INTERNATIONAL JOURNAL OF PHARMACEUTICS & DRUG ANALYSIS
VOL.4 ISSUE 3, 2016; 114 – 117 ; http://ijpda.com; ISSN: 2348-8948

RESEARCH ARTICLE

# General awareness on the care and handling of contact lens among medical, para-medical staff and students of Punjab.

**Jagmohan Sharma[1]*, Rajeev Kharb[2] , Shveta Sharma[3] , Arun Kaura[1], Sahil Durani[4]**

1. University Institute of Pharmaceutical Sciences & Research. Faridkot, Punjab.
2. CT Institute of Pharmaceutical Sciences. Shahpur, Jalandhar, Punjab.
3. Lala Lajpat Rai College of Pharmacy. Moga,Punjab.
4. Kare Partners Mother and Child Hospital. Panchkula, Haryana

*Date Received: 25th January 2016; Date Accepted: 4th February 2016 Date published: 6th February 2016*

**Email: jagmohan_dogra@yahoo.co.in**

**Abstract:** Eyes are very important for the human body and we must protect them. Eyes are the windows of soul. Without eyes, the five basic senses would not be complete. Tears are nature's lotion for the eyes. The eyes see better for being washed by them.

To maintain the proper vision sometimes we are supposed to wear lens. Wearing lenses requires proper handling and care. The study has been designed to study the general awareness on the usage of contact lens, their care and handling among medical, paramedical staff and students of Punjab. From the study it has been concluded that now a day's awareness regarding caring and handling of lens has increased as among 120 respondents 109 (90.83%) replied that prescription in necessary for wearing lens and 100 (83.33%) replied that eye examination in necessary.114 (95%) respondents replied that washing of hands is necessary for wearing lens 103 (85.83%) replied that water should not be used as storing solution. All the respondents were in favor of visual inspection of lens before wearing. These results showed that people are well aware of handling, cleaning and care taking of lens.

**Key words:** contact lens, handling, care, knowledge, medical, paramedical, Punjab.

## INTRODUCTION:

A contact lens, or simply contact, is a thin lens placed directly on the surface of the eye. Contact lenses are considered medical devices and can be worn to correct vision, or for cosmetic or therapeutic reasons.

Now a day's research is being carried out to evaluate contact lens as ocular drug delivery device. Ocular drug delivery has remained as one of the most challenging tasks for pharmaceutical scientists. The unique structure of the eye restricts the entry of drug molecules at the required site of action. Currently, most of the eye medications or ophthalmic drugs are applied directly to the eye in the form of eye drops, suspensions and ointments[1]. However, there are various limiting factors that limit permeation and incorporation of these formulations into eye. Hence, increased attention is being paid to the development of soft contact lenses with the ability to carry drugs for sustained release in the precorneal area to enhance their bioavailability, and thus, to improve the efficiency of treatments. An additional objective of such development is to simplify administration of drugs and improve compliance of therapeutic regimes[2]. Trend of using contact lens is increasing day by day for both cosmetic as well as therapeutic effect.

In 2004, it was estimated that 125 million people (2%) use contact lenses worldwide, including 28 to 38 million in the United States[3]. In 2010, worldwide contact lens market was estimated at $6.1 billion, while the U.S. soft lens market is estimated at $2.1 billion[4]. Some have estimated that the global market will reach $11.7 billion by 2015. As of 2010, the average age of contact lens wearers globally was 31 years old and two thirds of wearers were female[5].

People choose to wear contact lenses for many reasons[6]. Aesthetics and cosmetics are often motivating factors for people who would like to avoid wearing glasses or would like to change the appearance of their eyes[7]. Other people wear contacts for functional or optical reasons. When compared with spectacles, contact lenses typically provide better peripheral vision, and do not collect moisture such as rain, snow, condensation, or sweat. This makes

them ideal for sports and other outdoor activities. Contact lens wearers can also wear sunglasses, goggles, or other eyewear of their choice without having to fit them with prescription lenses or worry about compatibility with glasses. Additionally, there are conditions such as keratoconus and aniseikonia that are typically corrected better by contacts than by glasses.

