Original Article

Knowledge, Attitude and Practice of Contact Lens Users among South Indian Population

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ABSTRACT

Introduction: Despite the fact that usage of contact lens is increasing exponentially, users are unconscious about the after-exposure effects and complications arises due to unconventional usage. The main objective of the study is to evaluate the user's knowledge, attitude, practice while using the contact lens and creating an awareness about their appropriate usage and possible complications of improper usage. **Materials and Methods:** In this cross-sectional study, a validated questionnaire was sent to the participants who used contact lens at least once in their lifetime for any reason. Out of 102 respondents, 100 gave consent to participate in our study and data was recorded and analyzed. **Results:** Out of 100, 69% of participants were females and 31% were males. Majority of the subjects were in the age group of 21 – 30. Only 50% of the participants were equipped with the knowledge of reporting product quality issues and 63% of users know the complications of usage. 9% used the contact lens upon conjunctivitis. 21% used the lens solution beyond 6 months and significant number of subjects (68%) preferred spectacles over lens. Absolute recommendation of contact lens was found among 26% of users and only 29% used the lens for refractive purpose. **Conclusion:** A better knowledge was observed in majority of contact lens users about usage complications and a very few suggested contact lenses to non-users; this indicates that users are uncomfortable while using contact lens. Providing necessary training on proper usage and reporting of contact lens related adverse events to the regulatory authority shall ensure quality of the lenses marketed in India and safety of the users.

Key words: Acanthamoeba infection, Microbial Keratitis, Contact lens, Conjunctivitis, Questionnaire, Cross-sectional study.

INTRODUCTION

Significant increase in global burden of eye refractive disorders is documented.[1] Contact lens is curved and thin lens which are placed on film of tears covering the surface of eyes. As contact lenses are transparent and clear, they are difficult to handle. A slightest tinge of color is often given to make them visible and easy to handle by wearers. Prescribing Contact lens date back to more than a century for the purpose of correction of eye refractive errors, therapeutic modality for corneal pathologists and also as cosmetic purpose.[1] The continuous increase in regular improvements for contact lens materials and variants that suit different individuals has led to the overall increase in use of contact lens. Even with the availability of advanced systems, it is difficult to prove an ideal contact lens for refractive errors considering reports of complications.[2] As long as adequate lens care is ensured as directed; Contact lens are safe and effective in vision correction. However, failure to wear, hygiene, disinfection and storage of contact lens as recommended can lead increase in risk of eye infections in wearers. Different types of contact lens according to Food and Drug Administration (FDA) include, Soft contact lens which are made of soft and flexible plastic that allows oxygen to pass through the cornea are called soft contact lens which can be worn easily and comfortably. Silicon – hydro gel is the new material used for Soft Contact Lens (SCL) which offers more oxygen passage to the eye. Rigid Gas Permeable (RGP) Contact Lenses are less expensive, more durable and offer resistance to deposits. They give clear, crisper vision and easy to handle. However,

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Rigid Gas Permeable Contact Lens (RGPCL)s are less comfortable than soft contact lens which may take few weeks to get used to wearing them. A brand-new contact lens is used every day. Some Soft Contact Lens (SCL) are referred as "disposable". Various types of replacement schedules are prescribed for Soft Contact Lens wearers. After the prescribed wearing period, they are thrown away. Specialized Uses of Contact lenses are conventional contact lens and glasses work in the same way to correct the vision of eye, only which contact lens are inserted in to the eyes. Two types of lenses which serve different purpose are: Firstly, Orthokeratology or Ortho-K, is an advanced vision correction procedure. It uses Rigid Gas Permeable Contact Lens (RGPCL) which changes the curvature of cornea temporarily, to improve ability of eyes to see objects clearly. Ortho – K lenses are available for both overnight and day time use. Most commonly used are overnight lenses and prescribed to wear at least 8 hr per night. They are removed after awakening and vision correction is temporary. Cornea returns to normal original curvature after discontinuation of lenses. The second type is Decorative (Plano) Contact Lenses which are used to change appearance of eyes and do not correct the eye vision. They are also called as Halloween contact lens, fashion contact lens and colored contact lens.[3]

