

## Traveling Guides for Patients Suffering from Thyroid Disorders; A Narrative Review

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### Abstract

Main thyroid disorders are hypothyroidism, hyperthyroidism, all kinds of swellings and tumors. Generally, thyroid disorders increase the risk of obesity, heart and vessels disease, anxiety, hair dye, sexual disability and infertility clearly. Patients with these diseases have to be aware of appropriate actions for short or long land, air and sea travels in order to prevent side effects of thyroid disorder.

Patients with thyroid disorders are advised to prepare a list of needed medications with help of their physician prior the travel including the dose of the medications and how to bring them, traveling schedule and proper diet planning. Additionally, it is advised to avoid allergens such as fresheners and pathogens such as microorganisms. Taking advantage of destination's treatment insurance during international travels or special tours for specific patients could diminish the probable costs and increase the quality of treatment services.

**Keywords:** Thyroid Disorder, Travel, Patients

**Article History:** Received: 11 Mar. 2015; Accepted: 30 Apr. 2015; Online Published: 26 Nov. 2015

**Cite this article as:** Ghafari F, Pazham H. Traveling guides for patients suffering from thyroid disorders; a narrative review. Int J Travel Med Glob Health. 2015;3(4):149-52.

### Introduction

Thyroid gland is a small organ located in the inferior of the neck, in front of trachea below the larynx (responsible for voice) [1, 2]. This gland is one of the biggest endocrine glands and consists of two lobes [3]. It weighs about 25g and bigger in women and the size increases during menstruation and pregnancy [4]. In the center contains isthmus that connects two big lobes together. Sometimes the 3rd lobe might be revealed from the isthmus or two main lobes like a pyramid. In some cases small masses with same nature of thyroid tissue are observed around the main gland that are not attached to it and are known as accessory thyroid glands [5, 6].

The units of thyroid gland consist of follicles. In their central part, colloidal proteins are stored in order to store thyroid hormone and they have four main responsibilities: iodine absorbing and transportation, making and secreting thyroglobulin, connecting iodine to thyroglobulin in order to build thyroid hormones and secreting thyroid hormones to the blood [7, 8].

Thyroid hormones include tetraiodothyronine or T<sub>4</sub>, triiodothyronine or T<sub>3</sub> and RT<sub>3</sub> (reverse triiodothyronine). It has to be said that calcitonin is synthesized by thyroid gland as well. From the mentioned hormones, T<sub>4</sub> is secreted highly but T<sub>3</sub> has the most action and RT<sub>3</sub> is in the minimum level among them [9]. They regulate the metabolism. The main thyroid disorders include hypothyroidism, hyperthyroidism and all variable kinds of swellings and tumors. Hyperthyroidism occurs because of thyroxin over production and hypothyroidism occurs due to the lack of this hormone production. In general, thyroid disorders enhance the chance of catching obesity, heart and vessels disease, anxiety, hair dye, sexual disability and infertility clearly [10]. Thus assessing the reasons of these disorders is essential for treating infertility. In the opinion of physicians, thyroid disorders are the most common gland disorders especially in women both clearly and potentially. It has been revealed that

about 1 to 2 % of infertility of women is due to gland disorders such as thyroid disorders. Among men, thyroid disorders during maturation ages results in shortness or delayed maturation and during youth ages causes sexual disabilities but generally its prevalence is less in men. So recognizing the signs and symptoms of the disease is crucial and in some cases could be prevented [10, 11].

### Disease that Cause Thyroid Disorder

**Graves-Basedow disease:** It is a kind of immune system disorder of which antibodies target and attack other somatic cells of the same body [12]. This disease is a victim of the thyroid cell immune system. Damaging this gland causes over secreting of the thyroid hormone [13].

Similar to hyperthyroidism, it leads to anxiety in crescent and high and irregular heartbeat.

Symptoms of this disease include eye issues (swelling, inflammation and sting), skin conflicts and goiter swelling [14].

**Hashimoto's hypothyroidism:** An autoimmune disease similar to hypothyroidism and goiter signs in association with hair dyeing. It could make the heart bigger and cause damages to the heart tissue [15, 16].

