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IN-DEPTH REVIEW

Medical aspects of expatriate health: health threats

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The globalisation of business activity can lead to the movement of key employees and their dependants from country to country. In their host country these expatriates often face health hazards not experienced at home. This paper describes the range of health issues of relevance to expatriates.

Key words: assignment; expatriate; mental health; travel related illness.

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WHAT IS AN EXPATRIATE?

There is no accepted definition of an expatriate to distinguish him/her from a traveller. However, an expatriate has been described as someone who has taken up or intends to take up residence in a foreign country for a period of 6 months or longer.[1,2] Compared to the material published on health issues of short-term travellers there is little written about expatriates. Most pre-travel advice appears to be targeted towards the short-term traveller.[2] It is hoped that newer data collection systems, which attempt to ascertain risk factors and morbidity based on travel purpose and type of traveller, might increase knowledge about health risks for expatriates compared to those of the short-term traveller.[3]

It appears that a high proportion of travellers experience health problems. In a Swiss study, 37.9% had symptoms and 14.4% were incapacitated as a result.[4] In a study of Swedish travellers, almost half experienced an illness related to their travel.[5] In the US, 12% of corporate travellers sought medical attention for their travel related medical problems.[6]

Many illnesses seen both in travellers and expatriates are more frequent in the expatriate group. This relates to the longer period of exposure and has been demonstrated for viral hepatitis,[7,8] protozoal enteric infections[9] and typhoid.[10] However, for diarrhoeal illnesses a longer stay in the country can confer protection, with less cases of diarrhoea[11] and fewer isolates of pathogens in stool testing.[12]

Short-term travellers may travel for reasons of business or pleasure and, if the latter, often engage in hedonistic behaviour which might increase their exposure to health hazards, albeit over a short period of time. In the context of this paper, the expatriate is deemed to live overseas for occupational reasons and although for a longer duration their exposure intensity is likely to be different to that of the short-term traveller.

It is convenient to consider the expatriate in terms of their home country (their usual place of domicile) and their host country (the country to which they have been assigned and where they will live). It is not unusual for expatriates to move from one host country to another and assume the status of a 'professional' expatriate. This is often brought about by the expatriate employee demonstrating skills in a location outside their home country, but there is also the more negative aspect of the employee losing contact with the company at home, being kept in employment only through movement from one expatriate assignment to another.

If the expatriate is assigned to a developed country, e.g. western Europe, North America, Australasia, their exposure to additional health risks is likely to be slight and the consequence of their existing health risks becoming manifest as illness are less problematic as the medical infrastructure they will have access to is likely to be good.

It is important to realize that there can be medical problems for the expatriate originating from a developing country who moves to a developed one. For example, someone from a malarious area who moves to a non-malarious area will, if their stay is long enough, lose their semi-immune status to malaria and, whilst it will be recovered upon re-exposure, it is an important consideration when the expatriate assignment comes to an end and exposure to malaria starts again. Cardiovascular disease risk factors are also influenced by cultural exposure.[13,14] In practice, expatriate health issues are more important with a move from a developed to a less developed country and this paper will mainly deal with this scenario.

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ACCIDENTS

By far the greatest health risk to the expatriate is accidents, particularly road traffic accidents.[1,15] In one report, nearly a third of repatriations amongst German workers was due to injuries sustained during road traffic accidents.[2] The standard of driving, safety of vehicles, state of roads and street lighting can be very poor in developing countries and this, together with the likelihood of subsequent poor medical care (e.g. poor ambulance services, poor hospitals), poses a very serious problem to the expatriate and his/her family. Because of the high risks of road traffic accidents seat belts must be worn at all times. It is not uncommon that cars in some countries are not fitted with rear seat belts and this deficiency should be corrected. To some extent, the expatriate can be safeguarded from road traffic hazards by having a driver who will know local traffic conditions.

