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# Impact of combined live and cloud-based tele-ophthalmology system on referral patterns and disease identification at community eye centers in Nepal

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## BACKGROUND

The use of tele-ophthalmology service is rapidly increasing over the recent years. This has been the important service especially for those residing in rural and remote places as a rapid and early eye diseases screening for timely treatment. The study aimed to assess the impact of combined live and cloud-based tele-ophthalmology system on referral patterns and disease identification at community eye centers in Nepal.

## METHODS

The live and cloud based combined tele-ophthalmology service was studied in two community eye centress (CECs) located remotely in hilly part of Nepal. The sample size estimated was 600 study participants. All the consecutive patients presented at CEC at the age 19 years and above having diabetes mellitus, systemic hypertension, those with poor visual acuity and all patients 60 years and above were prospectively enrolled in the study.

Fundus camera was installed at the CECs and connected to the tele-ophthalmology reading centres located at the base hospital, Tilganga Institute of Ophthalmology (TIO). Ophthalmic assistants were trained for fundus photography, and live and cloud based connection of patients and taking their anterior segment and fundus pictures. The fundus camera used was the Right Cam FC 100 (Right Medical Devices Pvt LTD). Ophthalmologist were involved for live tele-ophthalmology service and retina specialist was involved for the cloud based grading of the fundus pictures. The types of pathology detected, rate of referral and its effectiveness were assessed. Ethical approval of the study was taken from the Nepal Health Research Council.

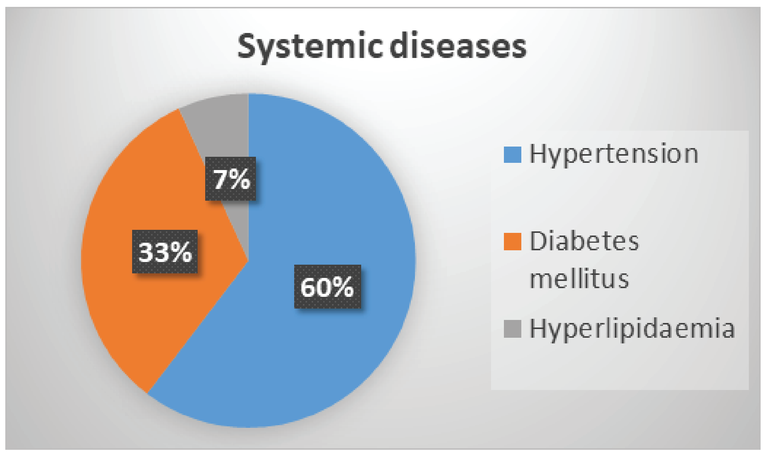
Written informed consent was taken from the study participants.

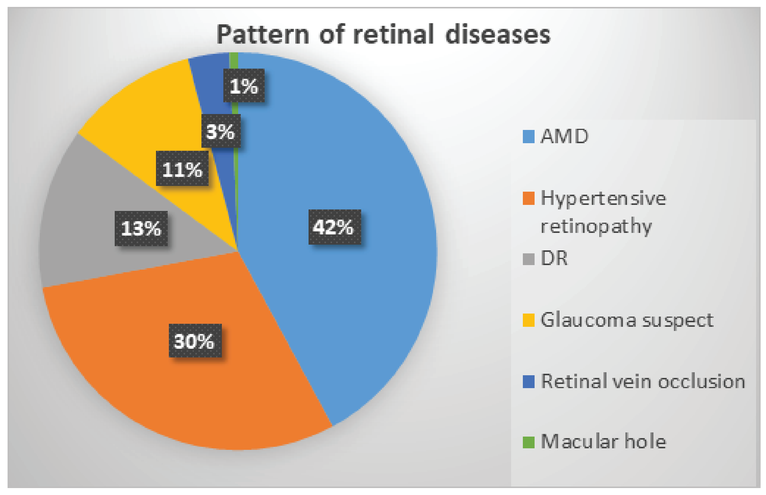
## RESULTS

A total of 600 study participants were enrolled in the study. The mean age of study participants was 62.3 years with SD 13.0. Male and female comprised of 220 (36.7%) and 380 (63.3%).

Nearly half of the study participants presented for poor vision right eye (RE) in 285 eyes (47.5%) and left eye (LE) in 289 eyes (48.2%).

Refractive error of any type except presbyopia was found in 124 (20.7%) in RE and 122 (20.4%) in LE.