The concept of altering corneal power was first envisioned by Leonardo da Vinci early in the sixteen century. In the next century, more than a hundred years later , Rene Descartes described a device , a glass- filled tube in direct contact with the cornea , capable of implementing this concept though it prohibited blinking and so was not a practical solution. In the early nineteenth century the British astronomer Sir John Herschel described the mathematics of these devices and proposed a means of treating very irregular corneas by using a glass capsule filled with a gelatin solution. In 1888 Albert Muller, the artificial eye maker, made a glass protective shell for the cornea of a lagophthalmic patient who had carcinoma of the upper lid. The patient wore device for 20 years, and corneal clarity was maintained.

**Fig.1: Contact lens**

But, perhaps the first contact lenses, scleral lenses resting on bulbar conjunctiva beyond the limbal ring, were fabricated and fit by German ophthalmologist A.E. Fick. Glass prostheses produced by Fick and others, while conceptually a step forward, suffered from reasonably rapid deterioration in the tear fluid. However they have the advantage that the glass was readily wetted by tears.

The first soft contact lenses were made of silicone, an elastomer nearly devoid of water but with good permeability to oxygen and carbon dioxide. However, the first soft contact lenses to be commercialized were hydroxyethylmethacrylate hydrogels. Developed by O. Wichterle and D. Lim in Czechoslovakia in the early ' 60 s '. Continuous improvements have progressed to the present day including milestones such as silicone-acrylate rigid gas permeable lenses in the '70 s', disposable inexpensive lenses in the 80's, daily disposable and silicone hydrogel lenses in the ' 90 s ' [8].

Soft hydrophilic lenses are fabricated from such a wide variety of materials and their blends and the FDA has grouped them according to two parameters, ionicity and water content as follow:

**Group I** includes the non- ionic polymer of low water content such as a Polymacon [a simple poly (hydroxyethylmethacrylate), HEMA.

**Group II** includes the non-ionic polymer of high water content such as Alphafilcon A ( a copolymer of five monomeric units, HEMA, vinyl pyrrolidone , ethylene dimethylacrylate, hydroxycyclohexyl methacrylate , and a substituted vinyl carbonate).

**Group III** includes ionic polymers of low water content such as Bufilcon (a terpolymer of HEMA, dimethyl oxoxbutyl acrylamide and trimethylacrylate ester of ethyl t-butane triol with some level of hydrolysis of the esters of the free acid) or Ocufilcon A (a terpo lymer with HEMA , methacrylic acid [MA] and ethylene dimethylacrylate ).

**Group IV** includes ionic polymers of high water content such as a higher water content Ocufilcon B/C or Etafilcon (a terpolymer of HEMA , the salt of MA and the trimethacrylate ester of ethyl t-butane triol) [8].

**Care of contact lenses**

It is important that contact lenses receive appropriate care to retain their shape and optical characteristics for safe use. With the exception of disposable soft contact lenses, all soft lenses require a routine care program that includes:

- Cleaning to loosen and remove lipid and protein deposits.
- Rinsing to remove the cleaning solution and material loosened by cleaning.
- Disinfection to kill microorganisms.

If the lenses are not maintained at proper intervals, they are prone to deposit buildup, discoloration, and microbial contamination. The moist, porous surface of the hydrophilic lens provides an attractive medium for the growth of bacteria, fungi and viruses. Thus, disinfection is essential to prevent infections and microbial damage to the eyes[9].