Possible Risks of using Contact Lenses include Giant Papillary Conjunctivitis (GPC) also called as contact lens – induced papillary conjunctivitis (CLPC). It is most common adverse effect related to contact lens and characterized by irritation, burning sensation of eyes, itching and excessive mucous production. Corneal abrasions which are mostly caused by epithelial damage or trauma due to insertion of lens. Rigid lenses are of small width which results in frequent cause of abrasions when compared to another lens. Wearing Contact Lens during abrasions is not recommended until recovery. Applying lubricating eye drops may reduce the damage. Microbial keratitis which is characterized by inflammation of cornea. It is caused by bacteria, virus or parasites that develop in the lens case or due to contamination of lens solution. Insertion of Contact Lens without proper disinfection and handling with dirty hands can promote keratitis. Acanthamoeba keratitis (AK) is a protozoan infection caused by amoeba, a free - living organism belonging to genus Acanthamoeba. Acanthamoeba keratitis is a severe vision- threatening complication of eyes. It is characterized by ring - like stromal infiltrates, epithelial damage, eyelid edema and photophobia. It is usually caused due to contamination of lens or lens solution. Improper cleaning and disinfecting of Contact Lens, use of tap water or multipurpose solutions is the major cause of Acanthamoeba keratitis.[4,5] Fungal keratitis (FK), it is mostly caused due to trauma while inserting lens, use of topical steroids and systemic diseases. Yeast - like fungi is responsible for causing Fungal keratitis and characterized by grayish- white infiltrates and feathery borders. Silicon- hydrogel lenses and Rigid Gas Permeable lenses have low risk of Fungal Keratitis and extensive wearing of Contact Lens may elevate the risk of Infection.[6]

There has been increase in recognition of extent of problems and fears on safety and quality of medical devices (MDs) in India. According to Medical Device Rule, Intraocular devices are noticed as drugs and as per risk classification it has been induced in category C i.e., moderate to high-risk medical devices. To generate database regarding adverse events (AEs) and risk-benefit ratio to public and Central Drugs Standard Control Organization, Materiovigilance Programme of India (MvPI) was launched by government of India. It is responsible for generating evidence-based information on medical devices, reporting of adverse events, assessing and data management. There has been high increase in use of intraocular devices in recent years. However AEs of Intraocular devices were less or not reported in India. Approximately 1 in every 2500 daily users of disposable contact lens and 1 in every 500 extended wear soft lenses develop microbial Keratitis every year but such information lacks in India. There exists a failure to identify potential problems regarding medical devices due to lack of reporting of adverse events and patient's exposure to unnecessary risks. Any adverse event regarding medical device needs to be reported. The most commonly used medical devices are contact lens and lens care products. MVPI established Medical Device Adverse Events Monitoring Centers i.e., hospitals/ Research institutions for reporting AEs of medical devices directly by healthcare professionals and also patients through a paper-based reporting form. Toll free number 18001803024 for seamless reporting of adverse events has also been established. Essential information such as types of adverse event, device category, identity of patient and reporter are crucial in reporting. All serious or non-serious, known or unknown, frequent or rare and all suspected adverse events are expected to be reported by health professionals. At MvPI, adverse events are screened and assessed which are received from hospitals and healthcare professionals. The results arrived after clinical assessment of the data is utilized for educational trainings to improve the safety use of medical devices. Documenting and reporting of adverse events and medical devices and their complications is need of hour. MvPI has crucial role in maintaining the safety of all healthcare products in India. Reporting suspected AEs

regarding intraocular devices is completely voluntary in nature and the identity of patient and reporter are strictly kept confidential.[7]

Although the usage of contact lens is increasing exponentially these days, wearers have poor knowledge about the possible complications of contact lens. Despite some users were good enough at the proper usage of contact lens, a greater percentage of population are not aware of importance of hand hygiene in contact lens usage. To know about the individual's perspective and knowledge about the contact lens and the practice in their daily life, Knowledge Attitude and Practice study is one of the finest approaches in recent times. The points which led us to conduct the present study are to identify the percentage of people with proper knowledge on lens usage, those who practice with utmost care, advantage of discarding lens in time, to create awareness about ocular infections and providing information about the significance of optimal usage of lens in a day. The main objective of this study is to observe the knowledge, attitude, practice of the contact lens in South Indian population with the help of a validated questionnaire.

