

Ophthalmoscopy is Way to Diagnosis

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Abstract

Objective: The aim of this study was to evaluate the basic knowledge and skills of doctors regarding ophthalmoscopy, working in tertiary care hospital, dealing mostly with patients having systemic diseases which can affect the retina.

Methodology: Quantitative cross sectional study was conducted in Ayub Teaching Hospital Abbottabad. Workshop has been conducted for medical post graduate trainees and few of the faculty members by ophthalmology department to promote learning of direct ophthalmoscopy and to create awareness about systemic diseases leading to retinal diseases. Pre workshop basic information about direct ophthalmoscopy was gathered through a questionnaire after obtaining consent of the participants. Data response was saved and evaluated in terms of percentages of responses. Excel sheet in SPSS version 25 were used to calculate the result. Percentages were calculated for every question evaluating ophthalmoscopy skill and need for making diagnosis.

Results: 46 participants attended the workshop 36 were male and 10 were female. 32 participants (69 %) agreed to have basic knowledge of ophthalmoscopy, but 65 % mentioned that they said that they can not perform distant direct ophthalmoscopy. In addition 61 % of participants responded that they can not perform near direct ophthalmoscopy and 71 % of participants responded with No option for focusing the disk. All these numbers suggest that direct ophthalmoscopy skills were not good enough for most of the participants. 90% of participants responded that they are not able to pick major pathologies e.g. DR and HTN.

Conclusion: Direct ophthalmoscopy is simple and important skill to be learned for improves clinical practices. This is much underused tool, which can help a lot to make diagnosis and manage accordingly in time. Every medical student should know the basic skills of ophthalmoscopy to make him/her a better future physician.

Keywords: DR (diabetic retinopathy), HTN (Hypertension), DM (Diabetes mellitus), association of university professor in ophthalmology (AUPO)

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Introduction

Direct ophthalmoscopy is important skill for accurate diagnosis in many sight or life threatening conditions,¹⁻² and there is general consensus that every medical graduate should know basic skills of ophthalmoscopy.³⁻⁵ According to standard adopted by association of university professor in ophthalmology (AUPO) and protocol set by American academy of ophthalmology, every medical graduate should be able to visualize the red reflex, retina and can focus the disk. They should be able to pick changes associated with different retinopathies. But unfortunately despite these recommendations, ophthalmoscopy is underutilized skill

by medical students and non-ophthalmologist.^{1,6,7}

Direct ophthalmoscopy is basic and simple skill which can help in making diagnosis and can be used to know the extent of the disease. Just absent of red reflex can tells a lot in a fraction of second e.g. cataract, vitreous hemorrhage, retinal detachment etc. this can help any non-ophthalmologist to properly refer patient to seek eye care by an ophthalmologist. In a same way retinal examination by near direct ophthalmoscopy can tell a lot about systemic diseases e.g. diabetic retinopathy, vasculitis, hypertensive retinopathy, raised intracranial pressure leading to papilledema and so on.

Diabetic retinopathy is common complication of diabetes

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mellitus.⁸ According to international diabetes federation no of diabetic patient will cross 629 million by 2045 with significant high incidence in low to middle income countries⁹, which is again a huge burden on economy of low income countries.¹⁰ The most common ways to detect diabetic retinopathy is direct ophthalmoscopy and slit lamp by microscopy.¹¹ As trained staff is not sufficient enough to carry out with diabetic retinopathy screening (DRS) in low income countries¹²⁻¹⁴, so direct ophthalmoscopy which required less effort and training should be adopted by general physicians for promote diagnosis and proper referral of patients for good management in time. The aim of this study was to know the extent of basic knowledge of our post graduate trainees working in medical unit Ayub Teaching Hospital regarding direct ophthalmoscopy. By improving basic skills of direct ophthalmoscopy in medical professionals, we can improve our referral system for proper management of patients in time. This can reduce the work load of ophthalmologist and his specialized skill can be utilized for proper management of that patient where his special role is required. At moment most of the ophthalmologist working hours are wasted in examination of normal fundus being referred by general medical practitioners.

Material and Methods

Quantitative cross sectional study was conducted in Ayub Teaching Hospital Abbottabad. This study was conducted on 15 OCT at Ayub Teaching Hospital in ophthalmoscopy workshop arranged for postgraduate students working in medical department by ophthalmology department.

Workshop has been conducted for medical post graduate trainees and few of the faculty members by ophthalmology department to create awareness about systemic diseases leading to retinal diseases and to promote learning of direct ophthalmoscopy. Data was collected through questionnaire in pre workshop. All the doctors who showed willingness to participate in this study were included in the survey. The questionnaire contained different questions regarding the basic knowledge and skills about ophthalmoscopy.

Analysis Technique: All data was saved on excel sheets. Percentages were calculated for every response and competencies of the participants were judged according to their responses to the mentioned skills. SPSS version 25 was used to analyze the data.

