The Accuracy, Quality and Timing of Referrals to the Ophthalmology Division at the University Hospital of the West Indies

M Chin[1], L Mowatt[1, 2]

ABSTRACT

Objective: To determine the accuracy, quality and timing of ophthalmic referrals.

Design: This was a prospective study. The data was collected using a pro forma. All patients gave voluntary written consent.

Setting: The Ophthalmology Division at the University Hospital of the West Indies

Participants: All new patients referred to the Ophthalmology Division from August 3, to November 3, 2016. It excluded patients referred for disease screening.

Result: There were 207 patients recruited, 114 (55%) males and 93 (45%) females, aged four months – 87 years (Mean age 45.4years, SD 20.8). The majority were from general practitioners (33%), followed by ophthalmologists (28%) and emergency physicians (23%). The most common conditions were glaucoma (12%), cataract (10%) and uveitis (10%). Only 20% of referrals contained all four referral elements - history, examination, visual acuity and diagnosis. Ophthalmologist referrals were most accurate (89%), while general practitioners (29%) were least accurate. Mean time from referral to the patient presenting to the eye clinic and being seen was 82 days for routine and 4.2 days for emergent/urgent referrals. There were 41 adverse events (19.8%); delays due to physician factors (inappropriately written referrals, inappropriate medications used or lack of disease screening) or patient factors including prolonged time to presentation.

Conclusion: There is a high-rate of poorly written referrals and inaccurate diagnoses. Inadequate communication, poor timing of referrals, inaccurate diagnosis and treatment affect patient outcomes. With standardized referrals, patient morbidity may be reduced.

Keywords: General practitioners, hospital, primary care, referral, ophthalmologist, ophthalmology, optometrists, Jamaica

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From: [1]Ophthalmology Division, University Hospital of the West Indies, Mona, Jamaica, West Indies and [2]Department of Surgery, Anesthesia, Radiology and Intensive Care, Faculty of Medical Sciences, University of the West Indies, Mona, Jamaica.

Correspondence: Dr Lizette Mowatt, Consultant Ophthalmologist, Faculty of Medical Sciences, The University of the West Indies, Mona Institute of Medical Sciences, Mona, Kingston 7, Jamaica, West Indies. Email: lizettemowatt@yahoo.com

INTRODUCTION

The initial management of acute ophthalmic pathology can have a significant impact on a patient's outcome. Proper management and ophthalmic referral is dependent on a physician's ability to recognize ophthalmic conditions and institute the appropriate treatment or refer to an ophthalmic service in an appropriate time frame. Misdiagnosis, mismanagement or delay in referral all contribute negatively to a patient's outcome.

The University Hospital of the West Indies is a tertiary healthcare facility in Jamaica [population ~2.8million] (1). Hospital Ophthalmology services are only found in the two cities (Kingston and Montego Bay) and one large town in the island. Most primary care in ophthalmology in the rural setting is done by general practitioners and ophthalmologists. The Ophthalmology Division receives emergent, urgent and routine referrals from primary healthcare professionals such as general practitioners, emergency department physicians, optometrists, as well as from hospital based doctors and ophthalmologists from the city and rural areas.

Written referrals are brought in by patients, the referrals are assessed and then patients may be seen immediately or given a clinic date. The adequate content of referrals is necessary to facilitate this triage process. It also aids in the diagnosis and treatment of patients, who may not recall details of their prior management. This makes communication an important quality and safety issue.

There are some eye conditions which are relatively common and when uncomplicated do not require referral to the ophthalmology service. In addition, patients are referred from across Jamaica for conditions that could be managed at other ophthalmology services in closer proximity to patients. These circumstances contribute to the overburdening of the busy ophthalmology service

and also result in inefficient use of time and resources to both the hospital service as well as to patients.

There were no previous studies in Jamaica to assess the pattern, quality, or timing of ophthalmology referrals, nor to assess accuracy of diagnoses between referral groups.

This study will assess the standard of our current practice. The aim is to determine the accuracy, quality and timing of ophthalmic referrals, improve the quality and appropriateness of referrals and therefore, improve the standard of patient care by improving the quality of ophthalmic referrals. With standardized referrals, patient morbidity may be reduced.