MATERIALS AND METHODS

Study design: The current cross-sectional study was conducted in a small population of South India. The populations involved in this study were 100 in which 69% are male and 31% are female.

Inclusion criteria: The subjects involved in the study were of age group between 18 to 47 years. Subjects who had used contact lens for any period of time and for any reason in their life were included in the study.

Exclusion criteria: Subjects of age less than 18 years and greater than 47 years were excluded from the study. Subjects who did not give consent were excluded from the study.

Study procedure: Consent was taken from the study participants before participating in the study. Structured questionnaire was sent to the subjects, which consists four sections, in which the first one details about age, gender, name and the second, third, fourth sections include questions regarding knowledge, attitude and practice about contact lens respectively. The knowledge section includes questions like knowledge of reporting product quality issues, complications of lens usage, Acanthamoeba infection, microbial Keratitis. The attitude section includes questions like recommendation of lens to non-users, their preference between spectacles and contact lens, how they feel while performing daily activities. Practice section includes questions related to average duration of contact lens usage per day, hand hygiene before lens handling, usage beyond expiry date, purpose of lens usage, frequency of cleaning lens case and solution used for cleaning. Responses to all the questions from all sections like knowledge, attitude and practice were recorded and calculated for the percentages accordingly.

RESULTS

The total number of respondents in the study is 102, out of which 100 given consent to participate in our study. The subjects were assessed for Knowledge, Attitude and Practice towards contact lens wear using an 18 items questionnaire. We conducted study through a validated questionnaire made in Google forms and circulated it through emails. Respondents from South India are identified and included in the study.

Gender wise distribution

In this study, we found that 69% users were to be female while only 31% users were male. This is shown in Figure 1.

Age wise distribution

Figure 2 shows distribution of study sample according to age. Majority of the subjects were found in the 21 – 30 age group followed by 18 – 20 years. This is shown in Figure 2.

Knowledge, Attitude and Practice of contact lens wearers

It was observed that in our study 50% (n=50) of subjects have the knowledge of reporting any issues regarding quality of contact lens. Majority of subjects 63% were aware of the possible symptoms of complications where as 37% admit that they do not know any of them. 91% participants do not wear contact lens when infected with conjunctivitis and rest 9% wore. 49% knew that use of water as cleaning solution for contact lens may cause Acanthamoeba infection. 79% knew that lens solution should not be used more than 6 months. 38% of subjects had no knowledge about microbial Keratitis which can be caused by long term use of same contact lens, this is presented in Table 1.

In the study 26% admit that they would surely recommend others to use contact lens, 60% of subjects were not sure and 14% did not suggest at all. 68% of participants choose spectacles over contact lens as there is no trouble of cleaning, disinfecting and storing. Most

Table 1: Knowledge, Attitude and Practice based assessment.

S. No	Knowledge	No. of subjects saying YES (%)	No. of subjects saying NO (%)
1.	Knowledge of reporting product quality issues of contact lens.	50	50
2.	Knowledge of Symptoms of complications due to contact lens	63	37
3.	Wearing contact lens when suffering from conjunctivitis	9	91
4.	Knowledge of Acanthamoeba infection which may be caused by using water as cleaning solution.	49	51
5.	Use of lens solution beyond 6 months for cleaning lens	21	79
6.	Knowledge of long term use of same contact lens which may cause microbial keratitis	62	38
	Attitude		
1.	Felt routine care of contact lens (cleaning, carrying lens case) as troublesome	57	43
2.	Felt using of contact lens restricts from performing many daily activities (travelling, swimming)	65	35
3.	Felt the use of contact lens improved overall eye care activities	54	46
4.	Felt good and confident about the way of look after wearing contact lens	84	16
5.	Preferred spectacles over contact lens	68	32
6.	Recommend the use of contact lens to non-users	86	14
	Practice		
1.	Average duration of time using Contact lens per day (<10hrs)	23	77
2.	Washed hands before handling	91	9
3.	Used contact lens beyond expiry date	15	85
4.	Purpose of using contact lens for refractive correction	29	71
5.	Frequency of cleaning lens case daily	54	46
6.	Replaced lens solution with saline water	12	88