**Thyroid cancer:** Sometimes unmoral cells or tumor cells are developed in thyroid. Most of them are benign but some are malignant that attack other cells. Thyroid cancer occurs with no sign or symptom. Sometimes strikes to ears, jaw or neck can cause this. Large tumors can damage vocal folds, trachea, esophagus and cause speaking impediments, breathing and swallow disorders. Sometimes cancer reveals symptoms of hypothyroidism or hyperthyroidism but hormone levels are normal [17, 18].

**Thyroiditis:** It is the inflammation of the thyroid gland. Due to thyroid swelling period it could cause both hypothyroidism and hyperthyroidism so symptoms are not constant. Immune system diseases, drugs and infections can progress the thyroiditis trend [16, 19, 20].

As a patient with hypothyroidism, it doesn't mean that you

cannot travel. What only matters is to have a whole image of your travel ahead and to be more cautious about your health. Dominance of some basics could make you relax and enjoy your trip. This means when you return home you would be back to your routine life quickly without a long recovery period.

### Medical Cautionary Measures

Although air travel is one of the safest types of transportation, for certain passengers who have been under medical conditions it could be effective and impact their health. In a pressurized cabin, thanks to the effects of the cabin air pressure (equivalent to being 5,000 to 8,000 feet above sea level), the body's oxygen saturation percentage drops to 6-8 points [21]. The less the cabin pressure gets the less oxygen remains. That could make issues for people who suffer from heart and/or lung disorders. It has to be said that the humidity in the cabin is usually below 20% which this low percentage can make eyes and skin dry and result in dehydration [22, 23].

You would rather consult with your physician before the flight if you have a history of cardiac or pulmonary disease or cancer. If you've had surgery, including eye or dental, within the last month, you may want to be checked by your physician prior to your flight.

As feet may swell during flight, it is strongly suggested to avoid wearing tight shoes. Shoes that you can easily take off are more preferred or consider wearing sandals instead.

Remember to drink fluids before and during the flight to avoid dehydration. Alcohol intake has to be limited at least 24 hours before taking the flight [23, 24].

### Advices that Should Be Observed During the Flight

Alcohol and caffeine can contribute to dehydration so avoid them and drink fluids as much as possible. For example, drinking 250 cc water per hour is suggested. Ask for only bottled water or canned beverages especially if your immune system is suppressed [25].

A recent study by the U.S. Environmental Protection Agency revealed that there could be bacteria in the water on both domestic and international aircrafts [26]. As an unsealed blanket may have germs from previous passengers, an airline provided-blanket or pillow should not be utilized and a sealed package should be taken to advantage [25].

Make sure that you have enough medication during the travel and that means more amount should be carried than usual. This lets you get covered in case of any delay. It's most relieving to have the actual bottles and a copy of your prescription. If you don't plan to bring them, take a note from the pill bottle such as the prescription number, brand name, generic name, pharmacy phone number, etc. with you or you may want to take a photo of them [23, 27].

In air travels, put all of your medications and other medical supplies in your carryon luggage and never leave them in your checked baggage. They are always protected from being lost or extreme situations such as freezing temperature and moisture in the cargo area [28, 29].

If you are traveling abroad or across multiple time zones, consult with your physician previously about the best way to stay on schedule with your medications. This lets you to take a close schedule to your usual home as soon as possible [30].

Aircraft cabins are very dry which can cause dry eyes. Wearing your glasses on flight, or carry lubricating eye drops with you can be of great help. Saline nasal spray may also be brought in order to prevent dryness of your nasal passages

[31]. The dry cabin can aggravate dry skins too. Make sure that you bring along some humidifier cream (in a small, security-friendly travel size). The low moiety and dryness can also cause dehydration, so be sure of drinking adequate amounts of water or fluids during the flight [23, 32].

If you're going to travel by boat or ship, consult with your physician about letting you to have a prescription of scopolamine patches, for sea sickness. Sea or motion sickness can be prevented by Dramamine, Sea Band wristbands, and natural supplements that have ginger [33, 34].