SUBJECTS AND METHOD

Participants

This was a prospective study on new patients referred to the Ophthalmology Division from August 3, to November 3, 2016. It excluded patients who were already followed-up in the outpatient department and those referred for disease screening without an eye complaint.

Ethical Approval

Ethical approval for the study was obtained by the University of the West Indies, Faculty of Medical Sciences Ethics Committee and was therefore, performed in accordance with the ethical standards laid down in the Declaration of Helsinki, Brazil, October 2013.

Measurements

A pro forma was filled out by the researcher using data from the patients' referral notes and dockets. This included the patient code, age, gender, the source of the referral (general practitioner,

emergency department physician, ophthalmologist, optometrist, hospital doctor), the nature of the referral (routine, urgent/emergent), the referral contents (history, visual acuity, examination, diagnosis, the time of referral and the time seen in the ophthalmology clinic, the diagnosis and treatment from the referring doctor and the diagnosis and treatment given in the ophthalmology clinic. Confidentiality and anonymity was maintained.

Statistical analyses

SPSS Statistics 19.0.0 was used for data analysis.

RESULTS

There were 207 patients recruited into the study, 114 (55%) males and 93 (45%) females, aged 4 months – 87 years (Table 1). The majority (33%) were from general practitioners, followed by ophthalmologists (28%) and emergency physicians (23%). Hospital doctors and optometrists accounted for 12% and 4%, respectively. The most common conditions were glaucoma (12%), cataract (10%) and uveitis [10%] (Table 2).

Table 1: Patient demographics (n = 207).

Characteristic	**Number**	**Percentage**
Gender		
Male	110	55%
Female	97	45%
Age (years)		
0−18	22	11%
19−34	44	21%
35−65	108	52%
Over 65	33	16%

Table 2: Ten most common ophthalmic diagnoses.

Diagnosis	**Cases (n = 207)**	**Percentage**
Glaucoma	24	12%
Cataract	19	10%
Uveitis	19	10%
Diabetic retinopathy	18	9%
Retinal detachment	11	6%
Pterygium	7	4%
Refractive error	7	4%
Vitreous haemorrhage	6	3%
Corneal foreign body	5	3%
Lid laceration	5	3%

Only 20% of referrals contained a history, examination, visual acuity and diagnosis (Fig. 1).

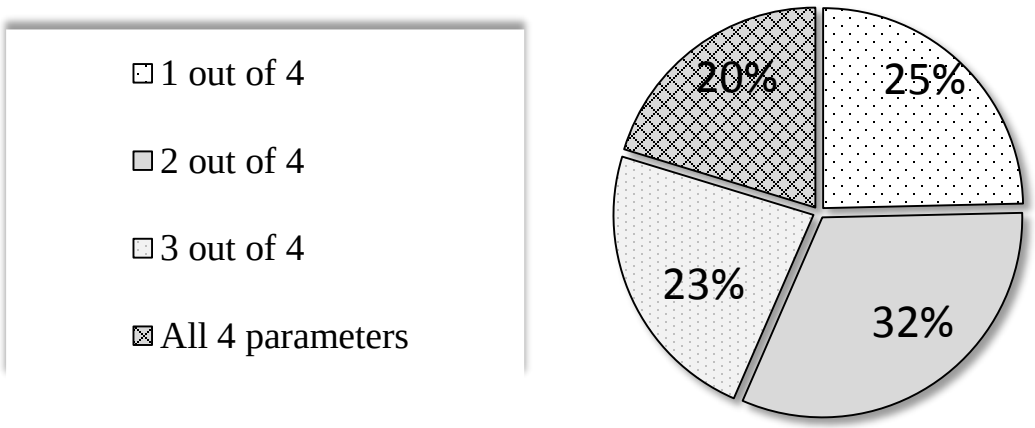
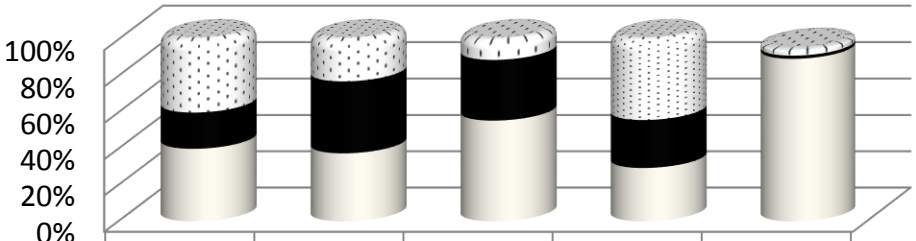


