

Ophthalmology residency training in India: Comparing feedback about how the training equips ophthalmologists to combat retinal diseases. READS report #6

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Purpose: To document whether the residency training in management of retinal diseases has improved in 2000s to meet the increasing demand of retina care in India. **Methods:** A survey, using a prevalidated questionnaire, was conducted by Academic and Research Committee (ARC) of the All India Ophthalmological Society (AIOS) in 2014–2016 among ophthalmologists to document teaching of retina-related clinical and surgical skills in the postgraduate residency program. **Results:** The 144-item questionnaire was mailed to 4512 practicing ophthalmologists with residency training in two different periods, between 1967 and 2000 (group 1; 20th-century trained) and between 2003 and 2012 (group 2; 21st-century trained). Response was received from 320 (19.1%) of group 1 ophthalmologists and 531 (18.7%) of group 2 ophthalmologists. The average age was 49.2 ± 8.7 and 32.6 ± 4 years, respectively. Group 2 residents had received superior training in indirect ophthalmoscopy, slit lamp biomicroscopy using +78 and +90D lens, optical coherence tomography, fundus photography, and fluorescein angiography (all $P < 0.001$), but there was large variation between the training institutions. The residents were not taught vitreous and retinal detachment surgeries in either period of training. **Conclusion:** Teaching of retina-related clinical skills have improved in Indian residency program, but there are variations across programs. This information might help redesign the ophthalmology residency programs to meet the demands of comprehensive eye care and universal health coverage of increasing retinal diseases in India.

Key words: Diabetic retinopathy, India, residency training, retina

Improved surgical services and better control of infections, improved nutrition, and easier availability of antibiotics have reduced blindness related to cataract and corneal disorders in India.^[1-3] There is a large epidemiological transition toward noncommunicable and lifestyle diseases such as diabetes mellitus, hypertension, and obesity in India.^[4] The retinal disorders contribute significantly to ocular morbidity and visual impairment due to increased prevalence of these diseases coupled with an aging population and increased life expectancy.^[5,6] Diabetic retinopathy (DR) and age-related macular degeneration (AMD) together share 5.26% of global burden of blindness and moderate to severe visual impairment.^[7] Hence, it is necessary that the basic training is offered in ophthalmology residency to diagnose common retinal diseases for appropriate treatment and referrals. Today, a sizable number of people attend the out-patient clinic with retinal diseases. Hence, it needs to equip ourselves with infrastructure and knowledge. The current survey was conducted to assess our knowledge preparedness at the ophthalmology residency training to meet the growing demand. The survey assessed the

practicing ophthalmologists trained before and after 2002 to understand the changes, if any, in the ophthalmology residency training in India.

Methods

The Academic and Research Committee (ARC) of the All India Ophthalmologists Society (AIOS) had commissioned a survey to assess the skill transfer during the residency programs from ophthalmologists trained before and after 2000 AD (pre millennium 1967–2000, group 1; and post millennium 2002–2014, group 2).^[8,9] A semi-structured questionnaire was emailed and posted to all the participants [Questionnaire].^[8,9] The questionnaire was part of a SurveyMonkey link with a forwarding letter requesting the respondents about what was expected from them. A postal, email, and telephonic reminder were sent each week. The participants were requested to enter certain demographic details (year and place of residency training); disclosure of personal identity was optional. Additional questions included questions related to learning of clinical examination skills and surgeries (observed or assisted or performed). The specific retinal training included assessment

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of clinical skills (direct and indirect ophthalmoscopy, slit lamp biomicroscopy using +78 or +90 D lens, fundus photography, fluorescein angiography, optical coherence tomography, and B-scan ultrasonography), noninvasive treatment skill, specifically use of retinal laser, and vitreoretinal surgery (observe, assist, perform). The skills were graded between 0 (not taught at all) and 10 (taught comprehensively). We used nonparametric test and Wilcoxon sign-rank test to find the significant change between the two groups.

