HIGH ALTITUDE MEDICINE & BIOLOGY
Volume 15, Number 1, 2014
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DOI: 10.1089/ham.2013.1108

Dental Problems and Emergencies of Trekkers—Epidemiology and Prevention. Results of the ADEMED Expedition 2008

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Abstract

Küpper, Thomas, Malaika Hettlich, Johannes-Peter Horz, Kerstin Lechner, Christine Scharfenberg, Georg Conrads, Said S. Yekta, Friedrich Lampert, and Claudia Gore. Dental problems and emergencies of trekkers. Epidemiology and prevention. Results of the ADEMED-Expedition 2008. *High Alt Med Biol.* 15:39–45, 2014.—***Objective:*** Dental problems are rarely mentioned in the training of medical students or physicians in travel medicine, and there are little data on dental problems of travellers in the literature. We studied the epidemiology of dental problems amongst trekkers in Nepal to develop strategies for preventive care during/before travelling and propose a curriculum for dental First Aid training.

Material and Methods: We undertook a prospective, cross-sectional questionnaire and clinical dental survey of Trekkers at Manang (3550 m, Annapurna Circuit, Nepal). The questionnaire was developed based on published literature and clinical experience (exploring: availability of dental kits, dental history, current dental problems, and nutritional behavior). Dental examination included: dental status, papillary bleeding index (PBI), and plaque index (Quigley and Hein; QH). Questionnaire and clinical findings were compared to data of the Annapurna Conservancy Authority about the number of days of trekkers in the region to estimate the incidence of dental problems of trekkers.

Results: None of the 309 participants carried a dental first aid kit. Dental problems, potentially treatable with a dental first aid kit, were reported by 50/309 (16.5%). Oral hygiene en route was significantly worse than home hygiene practice; overall increased plaque indices were found (Median QH: 2.25 in women; 2.36 in men). Participants who visited a dentist ≤ 6 months before departure had significantly fewer problems, and had lower PBI [males 0.07 (IQR 0.0 to 0.29), females 0.0 (IQR 0.0 to 0.11)]. Combining our findings with data of the park authorities on person days in the region (2007), we found a risk of dental problems as follows: any dental problem 1:23.7 trekking days; gingival bleeding 1:37.7 trekking days; dental pain 1:145.2 trekking days; lost fillings 1:339 trekking days; fractured teeth 1:509 trekking days.

Conclusions: Dental problems can pose significant discomfort for anybody travelling in regions with low/missing infrastructure. Improved awareness regarding dental first aid is essential and physicians counseling travellers in preventive strategies should advise a dental checkup pre-departure. Dental first aid and emergency treatment in the field should be included in the training curricula in travel medicine for both undergraduate and postgraduate students.

Introduction

The number of trekking tourists to popular destinations continues to increase. For example, since the 1980s the number of visitors to Nepal has risen over 1000% (Fig. 1) (Ministry of Culture, 2012). In parallel, the number of medical emergencies has increased. The spectrum of trekking emergencies differs from those of mountaineering due to the different risk profile of such tours, but also because travellers are significantly older and thus statistically more likely to be

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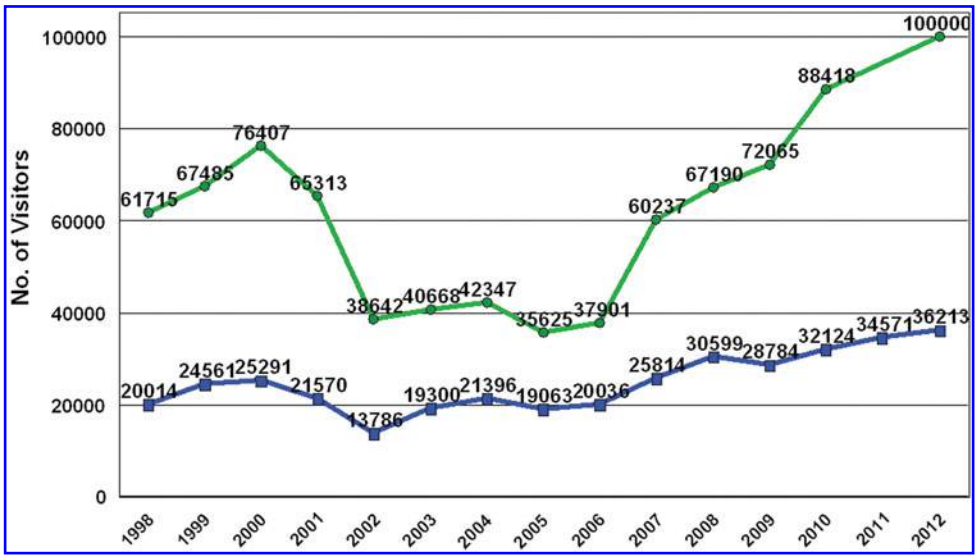

