Knowledge and Practice of Contact Lens Wear and Care Among Medical Students of University of Malaya

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SUMMARY

The knowledge related to contact lens wear and practice care of contact lenses among medical students of University of Malaya was assessed through a structured questionnaire. One hundred and twenty-one contact lens wearers participated in this study. Majority of contact lens wearers were females (106, 87.6%); the duration of contact lens wear varied from less than six months to two years or more; 53 (43.8%) cited cosmetic purpose for wearing contact lens; 16 (13.2%) were not removing their contact lenses prior to sleeping at night. Despite 107 (88.4%) were aware of complications of contact lens usage, only 102 (84.3%) were adhering strictly to proper hygiene and contact lens care; and 17 (14%) continued wearing in spite of eye symptoms. Forty seven (38.8%) students sought ophthalmic consultation for eye problems. Improper practice of contact lens wear and care even in educated users such as medical students could increase the risk of complications. Therefore, a need for more education to the consumers is desired.

KEY WORDS:
Knowledge, Practice care, Contact lens wear, Medical students

INTRODUCTION

Contact lenses have become more and more important as an optical correction resource in Malaysia. Besides correcting refractive errors, they also improve the aesthetics of a person and are getting more popular among the younger population (school, college and university students, young working adults). The probable reasons for popularity of contact lens usage are the huge amounts of choices available, not only in terms of lens type and materials alone, but also the increased availability at large number of locations in the country at a much lower cost compared to the past[1].

Despite the considerable evolution of contact lens materials and designs, the fitting success has been jeopardized by the occurrence of complications, the most dreaded of which is contact lens related corneal ulcer as well as allergic reactions to either the lens or the contact lens cleaning solutions[2,3]. The corneal ulcers are mainly caused by bacterial infection *(Pseudomonas aeruginosa)* and protozoal infection *(Acanthamoeba castellani)*[4,5]. The wearer's attitude and knowledge relating to contact lens care including cleaning, disinfection, protein removal, keeping of solutions for a longer period, hygiene of hands and lens cases, a period of wear exceeding the recommended one, and the lack of regular eye assessment, have been proposed as the main causes of complications. Ky *et al* (1998) reported that 80% of contact lens complications are directly related to improper maintenance care and that the perception of the wearer's own behavior is essential to minimize or prevent complications[6].

Ocular health education especially knowledge in the correct and careful practice regarding contact lens wear can prevent complications resulting from the wearer's inappropriate behavior. One of the ways of investigating this is from the person's perception regarding his own knowledge of contact lens wear[7]. Self-evaluation regarding knowledge of contact lens wear and care can become an important indicator to how well the actual instructions of contact lens usage were given. Therefore, the study of knowledge can contribute to the planning of educational and health campaigns aiming to reduce the complications of contact lens wear in our society.

The current study was conducted among the medical students of University of Malaya. The criterion for the choice of this population was based on the assumption of better awareness of this group regarding contact lens wear and ocular health education. The objectives of this study were to determine the prevalence of contact lens wearers among medical students of University of Malaya, to determine the knowledge and perception about contact lens wear, their practice related to contact lens cleaning and maintenance, and their association with complications.

MATERIALS AND METHODS

A cross sectional study was conducted using a structured questionnaire among the contact lens wearers among the medical students during their study period in Faculty of Medicine, University of Malaya. Any medical student who has ever worn contact lens for any period of time and for whatever reason was enrolled in this study. A total of 121 contact lens wearers were interviewed by one investigator (SJP) only, from December 2006 to January 2007 using a structured questionnaire after taking their consent for participation in this study.

The questionnaire was based on the knowledge and practice of contact lens wear, care and its possible complications (Table I). All the questions were prepared in English and answers were also given in English by all the students in the interview. A pilot study (pre-test) was conducted on ten medical students one week prior to starting of the research work and modified to obtain a better understanding of some

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of the questions. The data collected were analyzed using SPSS 10.0 version program.

