RESEARCH ARTICLE

ASSESSMENT OF THE CAUSES OF NON-TOLERANCE TO OPTICAL PRESCRIPTION IN TERTIARY CARE OPTOMETRIC PRACTICES

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ABSTRACT

Objective: To study non-tolerance to spectacle prescriptions in a tertiary eye care hospital. In recent years, there has been an increased emphasis in the healthcare services on clinical governance and on causes of adverse reactions. This study was an evaluation of non-tolerance cases in a large volume optometric practice. The main aim was to determine the most common reasons for a patient to return un-satisfied with their new spectacles. **Methodology**: The project was based at a busy community optometric practice in Dr Shroff's Charity Eye Hospital, Delhi., Prescription non-tolerance was defined as a patient who had collected spectacles from the optical, agreed to try them in their habitual environment, but had subsequently returned within 1 month because they were either having problems with, or were unable to wear, their new spectacles. If the non-tolerance persisted or the spectacle dispensing was felt to be correct, the patient was sent for a retest or non-tolerance examination with an optometrist. Where possible, this was arranged with the initial prescriber. **Inclusion criteria**: We were included those patients who were more than 18 years. The fitting of the frame, inappropriate type of lens (e.g. single vision bifocal or progressive addition lens), positioning of lens (e.g. bifocal at incorrect height) and wrong refraction were considered for study. **Exclusion criteria:** We were excluded those had pathological condition and developmental disabled. **Result:** A total of 5715 Spectacles dispensed during the 15 month study period. Of these, 47 were non tolerance examinations, which accounts for 0.82% with 95% CI LL 0.59% and with 95% CI UL 1.06% of eye examinations. **Conclusion:** In summary, non-tolerance examinations comprised a 0.7% of eye examinations. In a climate where clinical governance and auditing are increasingly important, an understanding of the norms for prescription non-tolerance can help optometrist to determine best practice.

INTRODUCTION

The healthcare industry has placed a greater emphasis on clinical governance and the causes of adverse reactions.(1) But it is surprising that not a handful studies are present on non-tolerance to optical prescriptions. Non-tolerances are a term used to describe adverse reactions to optical prescriptions. (2) In practise, high patient satisfaction with refractive correction is a critical goal since discontent can lead to a decline in the quality of the doctor-patient relationship, which in turn leads to a decrease in patient compliance and the quality of the outcome. When the expected optical performance, or the final appearance of the spectacles, does not meet the patient's expectations, the source of the problem must be discovered and handled in a timely and professional manner. Otherwise, the

A joyful outcome, on the other hand, may win the patient's long-term devotion, as well as that of their family and circle of friends, to whom they refer you. Spectacle intolerance can be categorised into two groups:

Dispensing non-tolerance: Dispensing non-tolerance refers to glasses that a patient finds difficult to tolerate and they return to the practitioner. An error is found either with the refraction process, the frame choosing, the lenses or the dispensing measurements taken. Normally, these types of cases have been deal by an optician. The main causes are incorrect refraction, incorrect frame fitting, optical centration problems, cosmetic reasons and miss-communication (3).

Prescription non-tolerance: Prescription non-tolerance was characterised as a patient who had picked up new spectacles

from the hospital optical, consented to try it out in their daily habitual setting, but then returned because they had problems with them or were unable to wear them. Dealing with intolerance to spectacle is a common everyday aspect for optometric practitioners. Basically, patients want to see as well as they also prefer to look as great as they can in their new fashionable eyewear. Being eye care practitioner, it is also important duty to prescribe or dispense correct spectacle lens. However, given the complex physical, physiological and psychological processes involved with the sense of sight it is not surprising that sometimes it goes wrong.(4) The differential causes can easily be classified into one of five key categories; refraction, dispensing, communication, acute ocular disease and adaptation tips to learn to adjust with new lens design.(5,6) The main objective of this study was to identify the most common reasons a patient could not be satisfied with his new spectacle. Here it can be determined reassessment rate of optical prescription in such high volume tertiary eye care practices. This data will also help to maintain standard quality protocol and audit data record.