FIG. 1. Tourists in the Annapurna Conservation Area (*upper curve*) and the Sagarmatha National Park (Solo Khumbu/Mount Everest region, *lower curve*), Nepal. Data from the local authorities of the parks (2012 of Annapurna region estimated).

affected by chronic medical conditions (Kupper et al., 2003, Lechner, 2013, Muller-Ost (in preparation), Schmitz (in preparation).

Planning for potential medical problems should be an integral part of trip preparation of trekkers and especially for physicians going on such trails, as they are likely to be called upon for assistance. However, detailed data on the probability of specific diagnoses and first aid and further treatment are still limited (Lechner 2013, Muller-Ost (in preparation), Schmitz (in preparation). This is surprising since the total number of people visiting high altitude and remote regions (not only for trekking) has been estimated at about 40 million (Mees and Olzowy, 2008).

There appears to be a difference in the personal risk management of participants of commercial tours compared to individual trekkers: Shlim and Gallie (1992) showed that the risk of dying from any type of high altitude disease, such as high altitude pulmonary edema (HAPE) or high altitude cerebral edema (HACE), increases 5-fold at the moment of booking (Shlim and Gallie, 1992). Obviously the participants do an outsourcing of risk management when they trust the organization to do a proper job—but obviously this is not reality. Although the companies claim to plan their trips according to international recommendations concerning acclimatization and altitude profile (Eggert, 1998), this is not true. During ADEMED Expedition 2011 (www.ademed.de), we observed several life-threatening and unfortunately some fatal cases (Kupper et al., 2012; Kupper and Hillebrandt, 2012). An actual analysis of altitude profiles of commercial treks is given in Figure 2. The profiles of some regions are even worse (e.g., Kilimanjaro, Everest Basecamp Trek). All these data and facts indicate the importance of qualified advice in travel and altitude medicine and an analysis of the tour before booking. Recently, Lechner et al., (2013) and Gschwandtl et al. (in preparation) indirectly confirmed this when they found significantly less knowledge in First Aid concerning trekking incidences in trekkers who had joined a commercial tour.

Data on dental problems and emergencies of trekkers and general travellers are scarce. Herrmann and Laskin (2007) describe the management of dental injuries in the wilderness, but they do so in a purely descriptive manner and give no data on the probability of such incidences. From other collectives some data have been published, for example, from Voluntary Service Overseas, a British non-governmental organization where 22.8% of all volunteers suffered from any kind of dental problems during their stay abroad (Bhatta et al., 2009). In contrast, the rate of dental problems in crew members and passengers of cruise ships seems to be relatively low at 4.3% (Sobotta et al., 2007, 2008). Shaw et al. (2009) reported that dental problems of members of a palaeological expedition to the Gobi Desert were quite rare, but this was a well prepared and medically surveyed group.

If dental problems should occur during trekking, it will take several days until patients may be able to see a dentist—who may have less training than colleagues from high-resource countries. A careful evaluation prior to our study showed that training in dental medicine for medical students or physicians/

