Ear Infections and Diving: a difficult relationship!

It’s winter; and still a handful of European divers continue diving regardless of the cold temperatures that have enveloped Europe. You get out of the water, and climb into the dinghy, taking off your drysuit’s hood to alleviate some of the pressure on your neck, and so you can speak freely with friends…You sit on the dinghy that goes straight toward the port. What could all this mean for our ears? Cold water entering in the ear canal, followed by exposure to cold air and wind, even rain. Here is where the trouble begins; maybe not after the first dive, but after the repetitive one, or on Sunday if you were out for the weekend. Other divers find refuge in warm, tropical destinations, but for our ears, that isn’t really any better. Water that’s rich in plankton and algae, the sweet sensation of wind in your hair… and in your ears! Even in this case, after a few days of diving some equalization problems arise, first with the onset of a painful sensation that gets increasingly intense, accompanied by muffled hearing, pressure pain, possible itching and a constant buzzing (tinnitus). Weeks of vacation lost? By no means, if you know how to treat this annoying problem, or above all, how to prevent it. We have asked Dr. Marta Frigo, ENT specialist and DAN Europe contact for this branch of medicine.

Dr. Frigo, what is the cause of this problem that often plagues divers?

We’re talking about an external otitis, otherwise known as an infection of the outer ear, which is composed of the auricle and ear canal. The latter is the only "dead-end structure" in the human body: a small sack covered in skin, which is warm, humid and dark resulting in the perfect condition for the proliferation of germs. An outer ear infection constitutes 25-50% of ear infections, and peaks in Summer. The categories at risk are individuals with predisposed medical conditions, and those who do water sports. 90% of outer ear infections are bacterial (staphylococcus or Pseudomonas aeruginosa), while the other 10% are fungal infections (candida or aspergillus), and even more rarely, viral.

How does the human body defend itself from this bacteria, fungus, or virus?

Fortunately, the outer ear canal has special defenses: the production of earwax allows for an acid coating containing lysozyme and substances that inhibit growth of bacteria and fungus. Earwax, being rich in lipids, is also hydrophobic (water repellant) and prevents water from penetrating the skin and causing maceration.

Are divers affected by this problem more than the average person?

After prolonged exposure to potentially affected water, or water that is rich in plankton, divers are five times more at risk of developing an external ear infection than those who do not dive or swim. Between snorkelers and divers the risk doesn’t change because the problem is not connection to hyperbarism, but to contact with water, especially at the surface.

What factors may favor the onset of external otitis?

There are external factors and personal factors. External factors are: hydration (frequent exposure to water, excessive sweating, high humidity); water contaminated by bacteria; high temperature and humidity; mechanical/traumatic removal of ear wax (e.g. using cotton buds); presence of foreign bodies in the external auditory canal.

The systemic-localized factors are: dermatitis from an allergic reaction or irritants; psoriasis, seborrheic dermatitis, acne, lupus erythematosus, diabetes mellitus, and immunodeficiency.



How is it cured?

In the case of a simple bacterial outer ear infection, without complications like fever or infection of surrounding tissues, a localized treatment with antibiotics and steroids in sufficient. The most effective antibiotics are fluoroquinolone (ciprofloxacin, ofloxacin...).

In the case of fungal otitis, it is necessary to use anti-fungal drops, and to rinse out the ear with acidifying solution. If the infection has spread to surrounding tissues, it's useful to proceed with oral fluoroquinolone and anti-fungals.

What are the recommended ways of prevention?

Prevention is the best way to approach the problem because developing an external ear infection during a dive vacation or cruise means forgoing dives!

Prevention is fundamental for those who have the aforementioned risk factors. First, you must practice proper hygiene of the ear canal, removing any wax buildup or foreign matter. Necessary to note, however, that obsessively cleaning the ear canal is not beneficial; rather, it can be counterproductive because constantly rubbing the thin skin of the outer ear canal can cause microabrasions that are an "open door" for bacteria. Also, earwax isn't dirt that comes from the outside, as many think, but a product of wax glands in the outer ear canal that protect the ear from such feared infections. Only if there is a buildup of wax is it necessary to go to an ENT doctor for a cleaning.

Since localized factors like dermatitis and psoriasis cause intense flaking of the skin, accompanied by dry skin deprived of wax, prevention will mean applying otological oils to build the missing lipid film. Drops can

be applied in the morning before or after dives or before swimming.

After exposure to sea water or to pool water, it is a good idea to wash the ear canals with running water, then gently dry them (with toilet paper or a hairdryer on low setting), to eliminate the residue of salt water or chlorine. Never dry with cotton q-tips or similar products. It would then be helpful to use drops that acidify and dry out the external ear canal (boric alcohol 3%, acetic acid 5% and isopropyl acid 85%.

What do you think about using ventilated ear plugs and a mask that has ear covers?

For those predisposed to external ear infections who dive frequently, like professional guides or instructors, in addition to localized preventative therapy, it's recommended to use a mask with ear covers (like Proear) because completely covering the auricle and the outer ear canal prevents contact with water, without any obstacle to equalizing thanks to a tube connecting the nose to ear.

Beyond a certain depth, vent caps still allow a gradual passage of water. As a result, although reduced, there is water–skin contact.
For any activity that is just on the surface, like snorkeling, it's fine to have earplugs or a tight hood.

As all divers know, the ears greatly influence diving, both in terms of equalization and infection, to the point of impeding a diver from going underwater. So, just by taking proper prevention procedures... your ears will let you enjoy that weekend or vacation!

Before leaving for your next dive adventure, make sure your DAN membership is still active. If it isn't, join DAN or renew your membership at www.daneurope.org

Your DAN membership ensures the services of the biggest international network, assisting divers anywhere in case of emergency.