Other accidents that are more common amongst expatriates include those associated with recreational activities such as water sports. These pursuits may be taken up with little or no training, which, together with inexperience of tide and currents, can increase the risks of drowning.[1]

Safety hazards are also a potential problem with the increased air travel that normally goes with expatriate status.[16]

SECURITY

Expatriates may be the targets or victims of muggers or kidnappers. In extreme situations, expatriates have been caught up as detainees in major conflicts following which many health issues have been identified.[17]

CLIMATIC FACTORS

An expatriate may experience extremes of climate to which they are not accustomed.[18] This can include extremes of temperature and humidity. Exposure to extremes of cold can lead to a range of cold injuries, e.g. frost bite. Extremes of heat can lead to heat illnesses, e.g. heat stroke, and pre-dispose to skin conditions such as prickly heat and tinea. Acclimatization to heat can reduce the metabolic and thermoregulatory problems of exposure to high temperatures but acclimatization to lower temperatures is less likely.

WATER QUALITY AND FOOD HYGIENE

In many parts of the world water is not potable from the tap and can be the source of faecal–oral diseases. The resultant diarrhoeal diseases are the most common reported illness in travellers.[6,19–25] Likewise, the endemic nature of gastrointestinal disease in the local population and poor catering infrastructure can also lead to an increased incidence of gastrointestinal disease amongst expatriates. Diarrhoea has been shown to occur more frequently in expatriates who eat out rather than cater for themselves.[11] Although usually a self-limiting disease, travellers' diarrhoea can affect the expatriate's health in other ways, such as the reduced absorption of some antimalarial drugs.[26]

AIR QUALITY

In remote locations air quality may be better than in the expatriate's home country and this might have a positive impact on chronic respiratory conditions.[27] However, air quality can be poor. This is often due to poorly maintained road transport vehicles, poor control of emissions from industrial processes and the use of solid fuel for domestic heating.

In many parts of the developing world the main fuel for petrol driven cars is leaded gasoline. This not only increases environmental lead exposure but also contributes to other air pollutants from motor vehicles which, by definition, would not be fitted with a catalytic converter.

Lead exposure through various sources has been considered a problem in eastern Europe but it is not thought that medical surveillance is required for travellers and expatriates exposed in this way.[28]

BEHAVIOURAL AND PSYCHOSOCIAL FACTORS

Psychological suitability for expatriation and mental health during deployment will have a large impact on the chances of a successful overseas assignment. Selection and preparation of expatriates to reduce wastage from psychological morbidity is discussed in the paper by Dow [pp. 579–582]. The evidence for expatriate mental ill health is considered here.

Considerations of psychosocial aspects of expatriation have been covered in several publications.[1,2,29] Even though there have been recent publications on psychological aspects of business travel,[30] it has been acknowledged that there is a paucity of literature in the medical and psychiatric journals on this subject for expatriates.[31] The review of Foyle *et al.*[31] notes that there is a consistently high incidence of affective and adjustment disorders amongst expatriates during their assignment.

Perhaps the most comprehensive and up-to-date review of psychosocial and psycho-physiological aspects of foreign assignment has been published by Anderzen.[32] In this thesis she also presents research conducted by both herself and her co-workers. The review section of the thesis describes the increasing 'internationalization of work' which has resulted in individuals and families undertaking many expatriate assignments. For various reasons many of these assignments fail. Premature return rates for expatriate assignments originating from Europe are between 5 and 15% and in the United States as high as 40%. Problems with adjustment to an expatriate assignment account for the highest proportion (60%) of these

assignment failures. Only 10% of assignment failures are due to a technical inability to perform the job.[33]

Non-work stressors include what has been referred to as the 'cultural distance' between the home and host country. Negative attitudes amongst expatriates increase in proportion to the greater cultural distance. This can be considered as 'culture shock'.[34] Factors influencing the adaptation to different cultures include many aspects of the host country (e.g. language, politics, climate, political stability), culture (attitudes, values, status of women), facilities (housing, transport, schooling, sanitation) and, for the employee, job factors (level of responsibility, attitude of colleagues, work schedule).[2]

Family adjustment is an important influence on the success of an expatriate assignment. This has been noted where good family support, communication and adaptability are related to successful expatriate adjustment.[35] As a sub-set of the family, the spouse is an important non-work factor both during the assignment itself and when coping with readjustment on repatriation.[32]

At work, role clarity, role discretion and satisfaction with compensation and benefits associated with the assignment are likely to be positively related to good adjustment. Similarly, if the assignment is considered as a career advancement this will improve the chances of a successful assignment. Role conflict within the assignment is negatively associated with adjustment.