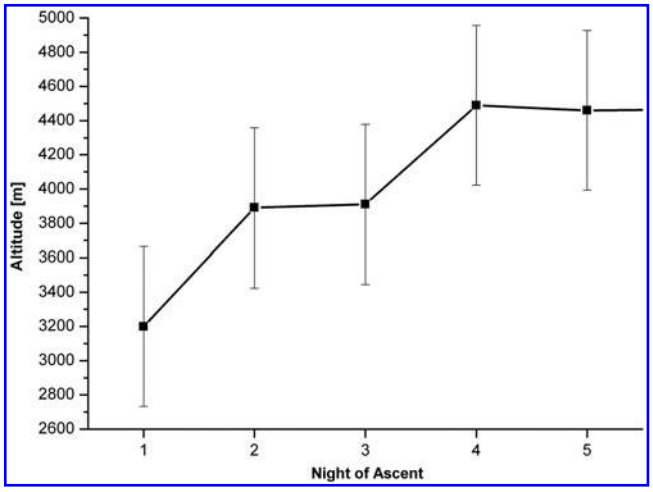

FIG. 2. Altitude profiles of commercial treks ($N = 20$, randomly chosen from leading European companies). The graph is nearly identical to a similar one which was created in the 1990s by one of the authors for lectures (T.K., unpublished).

surgeons is extraordinarily rare. To our knowledge, the only institutions providing such training are the Wilderness Medical Society, the British curriculum ''Wilderness Medicine,'' and the University of Aachen, Germany.

We undertook a prospective cross-sectional questionnaire and clinical dental survey of trekking individuals at altitude in Nepal. We aimed to establish the epidemiology of dental problems in this group, with particular focus on the incidence and clinical findings.

Material and Methods

The study was performed at Manang, a village on the Annapurna Circuit, Nepal, at 3500 m. Trekkers arrive here at Day 5 or 6 of their trek and stay for an acclimatization day before they continue to Thorong La (5416 m). Inclusion criteria were trekkers of at least 18 years of age, who were nonsmokers with no antibiotic therapy for 3 months prior to the actual trekking. The study design was a cross-sectional prospective questionnaire and clinical dental study (study period February and March, 2008).

A questionnaire was developed for this study, based on available literature and clinical experience/practice (MH). The questionnaire was available in three languages (German, English, and French; developed and sense-checked by native speakers of each language). The following information was collected:

- personal demographics (age, country of origin, gender)
- trip details (duration of travel prior to arrival at Manang)
- dental history (known pre-existing problems, treatments, frequency of dental visits, most recent dental visit, dental issues during previous travels)
- dental/oral hygiene habits prior and during the trek; oral hygiene was classified according to Holtfreter et al. (2010)
- self-reported dental problems during the present trek, such as gum bleeding, tooth pain, loss of fillings. Participants were encouraged to describe the events in as much detail as possible
- diet questionnaire

All participants were invited to undergo a dental examination in addition to the questionnaire. Here the following examination findings were recorded:

- visual inspection for fillings or crowns
- manual check for loosening of teeth
- cold sensibility of Ramfjord teeth (Ramfjord, 1959), (Fleiss et al., 1987)
- measurement of the depth of gum sulci parodontometer (Henry Schein Dental Depot)
- papillary bleeding index (Saxer and Muhlemann, 1975)
- plaque status according to Quigley and Hein with methylene blue (Quigley and Hein, 1962).

The following clinical classifications were applied:

- Loosening of teeth: Grade 1 (barely palpable horizontal mobility up to 1 mm), Grade 2 (distinct visible and palpable horizontal mobility of more than 1 mm), and Grade 3 (distinct horizontal and vertical, which may be identified also without palpation, because movements also occur by buccal pressure by the tongue).
- Papillary bleeding index: Grade 0 (no bleeding), Grade 1 (bleeding spot), Grade 2 (several bleeding spots or slim bleeding line), Grade 3 (interdental space filled with blood), and Grade 4 (significant bleeding with dropping and blood flowing over the neighboring teeth).
- Plaque status: Grade 0 (no plaque), Grade 1 (occasional small plaques near the gingiva), Grade 2 (distinct plaque line up to 1 mm along the gingiva), Grade 3 (plaque covering the cervical third of teeth), Grade 4 (plaque covering up to the mean third of teeth), and Grade 5 (plaque reaching into the coronal third of teeth).
- The prevalence of increased depth of sulci were defined according to Holtfreter et al. (2010) as ''mild periodontitis (2 teeth with more than 3 mm), ''moderate periodontitis'' (2 teeth with at least 4 mm), ''moderate to severe periodontitis'' (1–2 teeth with at least 5 mm), and ''severe periodontitis'' (2 teeth with more than 6 mm) (Holtfreter et al., 2010)

All information was anonymized. Statistical evaluation was performed with Student's *t*-test for data with normal distribution. Data not following normal distribution were evaluated with nonparametric tests (Mann-Withney-U-test), and findings are presented as median with interquartile range (IQR) unless otherwise indicated. Cross tables were calculated by Chi-square-test. Significance was defined as $p < 0.05$. Written consent was obtained from all participants. The study was approved by the ethical committee of the University of Salzburg/Austria.