of the subjects 57% consider the routine care of contact lens (i.e., carrying lens case, spectacles as alternative) as troublesome. 65% of participants thought that use of contact lens restricts them from performing many daily activities (like travelling, swimming). Improvement in overall eye care activities was felt by 54% of the study subjects and 84% felt good and confident about the way they look after wearing contact lens. This is presented in Table 1.

It was observed that 77% of the participants use contact lens for a minimum of 10 hrs whereas 23% wore them greater than 10 hrs. Majority of subjects 91% washed their hands before handling contact lens and 9% did not. 85% of wearers discarded contact lens beyond the expiry date whereas 15% continued to wear contact lens beyond expiry date. Purpose of wearing contact lens for refractive use was observed in 29%, for cosmetic use in 22% of subjects and 49% of them wore contact lens for partly refractive and partly cosmetic purpose. Majority of subjects 54% used to clean their lens case daily, 25% weekly, 7% monthly and 14% rarely. 3% of study subjects replaced lens solution with saline solution for many times and 9% for some time whereas 88% had never replaced it. The Practice based assessment is stated in Table 1.

DISCUSSION

Although the use of contact lens has been increasing day by day, there exists very little literature regarding the contact lens usage, Complications of contact lens and the guidelines to be followed while using contact lens in

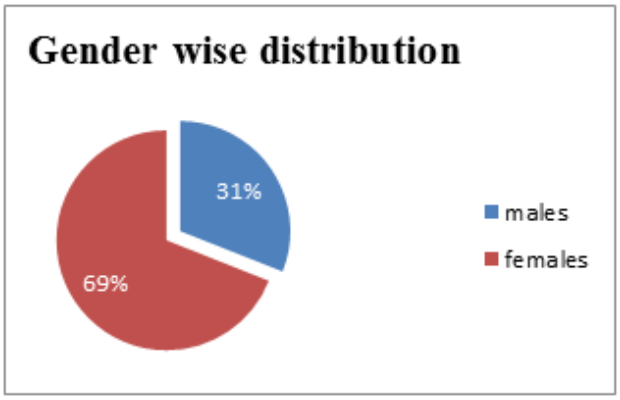

Figure 1: Gender wise distribution.

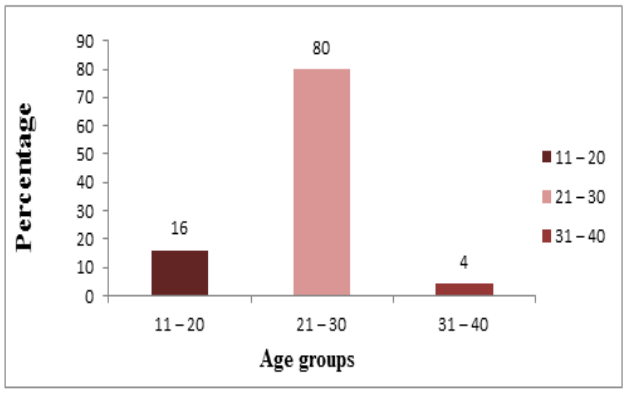

Figure 2: Age wise distribution.