**Table 1: Contact lens classes and characteristics**

| S.No. | Lens Type | Che mical Classification | Major Characteristics |
|---|---|---|---|
| 1 | Hard , rigid, hydrophobic | PMMA ( Polymethyl methacrylate ) | Negligible gas permeability, Low water content , Medium Wettability. |
| 2 | Soft , flexible hydrophilic | HEMA ( Hydroxyethyl methylmethacrylate) | High water content, Low gas permeability, Good wettability. |
| 3 | Flexible hydrophobic | Silicone rubber | Good gas permeability , Poor wettability. |
| 4 | Rigid hydrophilic | Silicone vinylpyrollidone CAB ( Cellulose acetate butyrate ) | Good gas permeability, Good Wettability. Good gas permeability, Good wettability. |

**Table 2: General awareness regarding contact lens care and handling**

| Description | Observation; Number (%) | Observation; Number (%) | Other Details |
|---|---|---|---|
| **Gender of contact lens users** | Male; 54 (45%) | Female; 66 (55%) | Age of contact lens users is 20 – 35 years |
| **Brand of lens*** | Baush & Lomb; 52 (43.3%) | Johnson & Johnson; 46 (38.33%) | Others; 6 (13.33) |
| **Purpose of using contact lens** | Cosmetic; 55, (45.83) | Refractive error; 50 (41.66) | Both; 15 (12.5%) |
| **Type of contact lens** | Daily disposable; 25, (20.83 %) | Monthly; 90, (75 %) | Yearly; 5, (4.16 %) |
| **Prescription by cerified eye care provider** | Yes; 109 (90.83 %) | No; 6 (5%) | Don't Know; 5 (12.5%) |
| **Necessity of eye examination** | Yes; 100 (83.33 %) | No; 12 (10%) | Don't Know; 8 (6.66%) |
| **Cleaning of hands** | Yes; 114 (95 %) | No; 3 (2.5%) | Don't Know; 2 (1.66%) |
| **Using water as cleaning & storing solution** | Yes; 11 (9.16%) | No; 103 (85.83 %) | Don't Know; 6 (5%) |
| **Visual inspection of contact lens** | Yes; 120 (100%) | No; 0 | Don't Know; 0 |
| **Knowledge of shelf life of cleaning solution** | Yes; 84 (70 %) | No; 32 (26.66%) | Don't Know; 4 (3.33%) |
| **Using contact lens beyond expiry date** | Yes; 26 (21.66 %) | No; 69 (57.5%) | Don't Know; 25 (20.83%) |
| **Sleeping overnight with contact lens** | Yes; 10 (8.33 %) | No; 107 (89.16%) | Don't Know; 3 (2.5%) |
| **Complications of wearing contact lens** | Yes; 25 (20.83 %) | No; 90 (75%) | Don't Know; 5 (12.5%) |
| **Necessity of annual eye examination** | Yes; 89 (74.16 %) | No; 11 (9.16%) | Don't Know; 20 (16.66%) |

***Don't know = 16** (13.33)*

**Methodology:**

In this cross sectional descriptive study, 120 respondents including medical, paramedical staff and students of four districts of Punjab were selected. Four districts include Moga, Faridkot, Ludhiana, Jalandhar. Data was collected using questionnaire that covered all the aspects of the study objectives. Questionnaire was in English and contained questions regarding use of contact lenses, maintaining cleanness of lenses, ocular complications due to contact lenses etc. Data was collected and tabulated and percentage and proportion was calculated.

**Result and Discussion**

It has been observed from table 2 that, there were total 120 contact lens users, out of those, maximum were female 66 (55%) and 54 (45%) were male. Baush and Lomb (43.33%) is the most preferred brand of contact lens followed by Johnson and Johnson 46 (38.33%)

Most (45.83%) of the respondents used contact lens for refractive error purpose, followed by those using for cosmetic purpose (40.66%) and only (12.5%) used for both cosmetic as well as refractive purpose. The results are in accordance to that obtained from previous studies10,11. Among the contact lens user 75% respondents used lens which are to be replaced monthly 20.83 % used daily disposable and only few (4.1%) used others like yearly basis.