Visitor statistics regarding the number of visitors and duration of their stay were obtained from the authorities of the Annapurna Conservation area to extrapolate/estimate the overall incidence of dental cases in the region. These data are considered reliable because visitors are required to check-in when they arrive and check out when they leave the region, in addition to signing in during the trip at several police posts en-route.

Results

Participants, demographics, clinical history, and trip preparation

A total of 318 volunteers joined the study. 309/318 questionnaires were complete and could be evaluated (97.2%). 59.4% were males, 40.6% females. 301/309 also agreed to get the dental check (97.4%; 59.1% males, 40.9% females). Mean age was 35.7 years (± 12.9; range 18–69). Countries of origin were from Europe (238/309; 75.4%), North/Central America (34/309; 10.7%), Israel (31/309; 9.7%), Australia/New Zealand (10/300; 3.1%), and others 5/309; 1.1%). Any personal experience in altitude trekking was reported by 135/309 (42.5%), none by 183/309 (57.5%). Regular travel at moderate/high altitude [i.e., ≥ one stay per year above 3000 m] was reported by 120/309 (21.9%). Less than half the participants had undergone first aid training of any kind (146/309; 45.9%); physicians or medical students were common among participants (64/309; 20.2%) as were paramedics (23/309; 7.3%).

Dental history

The majority of participants reported regular dental check-up visits (258/309; 83.5%) Intervals between dentists' visits varied among 3 months (4.9%), 6 months (32.5%), 9 months (9.4%), 1 year (43.4%), and 2 years (9.4%). Most visits to the dentists were for general (not trip-related) prevention (78%), 11.3% had conservative therapy (e.g., filling), 6.1% prosthetic therapy, and 9.1% were treated because of acute pain. Findings

from participants who had received invasive treatment during the 6 months prior to their current trip did not differ significantly from those who had dental prevention visits.

The last contact to a dentist was up to 6 years previous to the actual trekking. The majority of participants who reported their most recent dental visits (218/268; 70.6%) visited a dentist less than 1 year before departure and many (172/268; 64.2%) had seen their dentist 1–6 months prior to the current trip. Of those, 139/172 (80.8%) cited that a regular check-up visit was the reason. The longest interval between visits was 3–6 years (11/268; 4.1%). No differences in visit frequency were observed between males and females.

A minority of participants reported dental problems during previous trips (21/309; 6.8%): 2/21 had gingivitis, 4/21 lost fillings, 3/21 lost crowns, 1/21 suffered a dental fracture, 2/21 reported significant heat and cold intolerance, 2/21 observed acute root inflammation, and one person reported barodontalgia under a filling; 6/21 reported problems not otherwise specified.

Oral hygiene, dental problems and dental status

Participants, who had been checked by a dentist <6 months before departure, tended to have fewer dental problems overall during the current trip (27/172 [15.2%] versus 24/96 [25%]; $p=0.063$) and significantly less bleeding problems (6/172 [3.5%] versus 10/96 [10.4%]; $p=0.022$). No significant differences between these groups were observed for the frequency of lost fillings or pain, plaque index, or bleeding index.

Dental hygiene practices varied significantly between home and trip: 182/309 (73.2%) reported twice daily teeth-cleaning, 15.6% once/day, and 11.2% 3x/day versus trip-hygiene frequency of 69.1%, 27.0%, and 3.9%, respectively; $p<0.001$. While 74/309 participants used electric brushing systems at home, this portion decreased to only 4/309 during travel. Cleaning duration was reported as 1 minute (17.8%), 2 minutes (55.7%), and 3 minutes (26.5%) at home versus 26.2%, 53.7%, and 19.7%, respectively on the trek; $p<0.001$. Dental floss was used by 142/309 (46%) of the participants at home and only 56/309 (18.1%) on tour ($p<0.001$). The use of interdental brushes or dental sticks (85/309, 27.5%) was reduced by half on the trek to 37/309 (12%), $p<0.001$.