RESULTS

Demographic characteristics

Out of total 864 medical students of University of Malaya during the study period, only 121 of them were contact lens wearers; thus the prevalence of contact lens wearers was 14%. The majority of contact lens users were fourth year students (35, 28.9%) followed by third year and final year (25, 20.7% each), first year (19, 15.7%) and second year (17, 14%). The age of students ranged between 20 and 24 years. Majority of the contact lens users were female (106, 87.6%), with female to male ratio being 7:1. Chinese (74, 61.1%) outnumbered the Malays (44, 36.4%) and the Indians (3, 2.5%) in this study.

Regarding contact lens wear

Majority of the students came to know about contact lens through their friends and relatives (75, 62.0%); followed by mass media was next source (40, 33.1%) and optometrist recommendation in 6 (5%) students. The duration of contact lens wear varied from recent users of less than six months to more than two years (Figure 1). These students cited cosmetic or aesthetic effect as the main reason for contact lens use (53, 43.8%) (Figure 2). The majority were using monthly disposable soft contact lens (100, 82%) while the rest (21, 18%) were using conventional yearly replacement soft lenses. The main factors that influenced the students in choosing their contact lenses were feeling comfortable on wearing them (84.3%), affordable pricing of lenses (9.9%), easy maintenance (4.1%) and the cosmesis effect (1.7%). Among those who were using monthly disposable lenses, 87 (71.9%) of the students were strictly replacing their contact lens according to schedule. Nearly half of them (66, 55.5%) were wearing contact lenses between 8 to 12 hours in a day (Figure 3).

Regarding the practice of hygiene and care of contact lenses

One hundred and ten (90.9%) students washed their hands before handling contact lenses; 102 (84.3%) claimed to adhere strictly to contact lens cleaning and maintenance instructions. Regarding the practice of changing the contact lens storage solution daily at night and washing the contact lens cases daily, 96 (79.3%) students were actually doing so. An even higher number (103, 84.5%) admitted not practicing the use of enzyme tablets weekly to clean their lenses. One hundred and fifteen (95%) students were using commercially prepared contact lens cleaning solutions bought from pharmacies; 6 (5%) were using self prepared solutions i.e. boiled water/ water from the tap. Sixteen students (13.2%) also admitted to occasionally not removing their contact lenses prior to sleeping at night.

Regarding the knowledge of contact lens wear complications

Thirty seven (30.6%) students were not informed of complications due to contact lens usage by their contact lens prescribers (Figure 4). Regarding the knowledge about complications associated with contact lens wear, 107 (88.4%) students were aware about the occurrence of corneal ulcer and/or allergic reactions; 82 (67.8%) students were aware of Pseudomonas *aeruginosa* and Acanthamoeba as causative organisms for corneal ulcers. A large number of students had experienced gritty sensation (99, 81.8%) and red eye (78, 64.4%) at some point during their usage. However, only less than half of them (45, 37.2%) stated that they would definitely withhold wearing their contact lenses until their symptoms resolved; 17 (14%) students answered that they would still continue wearing their lenses despite the symptoms, and a further 59 students (48.8%) responded that they were undecided what to do. If any of these symptoms occurred, 58 (48%) students responded that they would do nothing other than stopping usage of contact lens until their symptoms cleared (Figure 5). If they ever needed medical help regarding their eye problem, one third of the students (40, 33.1%) would consult the university doctor (general practitioner) for treatment; 47(38.8%) would consult an ophthalmologist and the rest (34, 28.1%) would consult their own prescribing optometrists.

DISCUSSION

There is no data available on the prevalence and pattern of contact lens use in the published literature from our country, even though large numbers of young adults are wearing contact lenses. However, Lee *et al* (2000)[9] from Singapore has been reported that the prevalence of contact lens use was 8% in their population aged between 15 and 50 years. The prevalence of contact lens usage among medical students observed in our study (14%) is much lower than a similar study reported by Vidotti *et al* (2006) from Brazil (27.4%)[8]. More frequent use of contact lenses by females; cosmesis and convenience as main reasons for contact lens use as seen in our study, were similar to Singapore study[9].