Results

The questionnaire were sent to 4512 ophthalmologists and 1005 responded, but only 851 (18.8%) responses were complete and valid; 320 of 1672 (19.1%) ophthalmologists were from group 1 and 531 of 2840 (18.7%) ophthalmologists were from group 2. Group 2 ophthalmologists were obviously younger, but there were less number of female ophthalmologists in group 1. More number of residents were trained in public medical colleges in group 1 [Table 1]. Table 2 shows the comparison between the two groups for retina-related clinical skill teaching.

The results show that except for direct ophthalmoscopy, the ophthalmologists trained after 2002 reported superior exposure to skills in retinal diagnostics and laser. The post-2002 trained ophthalmologists had performed more number of vitrectomies [average 5.7 (standard deviation (SD) 20) cases vs 3.1 (SD 17)] and pre-2002 ophthalmologists had performed more number of retinal detachment surgeries [5.9 cases (23.2) vs 1.5 cases (SD 12.5)] during their basic residency training. For both groups and both types of surgeries, however, the median

value was 0, and the range was 0 to > 100 surgeries. The wide SDs suggested extreme variability in various residency training programs. Most programs did not offer vitreous or retina surgical training to their residents. The prior to 2002 residency programs did not teach optical coherence tomography and retinal LASER; unfortunately, the training in retina LASER was still inadequate in post-2002 residency training programs.

Table 3 shows the surgical exposure to retina amongst residents in government medical colleges, nongovernmental organization (NGO) hospital programs, private institute programs, and private medical colleges. Government medical colleges gave the best exposure before the year 2000, while NGO hospitals and government medical colleges gave the best in the past decade.

Discussion

It is no denying that with increasing burden of retinal disorders, all ophthalmologists must be trained in diagnosing and possibly medically treating common retinal conditions such as DR and AMD. Leaving all the patients to only fellowship-trained retina specialist is no more an option. Hence, the basic training imparted at the residency level bears this new responsibility. This survey assessed the status of and change in the residency training in ophthalmology over years in India. The period was divided into two, a three-decade period of 1967–2000 and one-decade period of 2002–2014. This division of period was made with few transitions in chronological time and the development of ophthalmology in India. The chronological time was the historical march from 20th to 21st century. The Indian ophthalmology transition was the strategic planning and execution of the then most blinding condition in India, cataract,^[10] so that the Indian ophthalmologists could suggest a change in policy to change the focus away from cataract.^[11]

In the recent years, the retinal disorders, particularly DR and AMD, are on the rise^[7] although many treatment options are available today than ever before. We have thus the opportunity and challenge; the opportunity of curing many hitherto untreatable conditions, and the challenge of deploying a large number of skilled eye health personnel and technology. The medical teaching in India is mostly “in-person” model in which the “apprentice” learns from the “master.”^[12] The teaching is both teacher- and institute-dependent; this results in a large variation in training even though a broad framework for training is available. A standardized curriculum with

Table 1: Demography of ophthalmologists in groups 1 and 2

Demography points	Group 1 1967-2000 n=320	Group 2 2002-2014 n=531
Age	49.2±8.7	32.6±4.0
Gender (female)	75 (23.4%)	206 (38.8%)
Type of training institution		
Public medical college	238 (77.5%)	304 (57.3%)
Private medical college	30 (9.7%)	90 (16.9%)
Not-for-profit eye hospital	29 (9.5%)	60 (11.3%)
For-profit eye hospital	10 (3.3%)	77 (14.5%)

Thirteen respondents in group 1 did not specify. Hence, calculation is made from 307 respondents only

