



## Teleophthalmology in COVID-19 era: an Italian ophthalmology department experience

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### To the Editor:

We read with interest the recently published article by Teo et al. [1]. The authors state that the ophthalmology community as a whole is coping with significant changes for the management of outpatient and follow-up visit schedule during and after the lockdown period for COVID-19 pandemic. These modifications could be an opportunity to explore novel strategies and protocols used in clinical setting in COVID-19 era.

While we agree with the authors, we would like to discuss about our novel hospital protocols at our Ophthalmology Clinic to manage safely and effectively patients with ocular diseases, avoiding their access to the hospital during the lockdown of our country where the outbreak was one of the largest in the world [2, 3].

A telephonic health service with a dedicated telephone number was activated for patients to explain their ocular problems directly to specialist ophthalmologists; an institutional email was also provided to consent attached files of ocular images to better understand the diagnosis. The first step of our tele-triage was a tele-questionnaire administered to all subjects requiring the telephonic consultation, and contained questions concerning demographic and clinical data, as shown in Fig. 1.

All the data of the tele-questionnaire were recorded by qualified ophthalmologists at our ophthalmic first aid, and a specific Ophthalmic Tele-questionnaire Score (OTS) (Fig. 2) was calculated for each patient. Based on the medical history, tele-questionnaire data and, if available, photo documentation, the ophthalmologist suggested to the patient a topical therapy, or recommended a control visit at a hospital ophthalmological emergency service. When a topical therapy was suggested, patients were re-called to verify the symptoms resolution at a pre-established interval, which was based on the nature of symptoms reported. In case a concomitant systemic therapy was deemed necessary, the patient was recommended to manage any side effect with his general practitioner. When analysing the primary motivations that induced patients to require an ophthalmology tele-triage, we found that, overall, the most common ones were ocular surface-related symptoms (Table 1). In more than 95.2% of cases, the tele-intervention was useful to completely solve the clinical questions reported by patients, with symptoms disappearing with a mean time of  $5.1 \pm 3.5$  days.

Extra-ocular-related motivations, such as anxiety and loneliness feelings accounted for less than 3% of the entire sample. Indeed, Coronavirus disease pandemic has become a challenge to psychological resilience and anxiety [4, 5].

If a bilateral conjunctival congestion was referred we accurately asked about other symptoms such as cough or fever and if so we suggested to call their general practitioner as well. After tele-survey we obtained a final score (OTS). The lower score, the better referred clinical signs. The highest OTS was found in elderly people, as expected.

In this dramatic psychological picture, the empathy of the healthcare professional supporting population through telemedicine could be the key to assure general mental health as well as to manage and treat patients in a remote location [6].

The use of telemedicine in Ophthalmology could be very useful to face epidemic conditions and also to streamline long hospital waiting lists in routine real life.

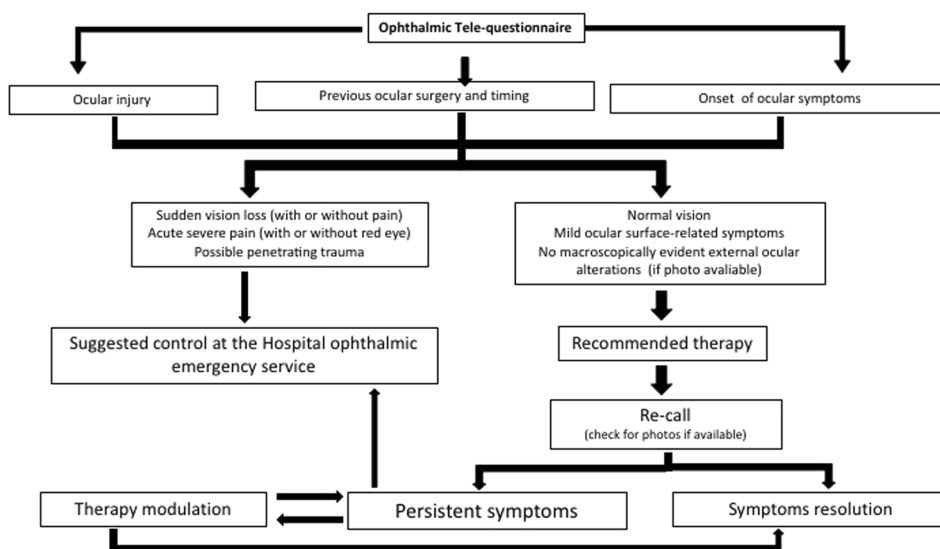
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**Fig. 1 Representative flowchart of emergency protocol.** The first step of our tele-triage was a tele-questionnaire. The flowchart describes the questions administered to all subjects requiring the telephonic consultation concerning demographic and clinical data.