Clinical findings. Neither the plaque index nor the bleeding index showed normal distribution. The median plaque index for all participants ($n=301$) was 2.32 (range 0.26–3.75) and 0.02 (0.0–2.36), respectively.

There was no significant difference in bleeding index between good versus decreased oral hygiene ($p=0.14$) but good dental hygiene during the trip was associated with a significantly lower plaque index ($p=0.003$):

- <2 min tooth-cleaning/brushing: median plaque index 2.41 (IQR 2.17 to 2.76)
- $>=2$ min tooth-cleaning/brushing: median plaque index 2.28 (IQR 2.11 to 2.54)

Significant differences were observed between men and women for both the plaque index and the bleeding index:

Males: Median plaque index 2.36 (IQR 2.19 to 2.64)
Median bleeding index 0.07 (0.0 to 0.29)
Females: Median plaque index 2.25 (IQR 2.11 to 2.50); $p=0.005$
Median bleeding index 0.0 (IQR 0.0 to 0.11); $p=0.004$

Dental clinical examination at the study site at Manang revealed that 229/302 (75.8%) showed no or minor problems with deep gingival pockets, while 64/302 (21.2%) had mild and another 2.9% (9/302) had moderate or severe problems. Oral hygiene during the travel was not correlated with the number or depth of the gingival pockets. Women had significant less problems with gingival pockets than men ($p=0.012$). There was no correlation between the depth of gingival pockets and plaque or bleeding index. The difference between smokers and nonsmokers with respect to depth of gingival pockets was not significant.

Sensibility, loosening or non-vital teeth were found at 13% of the participants. Only 1.7% (5/309) showed loosening of singular teeth (Grade I–III). All of these teeth were 41 and 44 and had gingival pockets of 3–5 mm, which suggests a periodontal problem as causing mechanism. All loose teeth were vital.

When dental problems and oral hygiene was compared between age groups which were classified as ''young'' (18 to 30 years), ''middle-aged'' (30.1 to 50 years), and ''old'' (>50 years), there was no significant difference concerning dental problems, cleaning, and plaque index. The ''old'' group showed a tendency to more frequent dental check-ups before departure ($p=0.089$). Trekkers of the ''middle-aged'' group showed more often gum bleeding than the younger ($p=0.05$) and the older group ($p=0.043$). The older the participants, the more frequent were gingival pockets of 3 mm or more in depth ($p<0.001$, Table 1).

Estimation of the overall frequency of dental problems amongst trekkers

Dental problems of any kind were reported by 23.2% of participants. The most frequent problem was gum bleeding (7.0% spontaneous bleeding, 7.6% bleeding when brushing). Acute pain was reported by 3.8% during the 5–6 days to reach the study site at Manang (i.e., not the complete trip duration). 1.1% reported dental fractures and 1.6% had lost a filling. With the general travel itineraries of our participants, the frequency of such problems may be calculated at 1 problem per 23.7 trekking days (for details, see Table 2).

With these data and a general trip duration of 11 to 13 days (Bhulbule to Jomsom), and 18 to 23 days for the complete Annapurna Circuit the probability is high that at least one group member will suffer from dental problems amongst groups of travellers. The total number of dental problems in the tourist population in this remote region may be estimated with the data from the Annapurna Conservation Area government: The total days of tourists in the region in 2007 was 903,550. Extrapolating from the findings of our study, one would expect to see an estimated 30,000 cases of dental problems—with 24,000 cases of bleeding gums, 6200 cases of dental pain, more than 2600 lost fillings, and 1700 tooth fractures.