Table 2: Clinical skills teaching in two time periods

Clinical skills	Group 1, n=320 1967-2000		Group 2, n=531 2002-2014		P
	Mean (SD)	Median	Mean (SD)	Median	
Direct ophthalmoscopy	7.5 (2.7)	8	7.4 (2.8)	8	0.829
Indirect ophthalmoscopy	4.6 (3.4)	4	6.2 (3.3)	7	<0.001
Slit lamp biomicroscopy (+78/+90 D)	3.8 (3.8)	3	6.8 (3.2)	8	<0.001
Fundus photography	3.7 (3.7)	2	4.6 (4.0)	5	<0.001
Fluorescein angiography	3.7 (3.6)	3	5.4 (3.5)	5	<0.001
Ultrasonography	3.9 (3.7)	3	5.4 (3.6)	6	<0.001
Optical coherence tomography	1.7 (3.1)	0	4.6 (4.0)	5	<0.001
Retina laser	2.3 (3.3)	0	3.1 (3.5)	1	<0.001

SD=Standard deviation, 0=Not taught; 10=Taught well

Table 3: Comparison of surgical training imparted depending on the type of institute where residency was done

Operated independently	Government		Nongovernment		Private hospital		Private medical college		P
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
20 th -century trained									
Retinal detachment surgery	7.0	25.9	4.0	13.6	2.0	4.5	0.3	1.1	0.303
Vitreotomy	6.4	21.9	6.3	14.8	2.0	4.5	1.0	2.8	0.836
21 st -century trained									
Retinal detachment surgery	2.6	16.4	0.3	1.3	0.1	0.6	0.0	0.1	0.029
Vitreotomy	4.0	19.5	5.0	24.4	1.3	3.7	0.2	0.8	0.036

SD=Standard deviation

comparable outputs or a board certification is now available for some post-residency fellowship programs. These programs focus on improving the surgical and diagnostic skills, and some programs also include clinical research competencies.

The current transition toward noncommunicable diseases (NCD) will result in a larger pool of people requiring eye examinations. Reports from Europe suggest that the number of patients seeking care for retinal diseases is likely to increase exponentially in the coming decades.^[13,14] Australian studies have shown AMD to be a significant contributor to blindness and visual impairment in Australian population.^[15] This in turn demands increased proficiency in retinal diagnosis and treatment.^[16] The high prevalence of diabetes in India can translate into a large number of people with DR. Persons with DR require frequent follow-up retinal examinations increasing the greater demand for a specialized eye examination. Considering the potentially large number of people with diabetes who may need eye examinations, ophthalmologists have to become familiar with basic retinal diagnostic examinations including ophthalmic ultrasound, fluorescein angiograms, fundus photography, and the use of LASERs for the medical management of retinal disorders. Our study shows an improved exposure to medical retina procedures and diagnostics, although the large SDs indicate the disparity in teaching and training. Unfortunately, this trend is not seen in learning of retinal laser. Government medical colleges gave the best exposure before the year 2000, while NGO hospitals and government medical colleges gave the best in the past decade. The current ophthalmology residency training program needs a revision and standardization to include adequate training to treat the common NCDs' manifesting in the eye.

Earlier publications from India had documented the uneven nature of residency training.^[17-20] Residency programs in Hong Kong and China also allowed only very limited surgical exposure to the trainees.^[21] Indian residency program needs revision and restructuring similar to the ones in Canada and the United States.^[22-24] Considering the limited time, we understand that surgical training in vitreoretinal disorders is not possible during the residency, but it could be initiated with wet labs and virtual and/or augmented reality training.

A self-reported questionnaire was used for this study. It is possible that answers are subject to recall bias and individual preferences or perceptions regarding their training. The questions only assess exposure to specific elements and do not explore whether respondents have translated any competencies

into practice and be prone to recall bias and subjectivity. There may be a floor and ceiling effect in replying to the questions.

Conclusion

Teaching of retina-related clinical skills have improved in Indian residency programs over the years, but there is gross variation in the quantity and quality of training across the programs. This information might help redesign ophthalmology residency programs to meet the demands of comprehensive eye care and universal health coverage of retinal diseases in India.

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Conflicts of interest

There are no conflicts of interest.