**Ophthalmic Tele-questionnaire**  
Patient ID: \_\_\_\_\_

1. Acquisition of oral informed consent
2. Age? \_\_\_\_\_
3. Sex? \_\_\_\_\_
4. Why are you contacting the Ophthalmology Clinic?

| <i>PREVIOUS EYE CONDITION? [Y or N]</i>  | <i>NEW-ONSET EYE DISEASE? [Y or N]</i>   |
|--|--|
| - Which kind of eye disease?   | - Please describe your symptoms  |
| - Are you taking chronic and topical medical therapy?<br>Y or N  | - Did you have a decrease in visual acuity or have you had an eye injury?<br>[Y or N]  |
| - Have you continued to follow the recommended therapeutic indications<br>[Y or N]   | - Is (are) your eye (s) red?<br>[Y or N]   |
| - Have you recently (last 3 months) underwent to ophthalmic surgical/laser procedure?<br>[Y or N]                                      | - Did the symptom appear less than 1 week ago?<br>[Y or N]   |
| - Have you followed the recommended therapeutic indications after surgery?<br>[Y or N]   | - Do you usually wear contact lenses?<br>[Y or N]  |
| - Have you changed anything in your lifestyle?<br>[Y or N]   | - Were you at home, or domestic situation, when the symptom appeared? [Y or N]   |
| - Did you take any new medications in the last 2 months?<br>[Y or N]   | - Have you taken any topical or systemic medication?<br>[Y or N]   |
| - Did you have some contacts with positive COVID-19 or have you any extra-ocular symptoms (fever, irritating cough, etc.)?<br>[Y or N] | - Did you have some contacts with positive COVID-19 or have you any extra-ocular symptoms (fever, irritating cough, etc.)?<br>[Y or N] |
| <b>TOT SCORE:</b> _____  | <b>TOT SCORE:</b> _____  |

Assign 1 point to each response "Y".

**Fig. 2 Tele questionnaire to patients during tele triage.** A specific Ophthalmic Tele-questionnaire Score (OTS) was calculated for each patient using a total sum, assigning one point for each "yes" response (Y) and no point for each "no" response (N).

**Table 1** Demographic and clinical data of enrolled patients.

|   |  |
|---|--|
| Age (years): mean ( $\pm$ SD)   | 55.3 ( $\pm$ 17.8)   |
| Sex (M/F) <i>n</i> (%)  | 88/142 (38.3/61.7)   |
| Geographic residence <i>n</i> (%)   | - Intra-region 134 (58.3)<br>- Extra-region 96 (41.7)  |
| Primary reason for ophthalmic tele-triage (%)                                   | - Ocular pain (18.3)<br>- Burning (16.5)<br>- Conjunctival congestion and redness (15.6)<br>- Photophobia (15.2)<br>- Foreign body sensation (12.2)<br>- Clarifications and suggestions for contact lens wearers (11.9)<br>- Itchy eye (10.1)<br>- Epiphora (9.6)<br>- Eyelid cyst-like neoforation (7.8)<br>- Visual acuity reduction (7.4)<br>- Clarifications on previous local/systemic therapies (6.5)<br>- Absence of ophthalmic symptoms, but anxiety and loneliness (2.6)<br>- Other symptoms (2.2)  |
| Ocular conditions <i>n</i> (%)  | 143 (62.3)<br>Previous surgery (39.2) <ul style="list-style-type: none"> <li>• cataract (28.2)</li> <li>• retinal detachment (26.7)</li> <li>• IV anti-VEGF injection (15.2)</li> <li>• glaucoma filtering surgery (12.8)</li> <li>• corneal transplantation (11.5)</li> <li>• other ophthalmic surgeries (4.6)</li> </ul> Concomitant ocular diseases <ul style="list-style-type: none"> <li>• Glaucoma (18.5)</li> <li>• Corneal and ocular surface diseases (16.4)</li> <li>• Retina diseases, not treated with IV anti-VEGF injections (12.4)</li> <li>• Diabetic retinopathy (10.3)</li> <li>• Other (3.2)</li> </ul> |
| Patients sent to hospital ophthalmic emergency service, <i>n</i> (%)            | 12 (4.8)   |
| Outcome for non-hospitalized patients after teleintervention days, <i>n</i> (%) | 5.1 ( $\pm$ 3.5)   |

IV intravitreal, VEGF vascular endothelial growth factor.

Tele ophthalmology, in fact, is not the same as a face-to-face clinical examination, however, it has become essential to cope with this nationwide public health emergency to keep safe both population and health workers. Moreover, ophthalmology field is particularly suitable for use of telemedicine in making diagnosis based on data and digital images and in providing outpatient telehealth services to people in a remote location, also in clinical practice and in primary settings.

### Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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