

Travel Concerns For Congestive Heart Failure (CHF) Patients

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Citation

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Abstract

BACKGROUND

Congestive heart failure (CHF) is chronic inability of the heart to maintain an adequate output of blood from one or both ventricles of the heart to meet the metabolic demands of the tissues. With a markedly weakened left ventricle or right ventricle or both, the volume of blood presented to the heart is in excess of the heart's capacity to move it along. Consequently, fluid builds up behind the heart, as a result of which there is a shift of large volumes of blood from the systemic circulation into the pulmonary (lung) circulation. Despite availability of new therapies, the prevalence of heart failure and hospital admission rates have increased and the World Health Organization (WHO) has recognized heart failure as an epidemic condition in this century.^{1,2}

CHF and climate: Increase in hospitalization for heart failure with peak in the winter/spring seasons has been reported as a consequence of cardiac decompensation in cold weather.^{1,3} Recent studies have shown that cardiovascular tissues are the most sensitive to environmental chemicals and pollutants.⁴ This can induce blood pressure changes, tissue inflammation, autonomic imbalance, blood coagulation disorders, and heart rate variability, resulting in increased admissions for heart failure.^{5,6} Temperature reduction, such as when going to a place with colder climate, can cause physiological changes due to increased heart rate and total peripheral resistance with increased afterload, decrease in water loss by transpiration and perspiration leading to change of total extracellular volume.⁷ All of this leads to increased levels of hypertension, higher rates of myocardial infarction and acute arrhythmia. So, it is recommended that dose modification of various cardiac drugs should be done accordingly.

Patients with LV dysfunction have a delicate balance between preload reduction and relative hypervolemia to augment cardiac contractility and maintain tissue perfusion. This balance gets disturbed on travel to the tropics. For instance, let us compare London (Heathrow) with western maritime climate and New Delhi (SafdarJung) with dry tropical climate. The 24-hour temperature averaged for the entire year is 11.0 °C and 25.0 °C, respectively.^{8,9} The average humidity levels in this part of the world are also lower, especially during the summers. Patients from cooler climates on traveling to tropical areas have greater insensible losses of fluid (as high as 1000-1200 ml/24hr) due to increased sweating and loss via the lungs, and also face the onslaught of traveler's diarrhea.¹⁰ Thus they become relatively dehydrated. Patients, who were previously maintaining well on maximal doses of ACE inhibitors and diuretics, are unable to maintain adequate cardiac output when they continue on the same drug dosage as before in this state of hypovolemia and hence renal perfusion pressures fall due to the effect of these drugs. As a result, they often present with pre renal azotemia and sometimes acute renal failure, often requiring prolonged hospitalization. So, dosage adjustment of these drugs should be made on travel to warmer climates. A similar phenomenon is seen when patients are discharged from temperature controlled hospitals into the hot tropical weather outside.

CHF AND ALTITUDE

One of the most important problems for travelers with congestive heart failure is altitude. In general, patients whose symptoms are poorly controlled should not travel on airplanes. All patients who have congestive heart failure should first consult their doctors before traveling but as a general rule, should be able to walk 100 yards and climb 12

steps if they are to attempt a long plane flight.¹¹ Heart failure patients may also be particularly susceptible to the symptoms of altitude sickness, which may include shortness of breath and profound fatigue. In general, patients with congestive heart failure should avoid traveling to locations at high altitudes.¹²

Travelers with congestive heart failure should carry a list of their medications using the generic name for each drug. It is also important to bring extra medications and store them in carry on luggage for the flight. A baseline electrocardiogram and the name and address of the patient's treating physician should be carried. A brief letter from the patient's physician describing the traveler's medical problems will be very helpful to the evaluating physician. Cardiac pacemakers and implantable defibrillators are safe to fly with and will not be affected by airline metal detectors. Those travelers with pacemakers should carry a copy of their electrocardiogram both in the 'off' (generally after a magnet has been applied) and the 'on' position. Travelers taking diuretics should be particularly careful about their salt intake. It will often be difficult to determine the salt content of foods in other countries. Diuretics may also make patients with congestive heart failure susceptible to dehydration. They should rest frequently and avoid overexertion particularly in hot climates. Patients on blood thinners like coumadin need to watch their intake of green leafy vegetables and other foods that contain Vitamin K, as these can affect the effectiveness of the medication. The goal is to consume about the same amount of Vitamin K as you do at home.¹²

Modern airplanes are pressurized and oxygen content in the air is not the problem. In general, one must consider the "stress" of the journey in relation to the person's heart condition. If his heart failure is not stable and well controlled, the patient should not take any sort of non-local trip. If the person has an arrhythmia, which is not currently well controlled, again, no trip should be taken. What is really important in a stable CHF patient is how long the flight lasts. This determines how long the person will have to sit. Prolonged sitting may increase the chance of blood clots in legs. Any interference with therapy should also be considered. For instance, if diuretics are being taken, the person concerned may have to visit the washroom more often during the trip and this convinces many people with CHF not to take their diuretic that day, which is not advised.¹³

The NIH (National institute of health) and NHS (National health survey) have consistently issued guidelines regarding travel to the tropical countries relating to various communicable diseases. Thus we want to reassert the importance of dose modification and certain precautions as discussed above to be taken in such patients.

The above mentioned text is based on observations in our patients when they make transition from air conditioned hospital environment to the outside warmer or colder climate or when they travel to overseas countries with different temperature range, as well as the already available literature. More studies are needed concerning the effect of travel from temperate climate to tropical countries and vice versa on patients with CHF.

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