METHODOLOGY

It was a cross-sectional review of spectacle reassessment record at the optical services department within a tertiary eye care centre in North India. The facility is a multi-specialty eye hospital that offers comprehensive eye care to patients referred from all across India. It has an attached optical services department that provides quality services as per the optical needs of the patients. The National Accreditation Board for Hospitals and Healthcare Providers regulates the quality certification process through a standardised framework. Between 1 January 2020 and 31 March 2021, data were collected from the optical services department records of the patients who returned to the department due to dissatisfaction with their new pair of spectacles. All spectacle reassessment records were reviewed and the reasons for reassessment were noted. We included those patients who came back within a month, and try them in their habitual environment, but had subsequently returned because they were either having problems with, or were unable to wear, their new spectacle. We excluded those patients who were

Developmentally disabled: These kinds of patients (e.g. Down syndrome) are mostly in hyper active mode and having less tolerance capacity to adapt or they cannot get into new thing easily.

- **Any pathological conditions:** If patient having Diabetes or hypertension than there is more chances to change in refraction due to uncontrolled systemic diseases. And met any ocular trauma or any ocular pathology leads to change in refractive media , refractive index so there is more chance of frequently change in spectacles power .

- **Self choosing**: Those who choose own pattern of glass like shifting bifocal to progressive. The reassessment record had information of power and measurements of the dispensed spectacle; final spectacle prescription along with the dispensing parameters and the reasons for the reorder was documented. The dispensing optician examined these patients first, and the spectacles were checked using the American National Standards Institute's tolerance limit standards (Z80.1–2010). If

dispensing errors were identified as the root cause; the fit of the frame, inappropriate type of lens (e.g. bifocal or progressive addition lens), and positioning of lens (e.g. bifocal at incorrect height), the spectacle reassessment record was completed and the spectacles were re-dispensed. If the non-tolerance persisted or the spectacle dispensing was failed, the patients were referred to the outpatient department of the tertiary eye care centre for further assessment by a senior optometrist and the practitioner was asked to specify the description of the problem, the old, new, and reissued prescriptions, and the optometrist's opinion of the cause of the problem. The patient's name, age, gender, unique medical record number, spectacle lens power compared to prescription, and causes for reassessment and final management were all collected from the patient's electronic medical record file. Classification of spectacle reassessment after reviewing the data, the reasons for spectacle reassessment were broadly classified under four categories: (1) wrong refractive error assessment (spherical and cylindrical errors ≥ 0.25 D, axis error ≥ 5); (2) documentation errors while typing the prescription in the electronic medical records; (3) transcription errors occurring at the optical services department; (4) dispensing errors (wrong IPD, not suitable for patient daily requirements and not ideally balanced frame for the face of patient, frame temple length not adjusted as per the patient). Forms in which the reasons for the spectacle assessment were not documented or not known were excluded from the analysis.

RESULTS

A total of 5715 Spectacles dispensed during the 15 month study period. Of these, 47 were non tolerance examinations, which accounts for 0.82% with 95% CI LL 0.59% and with 95% CI UL 1.06% of eye examinations.

AGE RANGE AND GEDER DISTRIBUTION

The age of patients attending for non-tolerance examinations ranged from 18 to 70 years of age. All patient with non-tolerance divide into 3 large age group. The highest number occurred in the more than 60 years age range (45%) (Figure 1)
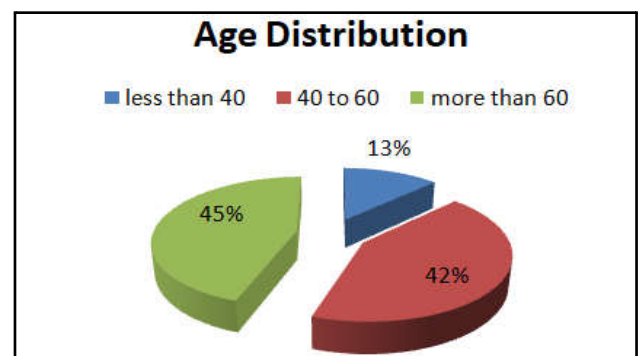

Figure 1. Presenting Age distribution

GENDER DISTRIBUTION

There was a fairly distribution between the gender for 19 females (40%) and 28 for males (60%) (Figure 2)
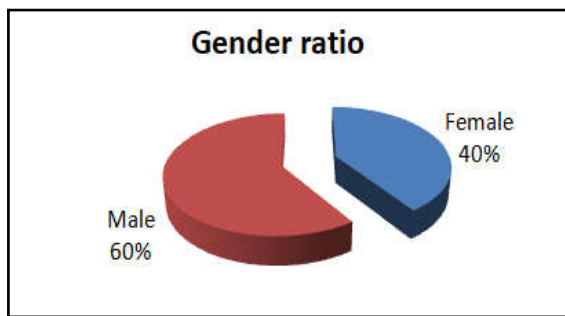
Figure 2. Presenting Gender Ratio