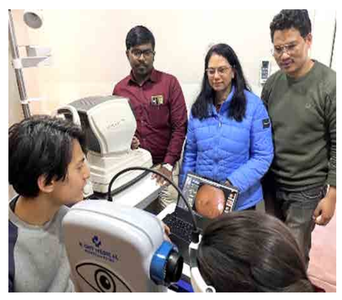



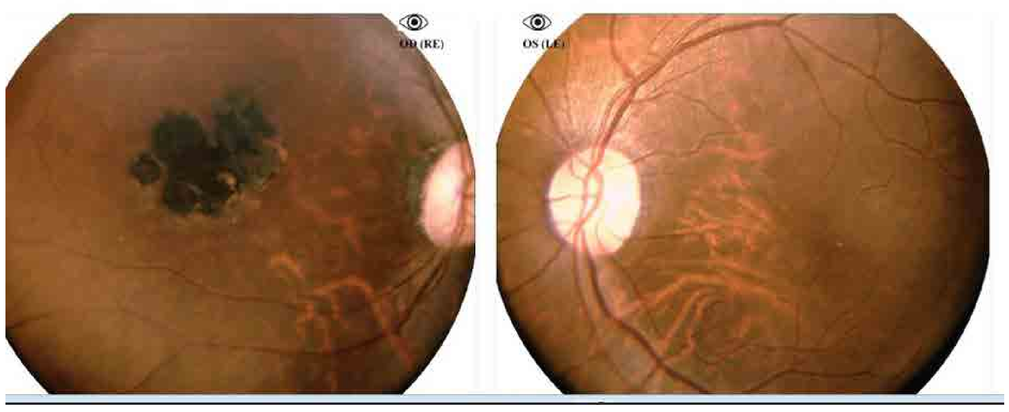

Cataract was the major anterior segment finding (33%), followed by pterygium and pinguecula (1.7%).

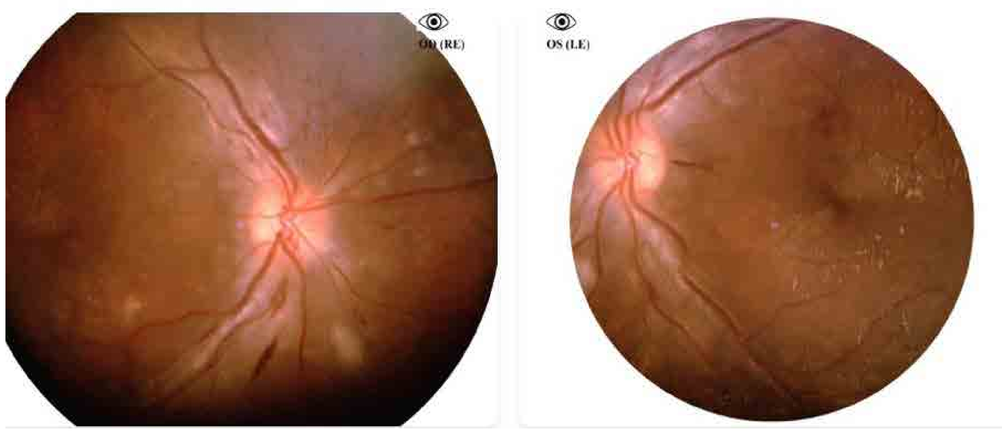
One third of the total cases were needed referral from the CECs. One fourth of them visited tertiary eye hospital for the treatment within 1 to 3 months. The referral pattern was almost similar to both the live and cloud based grading technique.

## IMPLICATIONS

Using the tele-ophthalmology system, there was detection of large number of patients having ocular diseases and timely referral. This has helped in disease identification and prompt referral of needy patients for further treatment reducing the blindness. Results will be disseminated to stakeholders and policy level.






## REFERENCES

1. Thapa R, Khanal S, Tan HS, et al. Prevalence, pattern and risk factors of retinal diseases among an elderly population in Nepal: the bhaktapur retina study. Clinical Ophthalmology. 2020 Jul 24:2109-18..

2. Collon S, Chang D, Tabin G, et al.Utility and feasibility of teleophthalmology using a smartphone-based ophthalmic camera in screening camps in Nepal. Asia-Pacific Journal of Ophthalmology. 2020 Jan 1;9(1):54-8.

3. Hong K, Collon S, Chang D, et al. Teleophthalmology through handheld mobile devices: a pilot study in rural Nepal. Journal of mobile technology in medicine. 2019 Jun;8(1):10-7309.

4. Bhattarai MD, Thapa R, Bajracharya MR, et al. Fundus Photography as the base of three-Tier Diabetic Retinopathy Care System to its wider roles: learning from a case experience. JNMA: Journal of the Nepal Medical Association. 2021 Jan 31;59(233):100.

5. Prathiba V, Rema M. Teleophthalmology: a model for eye care delivery in rural and underserved areas of India. International journal of family medicine. 2011;2011(1):683267.

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**Conflict of interest: None**

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