Sitting for long periods can cause stiffness and contraction. To avoid them flux and rotate your neck, back, shoulders, and ankles every 20-30 minutes. This will let blood that may have pooled, to circulate [27].

If you intend to travel to Europe you should apply for a European Health Insurance Card (EHIC) that covers thyroid disorders as well in order to reduce the costs [35].

If you have recently been under radioactive treatment you may trigger radiation detectors at airports and seaports. Even 95 days after the treatment this can happen. If you have to travel in this time you would rather ask for a letter from the hospital where you had the treatment in order to explain the situation [36].

It is most preferred to carry your medicine, including levothyroxine with the original packaging, in hand baggage. If you intend to travel for a long time, try to keep your medicine supplies in two bags in order to access one of them when the others is lost or rubbed. It should be remembered that medication must be kept out of the heat and should be kept in a cool place [23].

### Preventing Hashimoto's Flare-Ups during the Travel

Hashimoto's hypothyroidism managing needs much of time and attention itself. Meanwhile, traveling makes Hashimoto's management to be considered as a new level that you must observe not only your diet, environment, energy expenditure, and sleep, but also the added stressors that appear during the traveling. There are some tips to control your Hashimoto's hypothyroidism better while traveling:

#### Where and what you're Going to Eat must be Planned

Basic management of Hashimoto's hypothyroidism is the special autoimmune diet, which is free of common immune triggers that let you keep your Hashimoto's hypothyroidism under control, but it can be difficult to follow without prior planning.

It's important to determine when you are going to eat safely at your destination. For instance, find the places where your intended kinds of food and other health food stores could be accessible. Make sure there is a refrigerator in your hotel room. Even having a hot plate and a frying pan in order to heat up frying food or making meals with fresh ingredients is recommended [37, 38].

When you can't eat right away, packed snacks such as beef jerky, celery, sardines, olives, coconut meat, etc. seems to be a good idea [39].

Load up on glutathione, the main antioxidant of the body that controls inflammation and Hashimoto's hypothyroidism flare-ups. As exposure to radiation increases through flying at high altitudes, glutathione can also protect the body from it [40].

Traveling could be full of variable stressful elements such as wakening up early, spending long days, experience new

places, crowded airports and etc. These can unload your glutathione store.

#### **Accommodate in a Chemical-Free Hotel Room**

Some hotel rooms spray synthetic-scent once you walk through the door which could be harmful for your health. Feather pillows, dust, and remained air can also trigger immune reactions. Fortunately, there are some hotels that present special services for allergic people such as scent-free allergy-friendly rooms with hypoallergenic bedding, air purifiers, fragrance-free bath products, and windows that open.

Sometimes it is inevitable to avoid exposure from exhaust, perfumes, or the person next to you on the plane sneezing and coughing. So keep a mask with you and wear it during the flight. Don't worry about the way you look with a mask on. It's becoming more common to see people wearing a mask on planes. Remember a good face mask should be comfortable so you can breathe easily while you are protected from undesirable molecules such as toxins and other pathogens in the air. This could prevent a Hashimoto's hypothyroidism flare-up and glutathione depletion.

#### **Hints for Facing the Thyroid Storm**

If you are a patient with hypothyroidism, you better not travel in hot seasons and avoid traveling to very hot regions.

Choose rich protein food for your diet. As Anorexia may occur, you can use complementary proteins.

Drink plenty of fluids and use plant oils such as olive oil in order to prevent constipation caused by hypercalcemia.

If you are dealing with hypercalcemia crisis you would rather drink plenty of fluids, take diuretics especially Lasix, calcitonin, phosphor, pamidronate and dialysis as your physician prescribes [43-45].

#### **Hints for Patients with Thyroid Cancer**

Long distance flights might cause blood clots. In patients who are suffering from thyroid cancer and those who are under treatment with chemotherapy or hormonal therapy this risk may increase. Wear comfortable clothes, walk around the cabin periodically, and do light exercises in order to have blood circulation in your legs. If you suffer from anemia, ask your physician whether you will need additional oxygen. It is most recommended to all at risk patients to wear anti-embolic stockings and taking aspirin [46]. Sometimes, for patients considered at a greater risk, taking low molecular weight heparin is recommended.