It is very important to change contact lenses according to schedule as set by the manufacturer. Reusing the contact lens for more than scheduled time predisposes to eye complications. Seventy two percent of the students in our study were discarding their disposable lenses monthly while the same was noted in a lesser percentage of students (47%) from Brazil[8]. Twenty eight percent of students in our study were not following the time schedule of replacing the disposable lenses. A similar observation (a tendency to replace the lenses at intervals longer than prescriber's recommendations) was reported by Coopersmith et al (1997) from New Jersey, USA[10]. Most of our students were wearing contact lenses for 8-12 hours in a day. The average use of contact lenses for more than 12 hours in a day was only 4% in our study when compared to medical students in Brazil (64%)[8].

In our study 13.2% of students were sleeping with the contact lenses. People wearing contact lens while sleeping are more prone to eye complications due to longer period of contact of the lens on the cornea resulting in corneal anoxia[3]. A significantly higher incidence of severe keratitis (96.4%) has been reported by Morgan *et al* (2005) from UK[2] in people who sleep with contact lenses in the eyes when compared to those who use contact lenses during waking hours only. Another study by Feys (2004) from France[4] also noted 'overnight wear' as one of the important predisposing factors of bacterial keratitis besides poor hygiene, contaminated contact lens solution and contamination of contact lens storage case.

Eighty four percent of students in our study were following the regimen of cleaning and maintenance of their contact lenses daily, which is slightly higher than 76% reported from another study in New York, USA[6] (24% of their subjects never

Table I: List of questions asked in the questionnaire

I.	How do you know about contact lenses?
II.	Why do you use contact lenses?
III.	What kind of material is your contact lens made of (type of contact lens)?
IV.	What type of contact lenses (mode of usage) do you practice?
V.	How long have you been a contact lens wearer?
VI.	How many hours do you wear the contact lenses in a day?
VII.	How much time continuously do you wear the contact lenses?
VIII.	Do you sleep with the contact lenses on?
IX.	Do you replace with new contact lenses as per the schedule according to the manufacturer?
X.	Do you wash your hands thoroughly before wearing your contact lens?
XI.	Do you clean your contact lens adhering strictly to the instructions?
XII.	Do you use the enzyme remover tablet once a week as instructed?
XIII.	For the storage solution that you use (to store your contact lenses), do you change the solution daily?
XIV.	Which kind of saline solution do you mainly use?
XV.	Which one of the following you consider most important in choosing the type of contact lens? a.comfort (ability to wear long duration) b. pricing c. easy maintenance d. cosmesis
XVI.	Were you informed about the possible complications of contact lens usage at the time of prescription?
XVII.	Were you informed about the lifespan of your contact lenses at the time of prescription?
XVIII.	In your knowledge, what is the lifespan of contact lenses you are using?
XIX.	Which of the following, in your knowledge, are complications of contact lens use? i) Corneal ulcer ii) Allergic conjunctivitis iii) Glaucoma iv) Cataract v) Uveitis
XX.	In your knowledge, which of the following organisms commonly cause infection in contact lens related ulcers? i).Pseudomonas aeruginosa ii) Acanthamoeba castellani iii).Chlamydia trachomatis iv) Neisseria gonorrheae v).Staphylococcus aureus v) Adenoviruses
XXI.	Have you ever experienced any of the eye problems due to contact lens wear? i) Dry eye(s)/ gritty sensation in the eye(s) ii) Red eyes iii) Blurred vision
XXII.	Do you still continue wearing contact lenses if you have experienced any of the above problems?
XXIII.	When you have problems due to contact lens usage, what do you do?
XXIV.	If you seek medical help, whom will you consult?