Figure 1. Referral quality - Number of Parameters in Referral (History, Visual acuity, Examination, Diagnosis)

Ophthalmologist referrals were most accurate (89%), while general practitioners (29%) were least accurate (Fig. 2). This was statistically significant ($p < 0.0005$). Mean time to be seen was 82 days for routine and 4.2 days for emergent/urgent referrals.



	Hospital (n=25)	ER (n=48)	Optom (n=9)	GPs (n=68)	Ophthal (n=57)
No Diagnosis	40%	23%	11%	44%	4%
Incorrect	20%	40%	33%	26%	2%
Correct	40%	38%	56%	29%	89%

Fig. 2. Accuracy of Diagnosis by Referring Doctors

*$p = 0.001$. †Hospital = hospital based doctors, ED = emergency department physicians, Optom = optometrists, GPs = general practitioners, Ophthal = Ophthalmologists

There were 41 adverse events, which included delays due to poor quality referrals or prolonged time to presentation, lack of prior disease screening, and use of inappropriate medications (Table 3).

Table 3: Adverse events.

Adverse event	**Number**	**Percentage**
Delay in referral	4	10%
Delay in presentation	12	29%
Inappropriate referral	9	22%
Lack of disease screening	7	17%
Medication resulted in harm	1	2%
Missed important diagnosis	2	5%
Poor quality of referral resulted in a delay	3	7%
Unnecessary medication	3	7%

Inappropriate referrals were those that could be managed by a primary care physician or optometrist. A delay in presentation accounted for the majority (29%) of adverse events and was usually a result of problems with transportation with patients having to travel far distances.

There was one severe adverse event. This was the case of a 77-year-old female with a corneal perforation. She was referred one week after being prescribed steroid eye drops for a complaint of pain and foreign body sensation

DISCUSSION

There have been no previous studies in Jamaica to assess the pattern, quality, or timing of ophthalmology referrals, nor to assess accuracy of diagnoses between referral groups. Previous studies have demonstrated a difference in the accuracy of referrals between different sources (optometrists, emergency department physicians, general practitioners and hospital based doctors) and also that ophthalmic emergency services provided a large amount of primary care (2−4). They also showed that adverse outcomes occurred and were a result of misdiagnosis or mismanagement by the referring physician. The results of this study showed a high-rate of poor referrals and inaccurate diagnoses. The majority of referrals were from general practitioners who also had the least accurate referrals.

In a study by Yap *et al* it was determined that there was a statistically significant difference in the accuracy of referrals, with optometrists (75.8%) and emergency department physicians (64.6%) being more reliable in their diagnoses compared to general practitioners (46.8%) and hospital based doctors [23.9%] (2). Statham *et al* also found that general practitioners were less

likely to have accurate referrals (35.9%) compared to optometrists (48.2%) and emergency physicians [41.9%] (3). General practitioners have been found to have poor quality referrals, with only 16.4% of the 335 referrals containing visual acuity and 49.9% containing any examination findings (4). This could reflect the need for more time and emphasis on ophthalmology at the undergraduate medical education level.

In this study, 9 out of 41 adverse events (22%) were due to referrals for that could have been managed at the primary care level. It has been shown in previous studies that ophthalmic emergency services provided a large amount of primary care (3). This again could be due to lack of knowledge or lack of experience and confidence in dealing with eye conditions. All physicians should pay close attention to warning symptoms: pain, photophobia and blurred vision to assist in indicating the need for referral to an ophthalmologist. They should also be able to diagnose and manage common uncomplicated ophthalmic conditions.