Amongst the strongest influences on adjustment to the expatriate assignment are the individual's characteristics and coping skills. Increasing age is positively related to a good outcome as are good technical and diplomatic skills, flexibility and adaptability. This has also been noted in the context of culture shock.[2] Previous experience of expatriate assignment is positively related to good adjustment. This may be a survivor phenomenon.

Albeit not related to expatriation *per se*, there may be gender differences in response to travel related stresses, which could be relevant to expatriation. It has been reported that women were more worried than men regarding travel related stresses[36] but this was not found in a study of business travellers.[30]

The original research presented by Anderzen and co-workers is novel in that it comprises a series of reports based on a prospective study of a relatively large group of expatriate employees and spouses. The study group was reasonably well matched to a reference group who did not expatriate. Follow-up of the expatriate group was for up to 3 years. The study achieved good compliance and response rates to the questionnaire survey and medical assessments applied to the study and reference populations.

During the first 6 months of the study period an interesting finding was that, although the employee was more positive to the assignment before it took place, this was not borne out by experience as the employee's sense of well-being decreased during the first 6 months of the assignment. The perception of well-being of the spouse was, against expectations, better than that of the employee. Culture shock was not universal and depended on individual characteristics such as internal locus of control and previous experience of life events.

The study progressed into observations over 1 year, this time looking at employees on assignment, compared to the reference group in the home country. There was a clear demonstration of adverse reactions to the assignment. This included measurements of psycho-physiological reactions with increased levels of circulating prolactin (a 'stress' hormone). Substance abuse also increased (alcohol and cigarettes). This has been noted in other publications.[1] It could be inferred that use of illicit drugs or inappropriate use of prescription drugs is also a potential problem. Individual characteristics were once again found to be very important in determining adjustment. These included internal locus of control, self-esteem and social support. They appeared to modify the stress response and predict the employees' ability to adjust to foreign assignments.

Another finding from Anderzen's prospective study was that the longer the assignment, the greater the negative attitudes while away. This was only realized during expatriation itself, as prospective expatriates did not have negative attitudes before their assignment, even though they knew the length of the assignment before departure. Readjustment on repatriation was also found to be worse the longer the assignment.

Other evidence for psychosocial problems associated with expatriation has been found in development workers. Chronic fatigue syndrome is found in returning overseas development workers.[37] Perhaps predictably, Peace Corps volunteers have psychological problems returning home after emergency evacuation.[38]

Other studies have recorded the particular characteristics of mental illness which relate to the expatriate lifestyle[39] and in those who present with psychiatric problems in a tropical diseases unit.[40]

The same psychosocial symptoms, e.g. withdrawal, sleep disturbance and low affect, are likely to have a different clinical significance depending on when during the assignment they occur. It might be quite normal for an expatriate to feel some adverse psychological symptoms during the first 6 months of the assignment, as this would be consistent with the adjustment they are in the process of making. However, if such symptoms are present 2 years into an assignment this indicates either chronic maladjustment to the assignment (i.e. if the symptoms have not gone away since the start of expatriation) or the development of new problems if the symptoms are occurring for the first time.

SEXUAL HEALTH

A study from the Netherlands showed that 23% of expatriates had unprotected sex with partners from HIV endemic areas.[41] In the UK, the figure for unprotected sex whilst abroad was even higher at more than 60%.[42] In the UK, 25% of new cases of heterosexually acquired HIV resulted from exposure while overseas.[43] However, not all reports suggest such a high risk.[44] A Belgian study has quantified the risk factors for HIV infection in expatriates by type of contact.[45] In short-term travellers it has been shown that sexual promiscuity is not a feature

of the travel *per se*, but is due to pre-existing attitudes towards sexual activities.[46]

The expatriate will need to understand the higher prevalence of HIV and other sexually transmitted diseases in the host country compared to their home country. Sero-positivity for HIV in many sub-Saharan countries is as much as 4.5% in ante-natal surveys[47,48] and as high as 30–40% in commercial sex workers.[47,49] For a married expatriate, the risks associated with casual sex are likely to be determined by whether they are accompanied on the assignment with their partner or whether they are 'single at post'. Being accompanied by one's partner will have a stabilizing influence on behaviour, whereas the isolation of being a 'single at post' could increase the likelihood of sexual contact as well as substance abuse and psychological problems associated with the break up of normal family life.

