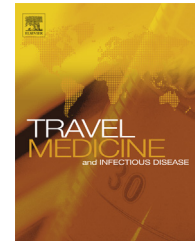




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Contact lens wearers' experiences while trekking in the Khumbu region/Nepal: A cross-sectional survey

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Summary *Background:* Safe contact lens wear depends on a hygiene regime and lens-appropriate wear patterns which may be compromised during travel in remote and wilderness areas. The purpose of this study was to describe the experience of contact lens wearers while trekking at high-altitude in Nepal.

Methods: For this descriptive study, trekkers with contact lenses were recruited in Lukla and invited to complete an online-questionnaire on trip preparation, contact lens use, care and experiences, and possible changes for future travel. Quantitative data were analysed using SurveyMonkey; content analysis applied to qualitative responses.

Results: The majority of the 158 participants (124; 78.48%) reported no problems with their lenses (daily disposables, soft lenses, extended-wear lenses, hard/rigid lenses) during their stay although dry air, dust, wind, cold temperatures, and difficult hygiene maintenance were challenging. Freezing lenses and freezing solutions were additional challenges. Thirty-four (21.52%) experienced a variety of problems. Improvements were requested from manufacturers. Lodges should provide better access to clean water, mirrors and lighting. Almost 60% of participants had not sought any pre-travel health advice.

Conclusions: Remote and wilderness areas provide a challenge for appropriate contact lens wear and care. The decision between the potential risk of infection due to touching lenses (daily disposables, soft/hard lenses) and the potential risk of corneal erosion (extended-wear lenses) needs to be made in pre-travel consultations. Travel health professionals and travel agencies should remind CL-wearing trekkers to carefully assess their wear and care routine to accommodate potentially challenging conditions.

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1. Background

In the mid-2000s, an estimated 140 million people worldwide wore contact lenses (CLs) [1], a figure that will have increased during the last 10 years. A wide range of CLs is now available from hard/rigid to soft lenses with varying wear patterns [2]. Newer materials are designed for overnight and extended-wear, while other lenses are worn for a day only and discarded. In most cases, the purpose of CLs is to replace glasses. Due to the possibility of corneal erosions [3], wearing CLs carries an increased risk of bacterial, viral, fungal, and amoebic infections, mainly microbial keratitis with potentially severe complications, including loss of vision. A major contributor to such complications is the breakdown in hygiene when handling and storing lenses. While clean hands are imperative [4], the contamination of lens cases [4–7] and solutions [7] has been reported [1,8,9], as additional sources of infection. Corneal erosions can also be caused by the ‘binding’ (= strong adhesion to the cornea) of CLs [3], especially if the lens is worn contrary to the manufacturers’ specifications, e.g., sleeping with the lenses. ‘Stretching’ (= wearing CLs longer than designed for) also increases the risk of complications [7].

In a recent article on 100 innovations not specifically invented for tourism but impacting it favourably, from passports (1414), to elevators (1854), Gore-Tex (1976), Viagra (1998) or avatar-embodied agents (2012) [10], the CL is missing. Many millions of CL-wearers travel, and many tourist experiences are enhanced by choosing CLs over glasses. However, particularly in remote and wilderness areas, changed and extended sleep-wake patterns, and a lack of basic infrastructure to maintain acceptable standards of lens hygiene, can pose serious health challenges for those who cannot or do not want to wear spectacles for a variety of reasons. The extent of such practical challenges due to travel, transport, accommodation, environment and activities is surprisingly large [11]. Until recently, literature on CL-wear during travel has been limited [12] and information may have to be related to travel: for example, the relationship between tropical climates and microbial keratitis [9] or factors that influence the comfort of soft CL-wear [13]. There are few data on CL-wear in challenging environments. A study in 1988 on CL-wear at altitude simulated atmospheric pressure in aircraft environments [14]. Later, Butler [15] discussed briefly the use of CLs during mountaineering. Later, recommendations for prevention and onsite treatment of eye problems were made [16]. Practice guidelines for treatment of eye injuries and illness [17] and a consensus statement on eye problems on expeditions [18] reflect the increase in adventure tourism and with it the increased need for the consideration of ocular health. The literature offers important professional information and recommendations. However, little is known about the practical experiences of those who travel with CLs.

Travel to and in resource-poor, rural, remote or wilderness areas can suddenly pose unexpected challenges. With rapidly increasing tourism to developing countries, including adventure tourism, CL-wearers’ experiences in the field are important as a basis for the design of travel health strategies in terms of lens type, wear patterns and

care regimes. Nepal is popular for its wide range of natural attractions and opportunities for adventure sport. One magnet for adventurers is the Khumbu region in the Sagarmatha (Mt Everest) National Park with a number of high-altitude treks and climbs, the most popular leading to Everest Base Camp. October/November is the peak season for trekking in the Khumbu; 8282 foreign tourists visited the park from mid-October to mid-November 2013 [19]. This location was chosen for a survey on trekkers’ field experience with CLs.

The aim of this study was to describe high-altitude trekkers’ experiences with their CLs. In particular, the project aimed to ascertain their a) pre-travel preparations, b) experience during the trip in terms of wear pattern, comfort, care regime, practical challenges with hygiene maintenance, and any ophthalmological problems, and c) wish list for the ideal travel CL, so that recommendations may be made for contemporary travel health advice on CL-wear during travel to remote and wilderness areas.

2. Methods

2.1. Design

This descriptive study employed online data collection using the web-based questionnaire (SurveyMonkey® SELECT) with seven sections: A – Demographics and contact lens history, B – Preparation for this trip, C – At the destination, D – Your contact lens use on this trip, E – Contact lens care, F – Your experiences, G – Future outlook. The final questionnaire was reviewed by CL-wearing university colleagues. Minimal adjustments were made. Two months before leaving for Nepal, the form was tested in Peru. Ten trekkers returning to Cusco completed and commented on the questions. Completion of the form took about 10–15 min. The survey closed on 9 December 2013.

2.2. Participant recruitment

Lacking figures about trekkers during that time, or population-based figures of CL-wearers, convenience and snowball sampling captured as many English-speaking international tourists as possible who were over 18 years of age, and who had been wearing CLs on their trek in the Khumbu region. The participants were recruited in the village and at the airport of Lukla from 5 October to 4 November 2013. Lukla is the entry to the Khumbu region and the starting point for a number of popular high-altitude treks.

James Cook University’s ethics committee approved the study (H4995) after establishing local requirements. The local airport authority gave permission to approach trekkers as they entered the departure lounge for their return flight to Kathmandu.

2.3. Data analysis

Quantitative data were analysed using the analysis capabilities of SurveyMonkey® SELECT to conduct descriptive analysis on frequencies, percentages, and cross-

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