Results

Total 46 participants attended the workshop, 36 were male and 10 were female. Out of total 32 participants (69 %) agreed to have basic knowledge of ophthalmoscopy, but 65 % mentioned that they could not perform distant direct ophthalmoscopy. In addition 61 % of participants could not perform near direct ophthalmoscopy and 71% of participants could not focus the disc. All these numbers suggest that direct ophthalmoscopy skills were not good enough for most of the participants. 90% of participants were not able to pick major pathologies e.g. DR and HTN. Though 71% of participants agreed to statement that they need to examine more than 5 retina per week in their normal practice and 17% said that they need to examine fundus in more then 10 patients per week for which they need to refer the patient to ophthalmologist.

OPHTHALMOSCOPY WORKSHOP QUESTIONNAIRE		
Question:	Yes	No
Do you know basic of ophthalmoscopy?	69%	31%
Can you perform distant direct ophthalmoscopy?	35%	65%
Can you perform near direct ophthalmoscopy?	39%	61%
Can you focus the disc?	29%	71%
Can you recognize major pathologies of retina (papilledema, HTN Retinopathy, diabetic retinopathy) etc.	10%	90%
How frequently you need ophthalmoscopy in your clinical practice? > 5 time a week > 10 times a week >15 times a week	71% need this skill > 5 times a week	

Discussion

Ophthalmoscopy is a procedure with which we can see the retina. There are 02 major types of ophthalmoscopy, one is direct ophthalmoscopy and other is indirect ophthalmoscopy. In direct ophthalmoscopy we can see the retina directly with the ophthalmoscope, while in indirect ophthalmoscopy we use additional lens to focus the image of retina. Direct ophthalmoscopy is easy to learn as compare to indirect ophthalmoscopy which needs a lot of experience and learning curve is long.

Direct ophthalmoscopy is underutilized way of examination despite the fact that ocular examination is the major component of general physical examination. In a survey of physicians practicing in hospital conducted by Robert E et al, all participants agreed that ophthalmoscopy is important but only 03 out of 72 performed it in routine.⁷ In another study participants

responded with “never” option when asked how many times they had examined the fundus during last year.¹ This is very much comparable to our results in which 17% of participants agreed that they get more than 10 patients per week in which fundus examination is needed but 71% of participants could not perform ophthalmoscopy so, they need to refer all those patients to ophthalmologist. In another study done by Nichol DJ et al, when patient were asked to recall examination made with ophthalmoscope and stethoscope, nearly half of the patients could not recall to be examined with ophthalmoscope and 95.7 % recalled being examined with stethoscope.¹⁵ These studies not only show is adequate use of ophthalmoscope but also indicate poor performance when ophthalmoscopy is used. Most of the primary care physicians and postgraduate trainees are unable to do screening with ophthalmoscopy. In our study 65% of participants responded that they cannot perform distant direct ophthalmoscopy, 61% responded that they cannot perform near direct ophthalmoscopy and 71% responded with ‘No’ option for question regarding focusing the disc, which shows a huge number regarding the poor ophthalmoscopy skills in our participant doctors. Similar results were shown by survey done by program directors medicine and pediatrics residency program, in which they mentioned that less than 50% of their residents meet the minimum level of competence for ophthalmoscopy set by AUPO.¹⁶ Another study shows that less than 50% of hospital interneers correctly diagnosed retinal abnormalities with help of direct ophthalmoscope.⁷ Which is nearly similar to our results in which 90 % of the participants were not able to pick retinal abnormalities e.g hypertensive retinopathy and DM retinopathy. Another study done in UK showed that 43% of general physicians were not confident in using direct ophthalmoscope.¹⁷

Because of poor skills of direct ophthalmoscopy and lack of confidence in general practitioners, number of other ways are being developed to enhance learning and to improve screening. Fundus photograph can be one of the other modalities used as alternative to direct ophthalmoscope. Indeed, FOTO-ED study showed that not physician’s emergency department could be trained to obtained high quality fundus photograph using ocular fundus camera, and both staff and patients rated the technique as both comfortable and fruitful.¹⁸ It also helped physicians in interpretations of retinal findings as compared to direct ophthalmoscope.¹⁹

Though with new technologies and artificial intelligence the screening purpose for retinal pathologies become easier but it cannot replace the basic skills needed for diagnosing and managing retinal diseases. Direct ophthalmoscopy should be taught and learnt as basic skill to all undergraduate medical students, to enhance the learning of this basic skill and to equip our future doctors with this important diagnosing tool. Direct ophthalmoscopy can be used as quick tool by pediatrician, physician, gynecologist, emergency doctor and so on for diagnosing and proper referral of patients to see consultation. Most of the calls send by different specialties attended by ophthalmologist for opinion regarding retina in our setup shows normal retinal findings which is a wastage of time and energies of ophthalmologist. By improving the basic skills of ophthalmoscopy we can improve the referral protocols as well. This can improve the standards of patient care and can save the precious time of ophthalmologist to focus on special tasks to be served by ophthalmologist only.

Conclusion

Direct ophthalmoscopy is simple and important skill to be learned for improves clinical practices. This is much underused tool, which can help a lot to make diagnosis and manage accordingly in time. Every medical student should know the basic skills of ophthalmoscopy to make him/her a better future physician.