References

- Venkataswamy G. Cataract in the Indian subcontinent. *Ophthalmic Surg* 1987;18:464-6
- Minnassian DC, Mehra V. 3.8 million blinded by cataract each year: Projections from the first epidemiological study of incidence of cataract blindness in India. *Dr. J Ophthalmol* 1990;74:341-3.
- Neena J, Rachel J, Praveen V, Murthy GV. Rapid assessment of avoidable blindness in India. *PLoS ONE* 2008;3:e2867.
- Flaxman SR, Bourne RRA, Resnikoff S, Ackland P, Braithwaite T, Cicinelli MV, *et al.* on behalf of the Vision Loss Expert Group of the Global Burden of Disease Study. Global causes of blindness and distance vision impairment 1990–2020: A systematic review and meta-analysis. *Lancet Glob Health* 2017;5:e1221-34.
- Raman R, Gella L, Srinivas S, Sharma T. Diabetic retinopathy: An epidemic at home and around the world. *Indian J Ophthalmol* 2016;64:69-75.
- Patil SA, Gogate P, Vora S, Ainapure S, Hingane RN, Kulkarni AN, *et al.* Prevalence and causes of blindness and cataract surgical services in Sindhudurg district on west coast of India. *Indian J Ophthalmol* 2014;62:240-5.
- International Agency for Prevention of Blindness Vision Atlas 2017. Available from: www.atlas.iapb.org. [Last accessed on 2019 Jan 12].
- Gogate PM, Biswas P, Natarajan S, Ramamurthy D, Bhattacharya D, Golnik K. Residency evaluation and adherence design study: Young ophthalmologists' perception of their residency programs; clinical & surgical skills. *Indian J Ophthalmol* 2017;65:452-60.
- Biswas P, Gogate PM, Maskati QB, Natarajan S, Verma L, Bansal P. Residency evaluation and adherence design study III: Ophthalmology residency training in India: Then and now; improving with time? *Indian J Ophthalmol* 2018;66:785-92.
- Jose R, Bachani D. World bank-assisted cataract blindness control project. *Indian J Ophthalmol* 1995;43:35-43.

11. Dandona L, Dandona R, Naduvilath TJ, McCarty CA, Nanda A, Srinivas M, *et al.* Is current eye-care-policy focus almost exclusively on cataract adequate to deal with blindness in India? *Lancet* 1998;351:1312-6.
12. Mendis L, Adkoli BV, Adhikari RK, MuzaherulHaq M, Qureshi AF. Postgraduate medical education in South Asia. *Br Med J* 2004;328:779-81.
13. Keuneu JEE, Anton Verezenc, Imhof SN, Van Rens GH, Asselbergs M B, Limburg H. Toe name in dev v raagnaaroozorg in Nederland. *Ned TidschrGeneesk* 2011;155:A3461.
14. Limburg H, Keunen JEE. Blindness and lowvision in the Netherlands from 2000 to 2020 – Modelling as a tool for focused intervention. *Ophthalmic Epidemiol* 2000;16:362-9.
15. Nguyen V, Daien V, Guymea RH, McAllister H, Morlet N, Barthelmes D, *et al.* Clinical and social characteristics associated with reduced visual acuity at presentation in Australian patients with neovascular age related macular degeneration: A prospective study from a long-term data set. *The Fight Retinal Blindness! Project. Clin Exp Ophthalmol* 2018;46:266-74.
16. Dhawan B. Inclusion of basic vitreo-retina training in Indian ophthalmology residency programs – Need of the hour! *Educ Health (Abingdon)* 2015;28:106.
17. Thomas R, Dogra M. An evaluation of medical college departments of ophthalmology in India and change following provision of modern instrumentation and training. *Indian J Ophthalmol* 2008;56:9-16.
18. Grover AK. Postgraduate ophthalmic education in India: Are we on the right track? *Indian J Ophthalmol* 2008;56:3-4.
19. Murthy GV, Gupta SK, Bachani D, Sanga L, John N, Tewari HK. Status of specialty training in ophthalmology in India. *Indian J Ophthalmol* 2005;53:135-42.
20. Gogate P, Deshpande M, Dharmadhikari S. Which is the best method to learn ophthalmology? Resident doctors' perspective of ophthalmology training. *Indian J Ophthalmol* 2008;56:409-12.
21. Young AL, Jhanji V, Liang Y, Congdon N, Chow S, Wang F, *et al.* A survey of perceived training differences between ophthalmology residents in Hong Kong and China. *BMC Med Educ* 2015;15:158.
22. Le K, Bursztyn L, Rootman D, Harissi-Dagher M. National survey of Canadian ophthalmology residency education. *Can J Ophthalmol* 2016;51:219-25.
23. Binenbaum G, Volpe NJ. Ophthalmology resident surgical competency: A national survey. *Ophthalmology* 2006;113:1237-44.
24. McDonnell PJ, Kirwan TJ, Brinton GS, Golnik KC, Melendez RF, Parke DW 2nd, *et al.* Perceptions of recent ophthalmology residency graduates regarding preparation for practice. *Ophthalmology* 2007 Feb; 114:387-91.

