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Travel medicine issues in the elderly

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Elderly attitude to travel

- **Advancing age is less of a barrier to international travel than at any time in the past.**
- **It is estimated that 500 million travelers cross international boundaries each year. The proportion of elderly among them is increasing.**
- **The conveniences of modern day travel and the increased accessibility of formerly remote or exotic destinations may inspire older travelers to venture farther than they previously thought possible.**



Age and travel

- Even though age alone should not be considered a contraindication to travel, elderly travelers need to know their higher risk of illness, injury or death while traveling.
- Even the healthy elderly has often greater difficulty acclimatizing during travel. Extreme temperatures, humidity, changes in altitude, motion sickness, jet lag, constipation and insomnia represent often a problem that may take longer to be adjusted by them.



- **With advancing age comes a greater likelihood of underlying medical conditions.**
- **Underlying disease may make the older traveler more vulnerable to acquiring travel-related infections, and may increase the severity of these illnesses.**
- **Specific travel recommendations (e.g., malaria chemoprophylaxis; vaccines) may also be affected by the traveler's medical condition and age.**



Vulnerability to diseases increases with age

There are physiological changes in the elderly:

- achlorhydria → increased risk of diarrhoea by cholera, typhoid, giardia
- age-related decline in lung and cardiac function → more prone to hypoxia
- change in the circadian rhythm and environmental stresses → psychological distress and confusion in the elderly



Travel-related illnesses are more severe in the elderly

The elderly are more prone to severe infections and complications following infection with certain pathogens:

- HAV → higher mortality rate (2%) for pts >40 years**
- Typhoid fever → mortality 0.4% in younger people, and 3.3% in people over 50 years of age.**
- Yellow fever, Japanese encephalitis, pneumococcal infection or influenza → higher mortality rates in the elderly**
- Malaria is more severe in old people; mefloquine use for prophylaxis should be carefully considered in pts with cardiac conduction defects.**

Coexisting medical illnesses and elderly travellers

- **Elderly people are more likely to have coexisting medical illnesses that may represent a risk for health difficulties during travel, including cardiovascular disease, respiratory disease, and diabetes.**
- **Drug interactions with antimalarials and other prophylactic medications should be considered for elderly pts on medications.**
- **Older people are more prone to falls and other injuries**

Should patients with a hip or femur fracture sustained abroad be repatriated for surgery?

A study from Switzerland

Table 5: Outcome six months after surgery.

| | Surgery abroad | | Surgery in CH | | p | |
|--------------------------|----------------|----|---------------|----|-------|------|
| | n | % | n | % | | |
| Overall complications | 18 | 64 | 23 | 37 | 0.01 | |
| Reoperation | 7 | 25 | 5 | 8 | 0.03 | |
| Walking ability impaired | 24 | 89 | 35 | 57 | 0.004 | |
| Uses walking aid | 15 | 56 | 21 | 34 | 0.06 | |
| Analgesics | None | 11 | 41 | 39 | 65 | |
| | Sometimes | 10 | 37 | 8 | 13 | |
| | Regularly | 6 | 22 | 15 | 22 | 0.03 |

Table 6: Predictors of complications (multivariate analysis with logistic regression).

| | | Overall complications | | Reoperation needed | | Walking impaired at six months | |
|------------------|------------------------|-----------------------|------------|--------------------|------------|--------------------------------|------------|
| | | Odds ratio | CI 95% | Odds ratio | CI 95% | Odds ratio | CI 95% |
| Place of surgery | Switzerland | 1.00 | Ref. | 1.00 | | 1.00 | |
| | Abroad | 4.50 | 1.55–13.07 | 7.58 | 1.39–41.25 | 3.93 | 1.10–14.11 |
| Age | <65 yr | 1.00 | | 1.00 | | 1.00 | |
| | 65–74 yr | 1.34 | 0.43–4.21 | 1.43 | 0.24–8.45 | 0.99 | 0.30–3.28 |
| | 75 yr and older | 0.55 | 0.16–1.89 | 0.40 | 0.05–2.95 | 1.27 | 0.35–4.67 |
| Countries | Europe Rest / Overseas | 1.00 | | 1.00 | | 1.00 | |
| | Europe South / North | 1.38 | 0.51–3.71 | 0.72 | 0.15–3.38 | 0.34 | 0.11–1.06 |
| | Africa | | | | | | |
| Type of fracture | Femur shaft | 1.00 | | 1.00 | | 1.00 | |
| | Med hip neck | 1.10 | 0.32–3.72 | 0.23 | 0.04–1.40 | 0.35 | 0.09–1.39 |
| | Peritroch femur | 1.15 | 0.34–3.91 | 0.22 | 0.04–1.30 | 0.62 | 0.15–2.58 |
| Reduction in ADL | No | 1.00 | | 1.00 | | 1.00 | |
| | Yes | 1.37 | 0.53–3.53 | 1.12 | 0.26–4.91 | 2.62 | 0.90–7.65 |