Limitation of this study was a small sample size and short duration of study. For more valuable results we need a longer workplace based assessment of a larger population working in different department of this institute.

References

1. Morad Y, Barkana Y, Avni I, Kozer E. Fundus anomalies: what the pediatrician’s eye can’t see. *Int J Qual Health Care*. 2004; 16(5):363–365. [PubMed: 15375096]
2. Hitchings RA. Visual disability and the elderly: time for general practitioners to begin preventive screening. *BMJ*. 1989; 298(6681):1126–1127. [PubMed: 2500159]
3. Mottow-Lippa L. Ophthalmology in the medical school curriculum: reestablishing our value and effecting change. *Ophthalmology*. 2009; 116(7):1235–1236. [PubMed: 19576494]
4. Association of American Medical Colleges Task Force on the Preclerkship Clinical Skills Education of Medical Students. [Accessed June 6, 2013.] Recommendations for preclerkship clinical skills education for undergraduate medical education. Available at https://www.aamc.org/download/163788/data/recommendations_for_preclerkship_skills_education_for_uugme.pdf

5. International Task Force on Ophthalmic Education of Medical Students. [Accessed June 6, 2013.] Principles and guidelines of a curriculum for ophthalmic education of medical students. Available at <http://icoph.org/dynamic/attachments/resources/icocurricmed.pdf>
6. Bruce BB, Lamirel C, Wright DW, et al. Nonmydriatic ocular fundus photography in the emergency department. *N Engl J Med*. 2011; 364(4):387–389. [PubMed: 21268749]
7. Roberts E, Morgan R, King D, Clerkin L. Funduscopy: a forgotten art? *Postgrad Med J*. 1999; 75(883):282–284. [PubMed: 10533632]
8. Klein BE. Overview of epidemiologic studies of diabetic retinopathy. *Ophthalmic Epidemiol*. 2007;14(04):179–83. 17896294. <https://doi.org/10.1080/09286580701396720>.
9. IDF. International Diabetes Federation Diabetes Atlas - Eighth Edition - 2017. <http://www.diabetesatlas.org/resources/2017-atlas.html>. Accessed 10 June 2018.
10. Lin S, Ramulu P, Lamoureux EL, Sabanayagam C. Addressing risk factors, screening, and preventative treatment for diabetic retinopathy in developing countries: a review. *Clin Exp Ophthalmol* 2016;44(4):300–320. PMID: 26991970. DOI: <https://doi.org/10.1111/ceo.12745>
11. Mapa Mudiyansele Prabath Nishantha Piyasena, Jennifer L. Y. Yip, David MacLeod, Min Kim et al. Diagnostic test accuracy of diabetic retinopathy screening by physician graders using a hand-held non-mydriatic retinal camera at a tertiary level medical clinic. *BMC Ophthalmology* (2019) 19:89 <https://doi.org/10.1186/s12886-019-1092-3>
12. Adriono G, Wang D, Octavianus C, Congdon N. Use of eye care services among diabetic patients in urban Indonesia. *Arch Ophthalmol*. 2011;129(7): 930–5. 21746983. <https://doi.org/10.1001/archophthalmol.2011.147>.
13. Burgess PI, Msukwa G, Beare NA V. Diabetic retinopathy in sub-Saharan Africa: meeting the challenges of an emerging epidemic. *BMC Medicine*. 2013;11(1):157. PMID: 23819888 PMCID: PMC3729714 DOI: <https://doi.org/10.1186/1741-7015-11-157>
14. Muecke JS, Newland HS, Ryan P, Ramsay E, Aung M, Myint S, et al. Awareness of diabetic eye disease among general practitioners and diabetic patients in Yangon, Myanmar. *Clin Exp Ophthalmol*. 2008;36(3):265–73. 18412597. <https://doi.org/10.1111/j.1442-9071.2008.01724.x>
15. Nicholl DJ, Yap CP, Cahill V, Appleton J, Willetts E, Sturman S. The TOS study: can we use our patients to help improve clinical assessment? *J R Coll Physicians Edinb*. 2012; 42(4):306–310. [PubMed: 23240115]
16. Stern GA. Teaching ophthalmology to primary care physicians. *Arch Ophthalmol*. 1995; 113(6): 722–724. [PubMed: 7786211]
17. Shuttleworth GN, Marsh GW. How effective is undergraduate and postgraduate teaching in ophthalmology? *Eye (Lond)*. 1997; 11(5):744–750. [PubMed: 9474330]
18. Bruce BB, Lamirel C, Biousse V, et al. Feasibility of nonmydriatic ocular fundus photography in the emergency department: phase I of the FOTO-ED study. *Acad Emerg Med*. 2011; 18(9):928–933. [PubMed: 21906202]
19. Bruce BB, Thulasi P, Fraser CL, et al. Diagnostic accuracy and use of nonmydriatic ocular fundus photography by emergency physicians: phase II of the FOTO-ED study. *Ann Emerg Med*. 2013.01.010 [10.1016/j.annemergmed.2013.01.010](https://doi.org/10.1016/j.annemergmed.2013.01.010)