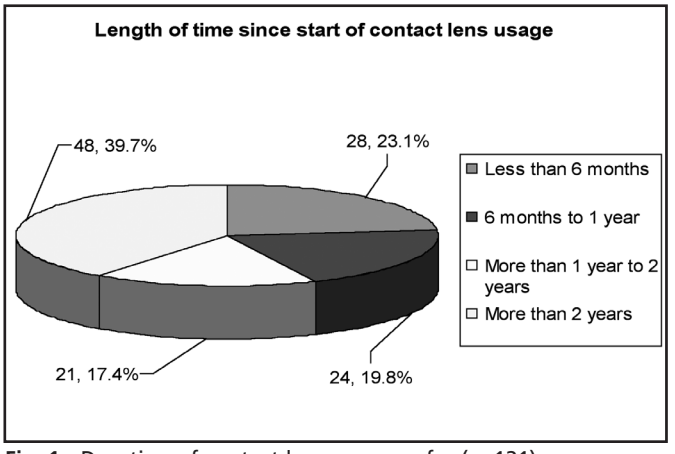

Fig. 1: Duration of contact lens usage so far (n=121).

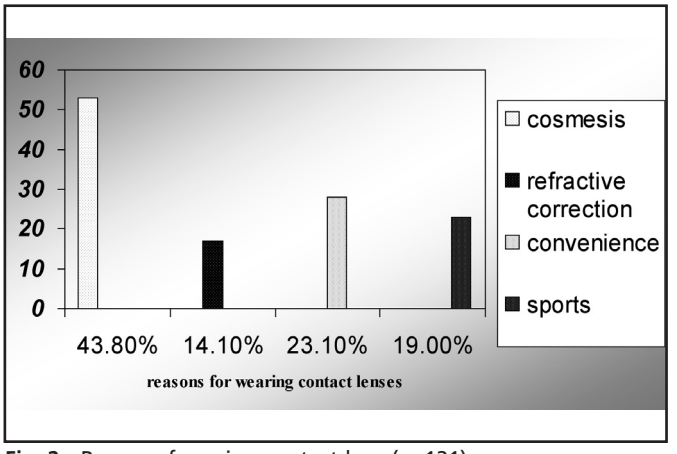

Fig. 2: Reasons for using contact lens (n=121)

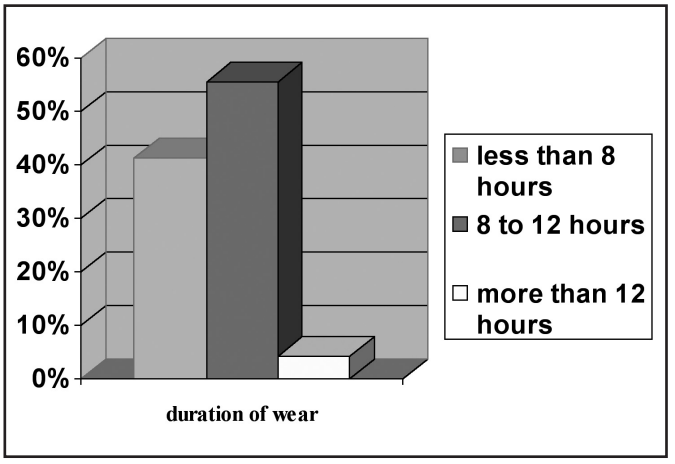

Fig. 3: Duration of contact lens wear in a day (n=121).

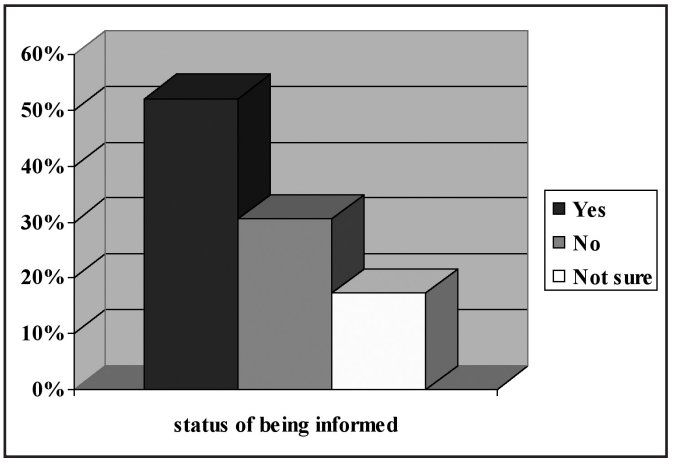

Fig. 4: Status of being informed about complications during prescription of contact lens (n=121).