In this study, 109 (90.83%) among 120 respondents agreed that lenses should be used only after the prescription of certified eye care providers and 83.33%12 agreed that eye examination is necessary for the first time user. It was surprising to observe that 95% said yes that hands should be cleaned before and after contact lens insertion and removal and 85.83% said no to water as storing and cleaning solution10. Using boiled or tap water as cleaning and storage solution may cause risk of acanthamoeba infections as these organisms are commonly found in tap water 13. All the respondents agreed that lens should be visually inspected before and after use. Only 8.3% users were using contact lens overnight10which predisposes to corneal infection. Overnight wearing of lens can also lead to keratitis14. There is no problem with wearing lens replied 75% respondents but 25% replied that wearing lens either caused redness of eye of general discomfort, as observed previously also[15]

**Conclusion:**

As the trend of using lens is increasing day by day, awareness regarding caring and handling of lens is also increasing. Most of the people use contact lens only after prescription of certified eye care provider. Tendency to sleep with lens is decreasing day by day as sleeping with lens causes many ocular problems like redness of eye. Most of the respondents don not use water as storing solution and it is suggested not to use because it will cause an eye infection. Thus, we can conclude that as the trend of using lens increases awareness regarding caring and handling of lens increases.

**Acknowledge ment**: We acknowledge Dr HP Yadav, HOD department of radiation, Dr. NR Gupta, department of ophthalmology and all the teaching and nonteaching staff of department of radiation Guru Gobind Singh Medical College and Hospital, Faridkot, Punjab for their help and support.

**References:**

1. Hughes PM, MitraAK. Overview of ocular drug delivery and iatrogenic ocular cytopathologies. In: Mitra Ak, editor, 2nd ed. Opthalmic drug delivery systems. New York: M.Dekker inc; 1993. p.1-27.
2. Alvarez-LorenzoC, Concheiro-Nine A. Drug loaded soft contact lenses. Arch Soc Esp optalmol (2008) 83:73-74.
3. Barr J. 2004 Annual Report. Contact Lens Spectrum. January, 2005.
4. Nichols Jason J. et al Annual Report: Contact Lenses 2010. January 2011.
5. Morgan, Philip B., et al. International Contact Lens Prescribing in 2010. Contact Lens Spectrum.
6. Aggarwal, R. K. Contact Lens Notes, Some factors concerning patients' motivation, The Optician, (1969) 32-33 .
7. Sokol JL, Mier MG, BloomS, Asbell PA. A study of patient compliance in a contact lens-wearing population. The CLAO journal: official publication of the Contact Lens Association of Ophthalmologists, Inc (1990) 16: 209–13.
8. John C Lang, Robert E Roehrs, Rajni Jani . Ophthalmic preparations. In Remington the science and practice of pharmacy 21 st Edition Vol. 1:866-868, 2006.
9. Loyd V. Allen , Jr. , Nicholas G. Popovich, Howard C. Ansel : Ansel's pharmaceutical dosage forms and drug delivery systems, Eighth Edition:554-558, 2005.
10. Purushottam A, Waman M. Knowledge and practice of contact lens wear and care among contact lens users medical students. Int J Biol Med Res. (2012) 3 : 1385-87.
11. Aldebasi Y. Assessment of knowledge and compliance regarding contact lens wear and care among female college students. Int J Cur Res Rev. (2012):04:299-301.
12. Khan Am, Mahmood S, Mukhdoom P, Sadiq Y. Awareness of contact lens indications and care. JRMC (2013) 17: 260-261.
13. Hartstein J, Swanson Kv, Harris CR. Complications of the "Marathon" or extended-wear contact lens. In: Kist K, editor. Contemperory contact lens practice. USA: Mosby - year book (1991): 154-159.
14. Feys J. Rules and regulation concerning contact lens-related infection. J Fr Opthalmol. (2004)27: 420-423.
15. Unnikrishnan B, Hussain S. Pattern of use of contact lens among college students: A cross-sectional study in coastal Karnataka. Indian J Ophthalmol (2009)57: 467-469.