Chemotherapy can cause lymphoedema. During travels, especially long distance ones as of inactivity for long periods, the condition may go worse for lymphoedema patients. An assessment by a specialist would be beneficial prior to flight. Avoid wearing restrictive clothing and use dense ones [47].

If lymphoedema affects the lower limbs you should wear suitable and special shoes in order to prevent difficulties in case of swelling and keep your shoes on during the flight. You should also use special shoes when bathing in the sea and do not forget to keep them on [48]. If lymphoedema affects the upper limbs avoid wearing rings or wristwatches and also avoid carrying heavy luggage [47, 48].

Vaccination against certain diseases before travelling to certain countries should be done. If the patient cannot take a certain vaccine of destination, he/she should reconsider traveling and change the destination. Avoid injecting the vaccinations into the affected limb. Special care accompanied with antibiotics must be carried in case of

sunburn and insect bites [27, 49].

Wash your hands regularly, use antiseptic gels, do not use ice and eat completely cooked foods in order to prevent infection disease indication.

Take disease symptoms seriously. Be flexible because fatigue is inseparable with cancer and its treatment trend. So do not put much of pressure on yourself.

Your skin's sensitivity to the sun can be increased by chemotherapy, certain antibiotics, and radiation treatment. When you are outdoors use sunscreen and always wear protective hats and clothing [50].

In order to save energy and prevent weakness and nausea take along a stash of crackers, energy bars, or other high colliery food [51].

#### **Travel to Some Countries**

There are some countries that due to their special features may cause situations that can put the thyroid patients in danger. For instance, as heat tolerance is greatly diminished in cases of both hypothyroid and hyperthyroid conditions a trip to tropical countries is only possible if the thyroid function is well-adjusted. This means your body is not capable to maintain normal temperature in both cases. In cases of hypothyroid this is because of a decreased ability to perspire, while hyperthyroid patients may face the danger of heart strain, increase in basal metabolism and a tendency towards diarrhea. Most countries in central Europe, such as Germany, Austria and Switzerland are low-iodine areas. A hyperthyroid condition caused by lack of iodine in Germany may derail under certain circumstances (autonomous adenoma). If you are staying for a longtime, the thyroid readings should be checked regularly. You might want to mail your serum sample (in a brown monovette tube available from pharmacies). For this purpose, previously this should be arranged between your physician and the institution making the examination [29, 52, 53].

#### **Conclusion**

Probable issues that a thyroid patient might encounter during a travel are: carrying and storing the medications, multiple time zones and different kinds of meals, environmental and nervous stresses, oxygen and pressure dropping as of high altitude and air pressure decrease, facing allergens and pathogens and indication of autoimmune disease, eye and skin dryness, glutathione depletion and indication of sea and motion sickness. Despite that all the above hints are useful for all thyroid patients, every patient has unique circumstances that should be consulted with a specialist. Therefore the most important action prior to making any kind of decision would be to consult with your physician about the destination, diet, actions that you must do and prepare a list of all kinds and doses of your medications and equipment that you might need. Make sure you have gathered enough information about the weather conditions, diet and your destination insurance service in order to prevent stress and facing difficulties. Choose hotels, tours and restaurants that offer specific services for special patients. Postpone your travel in case of any kind of infectious disease indication before the travel as long as possible. The disease is not an obstacle for travelling. It just needs more observation in order to enjoy the trip. Regarding the above hints let yourself enjoy a safe and sound trip like other family members.

## Acknowledgments

We would like to thank the “Clinical Research Development Center” of Baqiyatallah hospital for their kind cooperation.

## Authors' Contributions

All author have equal contribution in this study.

## Financial Disclosure

This study has no financial disclosure.

## Funding/Support

This study was supported by the Baqiyatallah University of Medical Sciences.

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