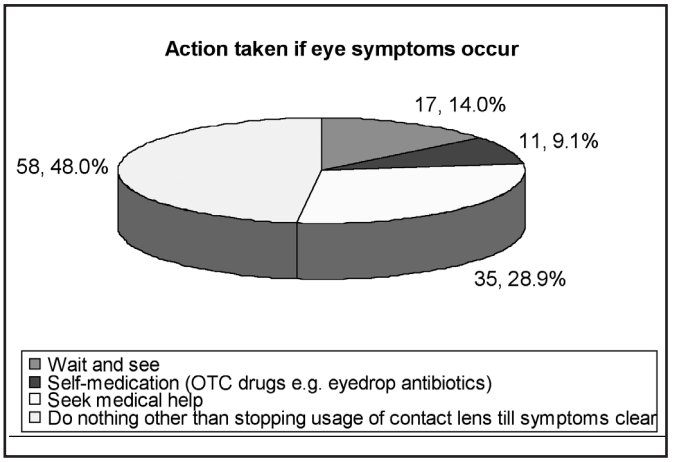

Fig. 5: Action taken if eye symptoms occur during contact lens usage (n=121).

cleaned their lenses prior to disinfection). Soft contact lenses are soaked in solution in which enzyme tablets are dissolved. This is done to remove protein deposits on the lens which can harbor pathogens within them and cause irritation and infection in the eyes[10]. This practice is an important aspect of soft contact lens wear, and 85% of our study subjects were not doing it as compared to 43% of soft lens wearers who never used enzyme cleaners or used them less than once a month, reported in the study from New York, USA[6].

It is absolutely vital to change the storage solution as there is always the possibility of contamination of pathogens[4, 5]. Moreover, when it is stored, multiplication of these pathogens and their further adherence to the contact lens makes the contact lens quite a good vector for infection to the eyes upon putting them on. It is also important that the storage solution itself is sourced from sterile solutions that are supplied by manufacturers. Self prepared mixtures are invariably contaminated. Only 80% of our students claim to change their solution daily and more worryingly, 5% were using self prepared solutions i.e. boiled water/ water from the tap. This is a dangerous practice as they could be at risk for Acanthamoeba infections as these organisms are commonly found in tap water[5].

Only 52% of students were informed by their prescribers about the complications related to contact lens wear. Informing the contact lens user about the complications related to its use is one of the many roles of a practitioner (especially an optometrist) which include assessing the need for contact lens, explanation about types and mode of usage, practices required for good contact lens care and eliciting history and examination of the eye for suitability for contact lens wear[11]. Steinmann *et al* (2005) study from Cleveland, USA[12] concerning over-the-counter decorative contact lens demonstrated that the uninformed patients who acquire lenses from unauthorized providers are significantly less likely be instructed on appropriate lens use and care, consequently have a higher incidence of acute vision-threatening infection and inflammation. In this study, even though half the number of students was informed about the complications of contact lens usage, 88% of them were knowledgeable about the complications and 68% answered the etiological agents of contact lens related ulcers correctly.

There are many eye symptoms a contact lens user can face including dry eye(s) or gritty sensation, red eye(s), excessive tearing, pain in the eyes, photosensitivity, blurring of vision and presence of haloes in the vision[13]. The students in this study mainly faced less severe eye symptoms of dry eyes or gritty sensations and red eyes. Despite experiencing eye symptoms, it is surprising that 14% of them still continued wearing contact lenses despite knowing about corneal ulcers and the risk of infection. Education must be given that removal of contact lens at the first hint of eye symptoms is absolutely vital for early recovery from the complications.

CONCLUSION

We conclude that knowledge of contact lens usage alone may not ensure correct practice care in contact lens wear and care as evidenced in this study. The lack of proper practice even in educated and knowledgeable users such as medical students may increase the risk of complications associated with contact lens wear. There is a need for more education to the consumers about the contact lens care and complications related to contact lenses, which should be provided by all contact lens providers so that the prevalence of eye complications will be lessened among the contact lens wearers.

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