MAIN REASON OF NON-TOLERANCE

All the non-tolerances could be classified into four categories which were, in order of decreasing frequency: change in refraction, dispensing error, and data entry error and adaptation problem (Figure 3)
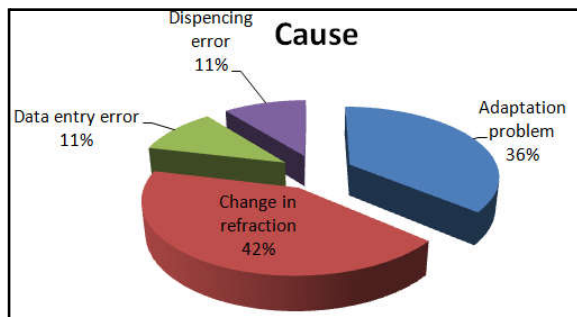

Figure 3. Presenting Reason of Non –Tolerance

ADAPTATION PROBLEM

Non-tolerances that were found to be related to adaptation problem were 36.2% of all non-tolerance examinations. In the male group found 42.86% of total adaptation problem (95% CI LL 25.00% - UL 61.80 %) and in the female group found 26.32 % of total adaptation problem (95% CI UL 5.26%-LL 48.02 %). The main reasons for these non-tolerances were, in order of decreasing frequency: PAL adaptation (45%) and bifocal lens (55%). Where male had more adaptation difficulties than female with bifocal (72.2%) and with PAL (66.6%). In other way adaptation difficulties were more frequent in above 60 years age group.

CHANGE IN REFRACTION

Non tolerance with changes in refractive correction (42.6%) was seen more than other entities. It was also seen 47.4% (95%CI LL26.3%- UL69.1%) in female group and 39.3% (95%CI LL21.4%-UL 58.2%) in male group. It was observed that refractive correction changes were frequent in less than 40 years age group that was 66.7% (95% CI LL 40%-UL 100%).

DATA ENTRY ERROR

Non-tolerance examinations 10.6 %(95% CI LL 0.00% - UL 26.9%) were attributed to data entry errors. The errors were entering an incorrect reading addition, entering an incorrect spherical prescription, using an intermediate prescription instead of a distance prescription, and making up near vision glasses instead of bifocals.

DISPENSING ERROR

Non-tolerance due to dispensing area was 10.6% (95% CI LL 0.0%-UL 26.9%). It was happened when patient's daily requirement, job profile, ocular alignment were ignored before dispensed the spectacle power.

DISCUSSION

The aim of this study was to investigate prescription non-tolerance in the tertiary eye care practice. The convention empowered the review to happen simultaneously with routine practice work. Experiencing difficulties with their new spectacles were consulted first by a dispensing optician and an appointment was only arranged with an optometrist in case the patient's concerns couldn't be tackled in the first instance by the optician. Unimportant issues (e.g. patients unhappy with their choice of frame colour or needing a simple frame adjustment) were excluded from the research. The spectacle reassessment rate revealed in various studies from the optometry, ophthalmology practice goes from 1.6% to 2.8%. (6,7,8) But the spectacle reassessment rate from a tertiary eye care centre has not been reported. In this study, we found reassessment rate is 0.82%.

MAIN FACTORS RESPONSIBLE FOR NON-TOLERANCE IS FOLLOWING: Adaptation problem involved in such kind of patients who are not able to adapt in bifocal (11 patients) or in progressive lenses (6 patients) due to their work need. In this study spectacle reassessment rate due to adaptation difficulties was more in male group than in female. Probable causes can be considered like in Indian family culture females are more adjustable, female needs a regular accompanied person to return in hospital for reassessment or they are less dependent in their daily routine.

- Change in refraction involved those patients (20 patients) due to some change in cylindrical axis, near power is missing, high addition power given and wrong fraction was done. Cylinder power mistake represented around one out of five refraction blunders and was the second most normal justification behind disappointment of acknowledgment in the refractive error estimation bunch. In this gathering the minus cylinder power was either under or over rectified. More patients returned for reassessment thus than for cylinder axis error which was extensively more uncommon.
- Data entry error, it happens sometime due to there is missing in distance power in most probably >1% of patient.
- Dispensing error involved small frame, small sag height for near and distance, shorter corridor length and prisms not induced or we can say not taken proper measurement by an optician.