Causes of death in travellers

- While pre-travel assessments tend to focus on the prevention of travel-related infections, it is important to realize that only 1–3% of deaths in travelers are attributable to infectious diseases.
- The majority are due to natural causes – mostly cardiovascular disease – or trauma.
- Evaluation of an individual's overall fitness for travel should be performed by the individual's own physician prior to travel.
- This is particularly true for the older traveler, especially if the agenda includes a marked increase in physical activity.
- The pre-travel visit provides an opportunity to address these issues, and to offer practical advice that can minimize the chance of illness and injury and contribute to an enjoyable travel experience.

MEDICAL CONDITIONS ARISING DURING TRAVEL

- **Motion sickness**
- **Thromboembolic disease (economy class syndrome) → affect younger age groups**
- **Hyperthermia and hypothermia**



Specific medical problems

Cardiac disease

- Cardiac events are one of the most common causes of death among adult travelers. Cardiovascular events are also the second most frequent reason for medical evacuation, and cause over 50% of deaths recorded during commercial air travel.**
- Travelers with underlying cardiac disease should undergo a pre-travel examination to optimize cardiovascular status and define preventive measures, including any in-flight oxygen requirements.**

Specific medical problems

Cardiac disease

- Cardiovascular contraindications to air travel include recent myocardial infarction (MI) (uncomplicated MI within last 2 weeks; complicated MI within the last 6 weeks), unstable angina, and poorly controlled CHF, arrhythmia or hypertension.**
- Prior to departure the traveler should obtain names of specialist physicians in the cities to be visited in case complications arise. Some drugs that prevent or treat malaria may interfere with cardiac medications or may be contraindicated due to an underlying medical condition.**

The safety of aeroplane travel in patients with symptomatic carotid occlusion

- **67 patients with symptomatic carotid occlusion travelled by aeroplane to a single PET centre (174 flights). The average age was 58.7 ± 1.4 years.**
- **27 patients (35.1%) demonstrated evidence of ipsilateral haemodynamic cerebral ischaemia as measured by PET OEF, while 50 (64.9%) had normal OEF.**
- **Patients flew an average distance of 418.9 ± 25.9 miles for 107.1 ± 4.7 min per trip.**
- **No patient reported symptoms of a transient ischaemic attack or stroke during or within 24 h after aeroplane travel (95% CI 0% to 2.0%).**

Respiratory disease

- There are many published recommendations for patients with chronic respiratory disease considering air travel.
- Arrangements for in-flight oxygen can be made through contact with the individual airline.
- Pulmonary contraindications to air travel include dyspnea at rest, cyanosis, active bronchospasm, pneumonia, and pulmonary hypertension.