OCCUPATIONAL HEALTH RISKS

Obviously, all the expatriate's new health risks can be considered to be occupational in nature (they are expatriates because of their job), but more conventional occupational health hazards (e.g. chemical, physical, ergonomic, biological) may be experienced. Work in remote locations may involve use of helicopters with exposure to noise and vibration. Exposures to 'familiar' hazards may be less well controlled than the employee may have enjoyed in the past and hazards no longer routinely experienced in developed countries may be prevalent, e.g. asbestos, benzene. Opportunities for, and the quality of, health surveillance may be less.

The pattern of work, such as shift cycles and leave arrangements, can either create new occupational health risks or influence others. Although not truly an expatriate posting there is a large group of so-called 'rotator' workers who often work overseas on a 4-week on, 4-week off basis. During their 4 weeks at work it is common for them to work 12-hour shifts, 7 days per week. This has obvious potential consequences as far as psychological stress is concerned and is also important in terms of observing occupational exposure limits, most of which are devised on an 8-hour/5-day week exposure basis. The extra duration (and possibly intensity) of exposure during the 4 weeks on, may not necessarily be compensated for by the 4 weeks off.

A particular occupational health risk for medical personnel is hepatitis B.[8]

It is the employer's responsibility to manage all health risk to which the expatriate is exposed, to an adequate level and certainly as far as is reasonably practicable.[50] A risk assessment for both occupational and location related health issues should be used.[51]

LOCATION SPECIFIC EXPOSURE TO TRANSMISSIBLE DISEASES

Many of these travel related illnesses have been covered in detail in another paper in this series so only a basic summary will be given here. The epidemiology of local health problems needs to be studied to determine the level of risk and therefore protection. The risk assessment will need to take into account the length of the employee's assignment and the location in which they live. For instance, for a relatively short-term assignment, even in a country in which hepatitis B is endemic, immunizing against hepatitis B may not be indicated but it would certainly be needed for a long term expatriation where the period of risk is greater. This opportunity should not be missed.[52] Illness risks are not only determined by location and length of stay but also by the age of the expatriate. Children are often less wary of stroking what they think of as friendly furry animals (!) and the risk of contracting rabies is likely to be higher, especially in a highly endemic area, e.g. Indian subcontinent.

In some countries, e.g. those of the former Soviet Union, there has been a resurgence of infectious diseases not experienced for several years. Outbreaks of diphtheria in Russia is an example, and requires consideration of adult diphtheria immunisation which is not common practice in most developed countries.[53]

The most significant illness for many tropical areas is malaria. Other diseases include onchocerciasis, schistosomiasis, dengue, typhoid and various types of viral hepatitis. To varying degrees, many of the diseases are preventable.

Anti-malarial chemoprophylaxis is associated with well documented adverse affects and in recent years mefloquine (a very effective drug in areas where there is chloroquine resistance) has attracted much comment.[54] Fears of adverse effects of long-term anti-malarial use have influenced compliance rates with 48.4% of long-term expatriates taking either no or inadequate chemoprophylaxis against malaria.[55] Poor compliance with malaria prophylaxis may also be influenced by advice received by the expatriate on arrival at the host country. This can come from fellow, more experienced, expatriates and local medical advisers. Expatriates should be advised to ignore any 'helpful' advice received locally and follow what they receive in their home country.

The development of long-term ophthalmic complications from use of chloroquine is only likely to occur after many years of use, as most side effects of chloroquine (for malaria chemoprophylaxis) have occurred during its use with rheumatic diseases where the overall dose and the dose rate are different to that experienced during prophylaxis. In practice, ophthalmic problems should not occur.[56]

POSSIBLE CONSEQUENCES OF POOR MEDICAL INFRASTRUCTURE

One of the greatest concerns of expatriates is the lack of access to good quality medical facilities. Only 50% of American travellers seeking care for diarrhoeal illness felt the treatment they received was beneficial.[2] However, another United States study of travellers found that the quality of health care was less important to the traveller

than the personal and family disruption that came with travelling.[30] This relative lack of concern might be because they were only potential users of health care facilities and had no direct experience of them.

