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CORRESPONDENCE

Implementation of a new telephone triage system in ophthalmology emergency department during COVID-19 pandemic: clinical effectiveness, safety and patient satisfaction

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To the Editor:

Since the WHO declaration of COVID-19 pandemic in March 2020, various countries have implemented regional and/or national lockdown with stringent rules on social distancing to minimise the risk of transmission. This has significantly affected the service delivery across all medical fields, including ophthalmology [1, 2]. In addition, studies have shown that patient would delay seeking ocular treatment due to fear of contracting COVID-19 infection [3, 4].

In response to the COVID-19 pandemic, we had reformed our eye emergency service in 2020 by introducing a new telephone triage system (TSS) to cope with the reduced health service capacity and protect patients and front-line staff, aligned with the national and Royal College guidance [5]. All patients were triaged and assessed via TTS before being accepted for face-to-face consultation if deemed necessary. In this study, we aimed to report the effectiveness, safety, and acceptability of this new TSS.

All telephone triage encounters and attendances to the eye emergency department (EED) at Sunderland Eye Infirmary, UK, during April–May 2020 were included. Relevant data, including the number of attendances, waiting times, presenting diagnoses and patient/staff satisfaction (assessed via questionnaires—Supplementary Material), were analysed. The safety of TSS was examined via analysis of repeat callers (patients who accessed the TSS more than once for the same complaint) and their final diagnosis at EED. Ethical approval was not required as this retrospective study was considered a clinical service evaluation study.

Of all 2682 phone calls ($n = 2293$ patients), 52% were managed successfully via TSS and 48% subsequently reviewed at EED. Compared to 2019, there was a significant 65% reduction in overall EED attendances ($p < 0.001$; Table 1). Mean arrival-to-treatment time significantly reduced by 43 min. There was a significant increase in ocular trauma and reduction in oculoplastic and conjunctival diagnosis ($p < 0.001$).

There were 169 (7%) repeat callers (Table 2), with a higher proportion in older age groups. Of those, 90 (53%) patients attended EED eventually. Following the review, only 7 (0.3%) triage decisions out of 2682 calls were considered inappropriate and classed as missed diagnosis. These included retinal detachment ($n = 2$), contact lens-related infectious keratitis ($n = 1$), wet age-related macular degeneration ($n = 1$), non-ischaemic anterior ischaemic optic neuropathy ($n = 1$), macular hole ($n = 1$) and marginal keratitis ($n = 1$). In all cases, the triage decisions were made by the consultants. Potential harm to vision was considered avoidable in four cases if the patient was reviewed earlier at EED.

A total of 69 (17%) patients responded to the survey. The majority (96%) of patients described their experience of using TSS as good-to-outstanding, 88% indicated that they would use the service again, 91% recommended the service, and 93% recommended the continuation of the TSS. Of 36 (64%) responded staff, 94% described a positive experience with the TSS and 100% recommended the future use of TSS.

The COVID-19 pandemic has posed an unprecedented challenge to ophthalmic service delivery due to cancellation

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Table 1 Summary of the patient attendances to eye emergency department in April–May 2019 and April–May 2020.

Parameters	2019 Total $N = 4566$ N (%)	2020 Total $N = 1342$ N (%)	P value[a]
Gender			<0.001
Female	2312 (50.6)	597 (44.5)	
Male	2254 (49.4)	745 (55.5)	
Age, years			<0.001
0–29	965 (21.1)	241 (17.9)	
30–49	1159 (25.4)	385 (28.7)	
50–60	1465 (32.1)	497 (37.0)	
>70	977 (21.4)	219 (16.3)	
Types of attendance			<0.001
New attendance	4104 (90.0)	1250 (93.1)	
Planned follow-up	236 (5.2)	61 (4.6)	
Unplanned follow-up	226 (4.9)	31 (2.3)	
Mean time to assessment, mins[b]	11.9 ± 1.0	6.9 ± 0.9	0.033
Mean time to treatment, mins[c]	76.5 ± 9.3	33.8 ± 6.4	0.042
Out of hours attendances[d]	916 (20.1)	217 (16.2)	<0.001
EED diagnosis			<0.001
Trauma	781 (17.1)	368 (27.4)	
Corneal	742 (16)	213 (16)	
Retinal	537 (12)	157 (12)	
Conjunctival	783 (17.1)	127 (9.5)	
Oculoplastic	682 (14.9)	149 (11.1)	
Others	1041 (22.8)	328 (75.6)	
Disposal description			<0.001
Discharge without follow-up	3291 (72.1)	1009 (75.2)	
Referred to clinic	579 (12.7)	178 (13.3)	
Review in EED	280 (6.1)	79 (5.9)	
Referred to GP	115 (2.5)	46 (3.4)	
Admitted	31 (0.7)	16 (1.2)	
Others	270 (5.9)	14 (1.0)	

[a]P values are calculated using Chi-square test (for categorical variables) and unpaired T test (for continuous variables). Continuous values are presented in mean ± standard deviation. Significant p values are underlined.

[b]Time from arrival to assessment.

[c]Time from arrival to treatment.

[d]Defined as between 17:00 till 8:00 next day.

of the routine services. To the best of our knowledge, this study serves as one of the few UK studies that examined the effectiveness and safety of TSS in a previously open-access EED during COVID-19 pandemic. Our data showed that TSS served as an effective model to triage the patients, with only ~50% converting to face-to-face consultation, paralleling with the findings in literature [6]. Furthermore, analysis of diagnoses demonstrated that there were fewer minor conditions being seen whilst the proportion of more serious or urgent ophthalmic diagnoses were maintained. We also observed a dramatic improvement in waiting time compared to before, which allowed strict social distancing precautions to take place and protect vulnerable patients from infection exposures.

Table 2 Triage outcome and level of triage assessor at repeat callers' 1st and 2nd triage encounter.

Parameters	1st Triage Total $N = 169$ N (%)	2nd Triage Total $N = 169$ N (%)
Triage outcome		
EED assessment	0 (0)	81 (48.2)
Over the counter treatment	85 (50.6)	35 (20.8)
Monitor symptoms	46 (27.4)	23 (13.7)
Referred to other services	33 (19.6)	24 (14.2)
Others	5 (2.9)	6 (3.6)
Grade of triage assessor		
Consultant	125 (74.0)	127 (75.1)
Registrar	10 (5.9)	14 (8.3)
Nurse practitioner	20 (11.8)	20 (11.8)
Not recorded	14 (8.3)	8 (4.7)

Notably, only 0.3% triage decisions were considered to be inappropriate. This was similar to a Paris study, which reported 1% of misdiagnosis of teleconsultation in EED leading to delayed ophthalmic care during COVID-19 lockdown [7]. We observed two missed cases of retinal detachment, highlighting the difficulty in safely triaging patients complaining of flashes and floaters. Furthermore, all missed diagnoses were made by consultants, suggesting that reliance on experience alone may not be sufficient to guarantee safety and a consistent triage protocol will be required. That said, nearly all patients and staff expressed high level of satisfaction with the TSS in view of the perceived benefits of immediate access to advice, reduced waiting time, prioritisation of true emergencies, and low risk of COVID-19.

Considering the persistent COVID-19 pandemic with further waves of infection, healthcare digitalisation using tele-ophthalmology (with potential integration of artificial intelligence) is emerging as a potentially long-term solution to assessing and managing ophthalmic diseases at the front-line service while minimising the risk of COVID-19 [8–10].

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Compliance with ethical standards

Conflict of interest The authors declare no competing interests.

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