Table 1. Gingival Pockets of 3 mm or More in Depth in Different Age Groups

Problem with gingival pockets	*18–30 years (N=157; 49.4%)*	*30.1–50 years (N=104; 32.7%)*	*>50 years (N=57; 17.9%)*
No	88.0%	71.2%	50.0%
Mild	11.3%	24.7%	42.6%
Moderate/severe	0.7%	4.1%	7.4%

Table 2. Frequency of Dental Problems of Trekkers

Dental problem	*Frequency per X trekking days*
Any kind of problem	1 : 23.7
Gum bleeding, total	1 : 37.7
Induced by brushing	1 : 72.2
Spontaneously	1 : 78.3
Tooth pain	1 : 145.2
Lost filling	1 : 339
Tooth fracture	1 : 509

Although 200/309 (64.7%) carried along any kind of emergency kit or drugs, the other 35.3% did not carry anything to treat medical problems en-route. The majority of drugs were analgesics (171/200; 85.5%), antibiotics (145/200; 72.5%), and anti-inflammatory drugs (142/200; 71.0%). Only 10/200 (5%) or 3.2% of the total number of participants, had a specific dental first aid kit available. None of the participants who reported dental problems had a dental first aid kit. The dentist of our team treated 6 of the 23 patients with acute problems at Manang (provisional fillings, cleaning in cases of severe gingivitis/periodontitis, and specific antibiotic therapy).

Discussion

Our study shows that dental problems are common in trekking tourists, can be potentially troublesome, and would often be treatable with a dental first aid kit. To our knowledge, we are the first to specifically investigate this issue and provide detailed epidemiological as well as clinical data.

Limitations

The questionnaire developed for this study was not validated prior to use. We consider the questionnaire a standardized medical/dental history tool, which was designed to collect relevant data reliably without the variation in individual history taking that might have occurred otherwise.

A relatively large number of participants had a background in healthcare. We cannot say if the overall demographics of travellers in the Annapurna Region always has high healthcare professional numbers. However, generally lower numbers of healthcare professionals amongst travellers would make our findings stronger, as even fewer dental kits would potentially be carried.

The risk estimates based on the 2007 Annapurna travel data may be incorrect. The majority of trekkers, who passed Manang during the study month consented to participation in the study. This represents circa one third of the season for trekking in that area. As all travellers have to (mandatory) check in and out at various points for safety reasons, we consider the overall regional numbers reliable. Although there may be variation in risk estimation, this would not change the overall message, that it is very likely for dental problems of some sort to occur during a trekking trip of this nature.

Only a few studies have reported on dental problems during travel and none have addressed longer journeys in high altitude regions.

Bhatta et al. (2009) reported on VSO-participants, who were abroad for weeks to 12 months and whose age was comparable to that in our group. They found that 22.8% experienced dental problems whilst abroad. However, they do not present any associated clinical findings or risk-estimates. Sobotta et al. (2007) studied cruise passengers, who were older (67 ± 11.5 years; patients 71 ± 9.8 years) and experienced fewer problems overall (Sobotta et al., 2007). They did not present risk-estimates and we do not consider their cohort to be comparable to ours. Shaw et al. (2009) studied participants in a palaeontological expedition and found no problems for the highly selected group of scientists (all dental problems experienced by local population and treated by the group).

Other factors may affect the prevalence and type of dental problems during travel. Significant differences in dental health have been found in different nationalities (e.g., between Australians, British, German, or U.S.-Americans) (Crocombe et al., 2009). Other studies found that the Dutch (Kalsbeek et al., 1998) and the Swiss population (Menghini et al., 2003) enjoy the best oral health. We were unable to draw conclusions, due to the large number of nationalities represented, leaving us with very small subgroups. However, the prevalence of periodontitis in our collective is significant higher than those of the German population. Micheelis and Reich report a prevalence of about 14% for their age group from 35 to 44 years, which fits best to our collective (Micheelis and Reich, 1999). Factors like education and social status influence the prevalence (Table 3), but all subcollectives of their study show significant lower prevalences than trekkers. In our collective, the middle age group shows a higher prevalence than youngsters, which is in accordance with Micheelis and Reich, but in contrast to their results in our collective the prevalence decreases in old trekkers again. This does not prove a minor risk for older trekkers but should be an effect of the age distribution of the group investigated.

Smoking is associated with dental problems (Axelsson et al., 1998; Bergstrom and Floderus-Myrhed 1983) with smokers suffering more often from periodontal disease (Yanagisawa et al., 2010; Ziebolz et al.; 2008). Although there appeared to be a tendency to deeper gingival pockets amongst smokers in our study, we are cautious at interpreting this due to the low number of smokers in our cohort (10%). Age may be another factor affecting dental health. Holtfreter et al. (2010) did not find such a correlation in their German collective, and Sobotta et al. (2007) did not correlate their data with the patient's age in their relatively old collective, but Crocombe et al. (2009) found a significant increase of gingival pockets with age. This finding is comparable to ours.