According to Strang et al. the average time taken to adapt to spectacles is 1 week. (9) Forty seven of the patients in the present study returned in between one week to three weeks. Only five patients returned after 3-4 days that they could not tolerate the prescription. More presbyopes (87.2%) returned for non-tolerance examinations than pre-presbyopes. These results are comparable to the findings of Smith et al (2002)84% (10) and C E freeman 88.1%(2009) (8) of non-tolerances were for presbyopes.

Table 1. Distribution of causes of non-tolerance in gender basis

	T	%	95% CI LL	95% CI UL	M	%	95% CI LL	95% CI UL	F	%	95% CI LL	95% CI UL
Adaptation problem	17	36.2%	23.4%	52.5%	12	42.9%	25.0%	61.8%	5	26.3%	5.3%	48.0%
Change in refraction	20	42.6%	29.8%	58.8%	11	39.3%	21.4%	58.2%	9	47.4%	26.3%	69.1%
Data entry error	5	10.6%	0.0%	26.9%	3	10.7%	0.0%	29.7%	2	10.5%	0.0%	32.2%
Dispensing error	5	10.6%	0.0%	26.9%	2	7.1%	0.0%	26.1%	3	15.8%	0.0%	37.5%
Total Non Tolerance	47	100.0%			28	100.0%			19	100.0%		

Table 2. Distribution of causes of non-tolerance in Age group

	Below 40	%	95% CI LL	95% CI UL	40-60	%	95% CI LL	95% CI UL	Above 60	%	95% CI LL	95% CI UL
Adaptation problem	2	33.3%	20.0%	91.9%	7	35.0%	22.2%	81.1%	8	38.1%	13.3%	62.7%
Change in refraction	4	66.7%	40.0%	100.0%	9	45.0%	33.3%	92.2%	7	33.3%	0.0%	49.4%
Data entry error	0	0.0%	0.0%	51.9%	2	10.0%	0.0%	36.7%	3	14.3%	0.0%	49.4%
Dispensing error	0	0.0%	0.0%	51.9%	2	10.0%	0.0%	36.7%	3	14.3%	6.7%	56.1%
Total Non Tolerance	6	100.0%			20	100.0%			21	100.0%		

The highest number of non-tolerances in this study was for more than 60 year group patients. In this study there were minimum non-tolerances (13%) for patients with less than 40 year age group. The main reasons for non-tolerance examinations were, in order of decreasing frequency, those related to the changes in the refraction (42.6%) and related to adaptation time with progressive lenses (36.2%).

MANAGEMENTS

In management, (Figure 4) we counsel the patient for adaptation timing which is up to 1 month and if patient is not able to adapt or adjust in progressive, those patient shifted into bifocal and which are not able to adapt or adjust in bifocals than those were shifted in separate spectacles.

Those patients having problem in frame then we advised to changes their frame with proper measurements taken by opticians. And re-fraction was done in those patients who did not have proper refraction and if patient was having double vision without any associated ocular pathologies then prisms induced spectacles were given to them to maintain their binocularity.
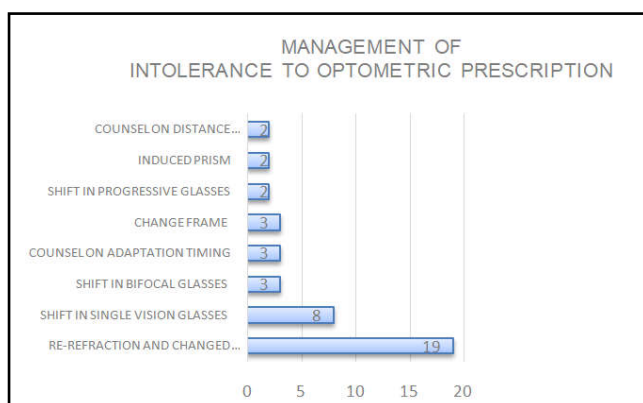

Figure 4. Management of Intolerance to optometric prescription

LIMITATION

It should be noted that this study does not capture those patients who chose second opinion outside the hospital rather than return for a re-examination. We assumed that the patients who did not return were comfortable with the prescribed spectacles.

CONCLUSION

In summary, non-tolerance examinations comprised a 0.82 % of eye examinations. In a climate where clinical governance and auditing are increasingly important, an understanding of the norms for prescription non-tolerance can help optometrist to determine best practice. The majority of patients can be helped by either a small change to their prescription or by are-assuring the adaptation tips for the new design of lens that patient has been advised or self chosen.

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