Renal disease

- **Travelers with end stage renal disease (ESRD) need a prevention and management plan for diarrheal illness; particular emphasis must be placed on fluid management since dehydration may worsen renal failure.**
- **Empiric treatment for travelers' diarrhea, with dosage adjustments based on creatinine clearance, should be provided, along with strict instructions, on when to seek medical help.**
- **With sufficient notice, dietary restrictions for individuals with renal disease can often be accommodated with the assistance of airlines, hotels and tour operators.**

Renal disease

- **ESRD on dialysis does not affect the metabolism of mefloquine.**
- **Proguanil is excreted by the kidney and dose reduction may be needed. This is a problem for patients on atovaquone/proguanil chemoprophylaxis.**



Diabetes

- **Travel results in unaccustomed exertions and interruptions in routines and meals.**
- **Diabetic patients on travel can usually anticipate or avoid serious problems by thinking things through in advance.**
- **Prior to departure they should receive special instructions on the management of diarrhea, nausea and vomiting.**
- **It is unwise for these travelers to rely on foreign purchased medications; therefore, they should carry an adequate supply of everything required for diabetes care.**

Allergies

•Those with life-threatening food allergies should learn how to say what they are allergic to in all the countries that they will transit. As well, they should carry pictures of the ingredient or food to be avoided.

Gastrointestinal disease

•Travelers with decreased gastric acid due to surgery or medications have lost an important defense against food and water-borne illness. They are more susceptible to illness since a smaller inoculum of pathogens is more likely to cause disease.

•Travelers with IBD may experience problems if they acquire food-borne or water-borne infections.

Use of anti-malarial drugs and the risk of developing eye disorders[☆]

Table 4 Association between anti-malarial drug exposure and eye disorders stratified by timing of exposure.

| Exposure type | Cases (%) | Controls (%) | OR (95% CI) | Adj. OR (95% CI) |
|-----------------------|------------|--------------|------------------|------------------|
| Unexposed | 290 (44.5) | 1960 (50.2) | 1.00 (reference) | 1.0 (reference) |
| Mefloquine | 83 (12.7) | 430 (11.0) | 1.32 (1.00–1.73) | 1.33 (1.01–1.75) |
| Current | 22 (3.4) | 158 (4.0) | 0.93 (0.58–1.49) | 0.92 (0.57–1.48) |
| Past | 61 (9.4) | 272 (7.0) | 1.53 (1.12–2.10) | 1.56 (1.14–2.14) |
| Chloroquine/Proguanil | 33 (5.1) | 134 (3.4) | 1.70 (1.12–2.56) | 1.61 (1.06–2.45) |
| Current | 6 (0.9) | 41 (1.0) | 0.95 (0.39–2.30) | 0.94 (0.38–2.31) |
| Past | 27 (4.1) | 93 (2.4) | 2.03 (1.28–3.22) | 1.90 (1.19–3.04) |
| Atovaquone/Proguanil | 242 (37.1) | 1349 (34.5) | 1.22 (1.01–1.48) | 1.25 (1.03–1.52) |
| Current | 53 (8.1) | 360 (9.2) | 1.01 (0.73–1.39) | 1.04 (0.75–1.43) |
| Past | 189 (29.0) | 989 (25.3) | 1.32 (1.07–1.63) | 1.34 (1.08–1.66) |
| Mixed exposure | 4 (0.6) | 35 (0.9) | 0.81 (0.28–2.31) | 0.83 (0.29–2.37) |

OR: odds ratio; adj. OR: odds ratio adjusted for smoking, BMI, diabetes, depression, hypertension, sleeping disorders, use of systemic corticosteroids and use of oral contraceptives; 95% CI: 95% confidence interval.

Follow-up study with a nested case-control analysis using the General Practice Research Database to compare the risk of developing a first-time diagnosis of an eye disorder during exposure of mefloquine, chloroquine and/or proguanil or atovaquone/proguanil use to non-users

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General advice for the elderly on travel

- She/he should plan her/his trip well ahead of time, decide what kind of trip to take, and make sure the destination is safe and that no travel advisories have been issued.
- When booking→ make sure that any special requests can be adequately accommodated; ask about supplemental health insurance (caution limitations and exclusions prior to purchase)
- Check your current health insurance (out-of-country expenses? Repatriation costs?)

General advice for the elderly on travel

- In case of medication allergies or underlying medical conditions → medical bracelet.
- General physical examination before the trip
- If required, a travel medicine specialist should be consulted 4 weeks prior to departure (to allow adequate time for immunization).