Not only is medical care likely to be poor, but so is access to dental treatment. Dental health is often neglected by expatriates but can be the cause of personal and business disruption.[57] Even in remote locations in the developed world medical evacuation for dental health problems is significant.[58]

Owing to the high prevalence of HIV sero-positivity mentioned above, access to 'safe' blood can be poor. The writer has visited a 600-bed hospital in southern Africa (which incidentally had 1200 in-patients) where the blood bank had a total of only 6 units of blood available for transfusion.

Ambulance services are often underdeveloped, with public hospital ambulances being just a method of transporting patients with little in the way of facilities on board and no trained personnel to administer medical aid. Ambulances in the private sector are often better equipped and better staffed.

In addition to inadequate clinical care, exposure to the medical infrastructure in some countries can increase the risks to developing further medical problems. The most significant being blood-borne pathogens if there is reuse of disposable intravenous equipment and/or where there is inadequate screening of blood for transfusion.

It is the writer's experience that a significant difference between medical care in the developed world and the developing world is the quality of nurse training. Nursing deficiencies are often quickly perceived by the expatriate patient.

SPECIAL GROUPS

There are additional problems that might occur with specific expatriate groups. These include the non-working partner, children, those with disabilities, pregnant women, those who have chronic illnesses, and the immunocompromised.

Problems for the non-working partner

An expatriate is not always a worker. He or she may be a non-working spouse. The difficulties for the non-working partner will be exacerbated if they have had to abandon a specific career in their home country. Even by itself, this would be a sacrifice and it is brought into sharp contrast by the absence of a job overseas. However, the concept that the spouse is normally more susceptible to decreased well being was not observed in the prospective study of Swedish expatriates. This study found that the working partner reported a greater reduction of well being after the first 6 months abroad than did their spouse.[32]

Children

Useful reviews of health issues associated with children and international travel have been published.[59,60] Expatriate children pose particular problems. For example, their less well developed immune system means that they are more prone to respiratory infection than their expatriate parents.[61] Age-related risks include being prone to accidents during play activities and possible poor compliance with anti-malarials. Parents need to be aware that the natural history of illnesses in children may differ from that in adults. This might be particularly important when determining the threshold at which to seek medical opinion in the event of diarrhoeal illnesses. Children also appear susceptible to psychological problems on return to their home country.[29]

Disabled persons

Extra care is required when considering a disabled person for an expatriate assignment outside of their more supportive home environment. This should be possible to do within the spirit of the anti-discriminatory legislation of both the home and the host nation.

Pregnancy

The risks facing the pregnant expatriate have been reviewed.[62] A woman contemplating pregnancy will have to consider the potential problems of conceiving when living in a developing country. If in a malarious area, concurrent use of malarial chemoprophylaxis will need to be considered in light of the usual practice to avoid medication during the first trimester. At least as far as the choice of anti-malarial medication is concerned, there seems to be little difference between pregnancy problems with those drugs commonly taken.[63,64] There is little information available on other anti-malarials.[65] Doxycycline is unsuitable for use during pregnancy.

Chronic illnesses

The cardiac event in an expatriate, which would have occurred on a certain date regardless of location, will this time happen in a different country perhaps with poor medical facilities. Such events represent the most common and unpredictable illness problems for the adult expatriate.[66] In some situations, however, the medical status of the expatriate can be improved, e.g. fewer symptoms from musculo-skeletal problems in a warm climate.[27]

Certain chronic conditions, e.g. diabetes, epilepsy and asthma, can be stable and relatively easy to deal with in the home environment but more troublesome and also more difficult to treat in a location in the developing world. This is due to a combination of direct exacerbation from living conditions (e.g. air quality and asthma) and poor medical follow-up (e.g. no access to laboratory services for anticonvulsant levels in epilepsy).

It has been shown that diabetic regulation is impaired during travel, and although it is possible that the more stable lifestyle of an expatriate could minimize such problems, it should still be considered.[67]

Immunocompromised

A limited study of Dutch subjects has shown that HIV infected travellers have a higher rate of medical consultation for what is possibly travel related illness.[68] The medical problems of those persons compromised for other reasons have been reviewed.[69,70]

CONCLUSION

This review of health threats to expatriates supports the need for the careful selection of potential expatriates before assignment and support mechanisms for them during and after their assignment. These aspects are covered elsewhere in this series.

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