The severe adverse event in this study could have possibly been prevented. Steroid eye drops should be prescribed with great care. It has been proposed by some authors that topical steroid prescription should be reserved for ophthalmologists (5). At the very least it may be useful to provide detailed guidelines for practitioners on prescription of these medications (6). Physicians making an accurate diagnosis in this case may be a limiting factor in implementing these guidelines.

Statham *et al* found that in 123 of 1062 patients (11.6%), there was an adverse outcome resulting from misdiagnosis or mismanagement by the referring physician (3). In most cases (74%), adverse outcomes were associated with misdiagnosis, while the others (26%) were a result of incorrect treatment or a delay in referral. From these referrals with adverse outcomes, 78% were from general practitioners, 17% from emergency department physicians and 5% from optometrists (2).

Education for all physicians should include the awareness of screening practices for ophthalmic disease. Seven out of 41 (17%) adverse events in this study were due to patients who were not referred for disease screening. A delay in presentation (29%) was mainly due to transportation issues. This could be reduced by expanding the availability of ophthalmic services throughout the island.

This study highlights the importance of communication in our busy work environments as physicians. All physicians throughout the world should be able to relate to and apply this concept. Inadequate communication, poor timing of referrals, inaccurate diagnosis and treatment affect patient outcomes. Standardized referrals may help to improve this and reduce patient morbidity. Electronic medical record referral tools also may assist us in communicating better by providing a guide to quality referrals.

There were some limitations in this study. In cases where inadequate information existed in a referral, patients would be required to self-report any treatment or procedure obtained prior to referral, which may have resulted in recall bias.

CONCLUSION

This study allows us to assess the standard of our current practice and emphasizes that communication *via* referrals is an important aspect of patient care. Most patients are referred from primary care physicians and are frequently misdiagnosed at the primary care level. There is often a delay between referrals and patients receiving care at the tertiary level. Future research would be needed to investigate the usefulness on methods to improve the referral system.

ACKNOWLEDGEMENTS

The research on which this publication is based would not be possible without the cooperation and assistance from the Ophthalmology Division staff at the University Hospital of the West Indies. We are grateful to Dr Jasneth Mullings for assisting with the use of SPSS in data analysis.

Author contributions

Dr Melissa Chin completed this research as part of her graduate studies in Ophthalmology at the University of the West Indies. She applied for and gained ethical approval through the University of the West Indies Faculty of Medical Sciences Ethics Committee. She analysed and interpreted data and drafted the manuscript. Dr Lizette Mowatt is the research supervisor. She had ongoing input throughout the research including design, data analysis and interpretation and revising the final manuscript. The authors declare that they have no conflicts of interest.

REFERENCES

1. Population Statistics of Jamaica by year (2011-2016) and gender. Available from http://statinja.gov.jm/demo_socialstats/newpopulation.aspx
2. Yap J, Guest, S, McGhee CN. Characteristics and accuracy of referrals to an acute tertiary ophthalmic service in New Zealand. Clinical & Experimental Ophthalmology 2015; **43:** 387–389. doi: 10.1111/ceo.12439
3. Statham MO, Sharma A, Pane AR. Misdiagnosis of acute eye diseases by primary health care providers: incidence and implications. Med J Aust 2008; **189:** 402–404.
4. Al-Arrayedh H, O'Doherty M, Murphy C, O'Reilly F. An Audit of Primary Care Referrals to the Ophthalmic Accident and Emergency Department of the Royal Victoria Eye and Ear Hospital, Dublin. Royal College of Surgeons in Ireland Student Medical Journal 2010; **3:** 25–28
5. Sheldrick JH, Wilson AD, Vernon SA, Sheldrick CM. Management of ophthalmic disease in general practice. The British journal of general practice: the journal of the Royal College of General Practitioners 1993; **43:** 459–62.
6. Lavin MJ, Rose GE. Use of steroid eye drops in general practice. Br Med J (Clin Res Ed) 1986; **292:** 1448–1450.