Questionnaire Used in the Study

All India Ophthalmology Society

Academic and Research Committee

Improving Residency training and Basic Competency Program

Basic Competency in Young Ophthalmologists

Name:

Gender:

Age:

Geographic location:

AIOS Number (if member): Not a member

Education

MBBS from:

Was ophthalmology the first choice of career?

Top choice

One of the 3 top choices

Not amongst the first three choices

Ophthalmology residency from:

When started, completed

Type of institution

1. Where did you pass from?
Medical College, Non-Govt Organ Hospital
Corporate hospital, Pvt Eye Hospital
Pvt Medical College
2. The institution you passed from was set in a
Metro city Large town
District headquarters Any other/smaller town
3. You have done your
MD MS DNB DO
4. Number of years since you passed the exit exam ----- years

Your residency training:

5. Did you learn/were you taught the following out-patient skills needed for your practice?

Refraction
Slit-lamp examination
Direct ophthalmoscopy
Squint/orthoptic evaluation
Applanation tonometry
Gonioscopy
+78/+90 D
Indirect ophthalmoscopy
Keratometry
Pediatric visual acuity testing

6. Were you adequately exposed to the following diagnostic tests?

Automated perimetry
Fundus photography
Pachymetry
Fluorescein angiography
Optical coherence tomography
A-scan biometry
B-scan ultrasonography
Synoptophore
Hess diplopia charting

7. Were you taught contact lens evaluation?

8. Were you adequately exposed to?

Nd: YAG LASER capsulotomy
Double frequency YAG LASER

9. Did you perform the following surgeries?

Manual small incision cataract surgery
Conventional ECCE
Phacoemulsification
Trabeculectomy
Strabismus correction
Pterygium excision
Dacryocystectomy
Dacryocystorhinostomy
Chalazion incision and drainage
LASIK, refractive surgery
Retinal detachment surgery
Vitrectomy
Keratoplasty
Lid surgeries
Managing ocular emergencies

10. Were you exposed to the following?

Eye banking
Community eye care

11. On what topic was your dissertation?

Was the dissertation presented at a local, state, national conference? Published?
Who did the presentation at each level?
Was it in oral or poster format?
Did you seek an ethics committee approval?
Were you well versed with research methodology at the end of it?

12. Taught program – the academic schedule

Didactic lectures
Seminars
Case presentations
Journal club
Wet lab

After the residency

Any additional training acquired

Fellowship?

Which sub-speciality

Where do you plan to practice?

Metro Large city Small city Taluka Village

What type of practice?

Govt NGO hospital Teaching institution Solo Pvt practice Group practice

Is spouse a doctor, optometrist?

Are you from a family of ophthalmologist?

Why did you choose this sub-speciality/comprehensive ophthalmology?

Career

Money

Knowledge

Personal profile

Would you provide some profile of yours?

Name (optional):

Age:

Gender:

First language (, other tongue):

Was the residency training held in a state with a different language than yours?

Did you face any problems communicating with the patients?

Are you a first-generation medical professional?

Married?

Having children?