to wear surgical masks, gloves and goggles, and protective clothing in special cases. It is recommended that medical workers at the outpatient/emergency pre-check triage entrance, outpatient nurse station, doctor's clinics, should be equipped with protective equipment (three-level protection), including work clothes, working caps, medical surgical mask, disposable isolation clothing, goggles/protective screen, latex gloves.

4.2.3 Install the slit lamp microscope isolation plate (made of CT or X-ray film). Avoid talking during the inspection. If the fundus needs to be inspected, indirect fundus glasses or fundus photography can be used instead of the direct ophthalmoscope in close contact.

4.2.4 If possible, use ophthalmic imaging equipment and avoid eye contact examination and invasive examination in order to avoid direct contact with patients.

4.2.5 The mandible bracket, bench and other contact points of slit lamp microscope should be disinfected and washed one by one after the examination.

These methods can reduce the spread of the virus between ophthalmologists and patients.

**5. Preoperative screening of patients undergoing ophthalmic surgery and protection of medical staff during perioperative period**

When patients who are confirmed or highly suspected NCP need emergency ophthalmic emergency surgery, they should be transferred to the hospitals designated by the municipal and District Health Protection Committee for further screening and treatment. Only one family member is allowed to accompany the patients who come from the epidemic areas and whose isolation period is not more than 14 days, and the caregivers should also be screened. At the same time, the medical staff should enhance perioperative protection.

5.1 Reduce unnecessary face-to-face communication. If fundus inspection is needed, indirect fundus or fundus photography can be used to replace the direct ophthalmoscope examination.

5.2 It is recommended that surgeons take three-level protection: wearing disposable work cap, medical protective mask (N95), protective glasses, comprehensive protective mask, disposable protective clothing or disposable impermeable isolation clothing, disposable latex gloves.

5.3 Take off outer disposable protective clothing, shoe covers, hats, masks, gloves, etc. after operation, and put these into the double disposable medical waste bag, and wash hands according to the "seven step washing method" or use the quick hand disinfectant for 2 minutes.

5.4 Non-general anesthesia patients should wear surgical mask, and anesthesia machine should be disinfected according to the standard after general anesthesia operation.

5.5 Put surgical instruments into a double-layer yellow medical waste bag after operation, tie it tightly and place separately for subsequent disinfection.

**6. Prevention and control management in ophthalmic wards**

6.1 Local patients who have been admitted to the hospital with signs of critical illness must be inquired about their journey within 14 days, their history of close contact, and whether have any discomfort such as fever and cough. Once the patient has above symptoms and experience, the staff must promptly report this to the epidemic prevention management department of the hospital. If the above conditions are excluded, the patient can be admitted to hospital, but it is recommended that patient with stable condition or critical condition be separately admitted and treated, meanwhile, health care staff should strengthen education and closely monitor the patient until 14 days.

6.2 Strictly implement the visiting regulations, reduce mobility of people and enhance health education of inpatients and their families. No family members accompany in principle. The number of family member accompany should be strictly controlled and the family carers should be fixed, one-to-one accompany. The family carers must take temperature and finish the required inspections, and be supervised and educated to keep hand hygiene.

6.3 Implement daily report system of inpatients with fever. Doctors and nurses in every ward report fever cases to the epidemic prevention management department every day.

6.4 Enforce garbage classification management to keep environment clean. Clinical waste and domestic waste should be strictly classified. Waste from suspected or confirmed cases should be disposed as infectious waste. Keep wards clean and hygienic, Strengthen ventilation. The wards environment (such as air, ground, object surface) and medical instruments must be daily disinfected according to relevant systems and norms.

**7. Responsibility**

At present, the epidemic situation of new coronavirus is still complex and severe. Ophthalmic medical staff should ensure disinfection of inspection equipment, enhance awareness of protection, improve protective measures, reduce nosocomial cross infection in routine work, and fight against the epidemic together.

Strictly comply with the latest prevention and control requirements issued by the State Council of the PRC, Shanghai municipal government, National Health Commission of the PRC, Shanghai Health Commission and other relevant departments, to ensure the quality and safety of ophthalmology clinical work.

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