General advice for the elderly on travel

- Take a first-aid kit. Take medication prescribed for prophylaxis (eg malaria).
- Carry any prescription medications with you (not packed in the checked baggage).
- Carry your personal physician's phone and any relevant medical records with you



General advice for the elderly on travel

- Acclimatize gradually to heat, cold, and altitude.
- Drink adequate fluids, drink alcohol judiciously
- Seek medical attention in case of sickness during your trip or after your return home.
- Inform your physician of your recent travel, the places you visited and all the details of your trip



KEYPOINTS

- **Cardiovascular disease and accidental trauma are the leading causes of death among older travelers**
- **Older travelers should plan their trip, have their fitness for travel assessed, and seek proper travel health advice well ahead of travel**
- **All older travelers – regardless of their health – should have adequate health insurance to cover medical and repatriation costs while abroad**
- **Recommended vaccines may be less immunogenic in the elderly, and the protective efficacy of many travel vaccines is unknown in this population**

Croatia is a safe tourist destination – study of foreign citizen mortality in Splitsko-dalmatinska and Primorsko-goranska County during the period 2001-2010

Bečić K et al. Croat Med J 2013;54:291-5

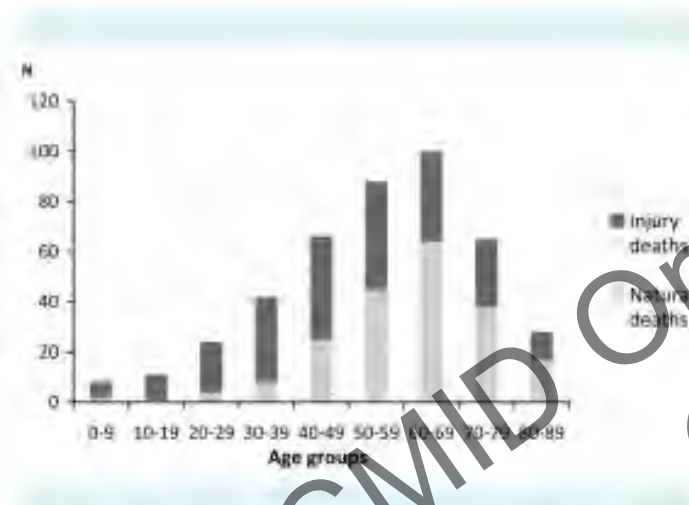


TABLE 2. Standardized mortality rates of foreign citizens by country in the period 2001-2010

| | Mortality rate per country | Number of entrances | Number of deaths | Expected number of deaths | Standardized mortality ratio | Mortality rate of foreign citizens per nationality in presented population sample |
|----------------|----------------------------|---------------------|------------------|---------------------------|------------------------------|---|
| Croatia | 8.73 | | | | | |
| Germany | 6.31 | 3 209 177 | 61 | 202.50 | 0.25 | 1.59 |
| Austria | 6.01 | 1 623 278 | 29 | 100.56 | 0.29 | 1.73 |
| Czech Republic | 7.95 | 1 786 042 | 24 | 141.99 | 0.17 | 1.34 |
| Italy | 5.34 | 2 484 407 | 32 | 132.67 | 0.24 | 1.29 |
| Hungary | 10.03 | 966 037 | 16 | 96.90 | 0.17 | 1.66 |
| Poland | 8.99 | 911 826 | 15 | 81.97 | 0.18 | 1.65 |
| Slovakia | 9.36 | 787 928 | 22 | 73.75 | 0.30 | 2.80 |
| France | 5.66 | 829 444 | 11 | 46.94 | 0.23 | 1.33 |
| UK | 6.43 | 436 760 | 8 | 28.08 | 0.28 | 1.83 |
| USA | 7.46 | 271 512 | 7 | 20.25 | 0.35 | 2.58 |
| Netherlands | 6.03 | 355 982 | 5 | 21.47 | 0.23 | 1.41 |

*WHO mortality rate for citizens of each country in their homeland (10).

FIGURE 1. Age, number of deaths, and cause of death among foreign citizens in Splitsko-dalmatinska and Primorsko-goranska County in the period 2001-2010.