Several studies have found that oral hygiene varies between men and women. Independent of age, women show less periodontal disease and better oral hygiene than men (Abegg et al., 1999; Holtfreter et al., 2010; Ziebolz et al., 2008). Our study confirms these findings. Other factors that may have

Table 3. Prevalence of Gum Bleeding in the German Population

Education/social status	*Prevalence [%]*		
	12 years	*35–44 years*	*65–74 years*
High	3.2	11.3	18.6
Moderate	6.1	14.6	18.7
low	9.2	14.9	14.9

Data from Micheelis and Reich, 1999.

Table 4. Dental Emergency Kit for Trekkers

Minimal content	*Additional supplies for lay persons*	*Additional supplies for physicians*
Temporary cement (e.g., Cavit)	Scalpel (sterile, single use) and 3 cm iodoform gauze (sterile)	2 syringes and 5 needles
Oral mirror	Dentanurse box	Local anesthesia (e.g., ultracaine 1.5%)
Tweezers		Acutenaculum and sutures
Clove oil + cotton pellets		Forceps
Two antibiotics (one broad spectrum and metronidazole)		
10 mL chlorhexidine solution		
Analgesics		

increased the risk for gingival or periodontal disease in our cohort, such as carbohydrate-rich nutrition in the Himalaya regions (Bawadi et al., 2011) or physical factors, such as the cold and dry air that deteriorates the oral flora during periods of more mouth-breathing, should be taken into account.

We found significantly reduced levels of oral hygiene during the trip in our cohort. This is known to produce gingival or periodontal inflammation (Abegg et al., 1999; Loe et al., 1965). Therefore, the daily problems trekkers have to deal with when they take care for oral hygiene such as limited or missing sanitary facilities and (very) cold water should be noted as indirect risk factors.

The general advice to visit a dentist well before departure to remote regions is well established in industrial countries, although data are limited how many travellers follow this advice. In general, women and elderly people seem to accept such advice more readily than younger people and men (Holtfreter et al., 2010; Rack et al., 2005). We found participants with more recent dental check-ups tended to have a decreased risk for dental problems en route.

Most of the problems that trekkers showed en-route could have been treated with the normal medical kit, if the person carrying it had the relevant knowledge. As dental issues are to be expected quite commonly, a more proactive approach for pre-travel advice should be considered:

What type of dental kit should be carried and what type of training in the management of simple dental problems should all potential travellers, but in particular, health care professionals undergo.

With the data presented above, it is highly likely that any physician of any speciality who is doing any trekking will have to manage dental problems. Since there are no comparable data in medical literature and except some few exceptions there is no training for medical students or physicians in dental medicine in the field at all, this may be the most important consequence of the study. With such a high number of potential patients, it is not acceptable that physicians who are going in such regions, especially if they have completed any training in travel medicine, do not have sufficient—if any—knowledge on how to deal with dental problems. Some basic training how to handle inflammatory problems such as gingivitis or periodontitis are essential, as is training on provisional fillings, lost crowns, or fractured or luxated teeth. This implies that a small but adequate emergency kit should be carried along. An example is given in Table 4.

Conclusion

The prevalence of dental problems in trekking travellers is higher than expected. Most problems could easily be managed with a little of training and some specific equipment. The curricula in travel medicine should be changed to include dental emergencies in the wilderness as an integral part of the doctor's training. All travellers should be advised to see a dentist within 6 months of departure and to carry a small dental first aid kit.

Acknowledgments

This study is one of several studies of the ADEMED 2008 Expedition (Aachen Dental and Medical Expedition), which was generously supported by the 2008–2009 Research Award of the International Society for Travel medicine (ISTM). A warm ''Thank you!'' to the Annapurna Conservation Area authorities for their support with detailed data about the visitors of the region!

Author Disclosure Statement

No competing financial interests exist.

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Received October 9, 2013
Accepted in final form November 20, 2013