south India. In the current study 29% of subjects wear contact lens for refractive purpose, 22% of them used it for cosmetic purpose and 49% of subjects used it for both the purposes. These results are in contrast with the results of T. Venkatesh Kumar *et al.* (2017) study in which only 6% of the subjects use contact lens for refractive purpose and 94% use it for cosmetic purpose.[8] In a similar study conducted by Gayatri Mahadevan *et al.* (2014) 49.2% of subjects wore contact lens for refractive purpose. 16% used for cosmetic purposes, 25% of subjects used lens for both the purposes.[9] In our study about 54% of subjects used to clean their lens case daily, 25% cleaned weekly and 7%, 14% of subjects used to clean the lens case once a month and very rare respectively. But in Curran *et al.*(2006) study very less participants (30%) used to clean their lens case daily and ophthalmologists suggests to clean the lens case daily with the contact lens cleaning solution and the cases should be replaced for every 90 days.[10] In the present study 77% of people use contact lens for less than 10 hr and 23% used them for greater than 10 hr a day and these results are consistent with the Gayatri *et al.* (2014) study where 24% used lens for greater than 10 hr.[9] But these results are in contrast with the Chavan *et al.* (2012) study where 65.5% participants used the lens for 10-12 hr/day.[11] About 85% of wearers discarded their contact lens after expiry date where as 15% of them still use the lens beyond expiry dates. But only 33% of lens users discarded the lens within expiry date in gayatri Mahadevan *et al.* (2014) study.[9] About 47% of subjects used the contact lens beyond expiry date in a Brazilian study by Vidotti *et al.* (2006).[12] A greater percentage of participants (91%) used to wash their hands before handling their lens in our study when compared to percentage of subjects washing their hands before handling the lens in Gayatri Mahadevan *et al.* (2017) (30%) and Venkatesh Kumar *et al.* (2014) (86%) studies.[8,9] Participants who preferred the spectacles over contact lens were about 68% while 32% preferred contact lens as they were cosmetically more appealing. These results are consistent with the results of Gayatri Mahadevan *et al.* (2014) study where 66.66% of subjects preferred spectacles over contact lens.[9] Usage of tap water as cleaning agent may lead to acanthamoeba infection and about 51% of participants in our study were not aware of it whereas 28% of subjects had no knowledge of acanthamoeba infection in a similar south Indian study.[9] In this current study only 9% of subjects wore contact lens while they were suffering from conjunctivitis whereas 83.33% wore contact lens even though they were suffering from conjunctivitis in Venkatesh Kumar *et al.* (2017) study.[8] A less percentage of subjects suggested the use of contact lens to the non-users (26%), and some of them denied suggesting the lens (14%) and the remaining participants were not sure about the suggestion (60%). Diversified results were obtained from a Saudi Arabian study conducted by Bashair M. Asiri *et al.* (2018) where a least population (1.5%) advised the use of contact lens to the non-users.[13]

CONCLUSION

Albeit majority of our study population has enough knowledge about reporting product quality issues, complications of contact lens usage, microbial Keratitis. They have very poor knowledge regarding Acanthamoeba infection, complications of using lens while suffering from conjunctivitis and due to usage of lens solutions beyond 6 months. Greater part of our study population preferred spectacles over lens and very few participants suggest the contact lens to non-users which defines that the users were unhappy using lens. Despite the information available digitally, providing basic knowledge regarding contact lens usage and their complications is the responsibility of every pharmacist as a part of Materiovigilance.

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CONFLICT OF INTEREST

The authors would declare that there are no conflicts of interest.

ABBREVIATIONS

FDA: Food and Drug Administration; **MvPI:** Materiovigilance Programme of India; **AE:** Adverse Event; **CLs:** Contact lens; **SCLs:** Soft contact lens; **RGPCLs:** Rigid Gas Permeable Contact Lenses; **Ortho-K:** Orthokeratology; **GPC:** Giant Papillary Conjunctivitis; **CLPC:** Contact Lens induced Papillary Conjunctivitis; **AK:** Acanthamoeba Keratitis; **FK:** Fungal keratitis.

SUMMARY

This is a Cross-Sectional study aimed to assess Knowledge, Attitude and Practice of Contact lens user. The percentage of people using contact lens are increasing like anything due to the comfort, availability, cosmetic elegance. Proper knowledge on product quality issues, complications, infections due to unhygienic use and proper practices like handling, cleaning, replacing lens solution may improve the effectiveness, safety while using contact lens. Actual reporting of adverse events of contact lens to the MVPI by health care professionals, contact lens users will increase the data regarding safety of contact lens and thereby increases the awareness among wearers regarding contact lens and usage. Proper hygiene is advised for effectiveness and safety of Contact lens.

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