Editorial

Ocular problems associated air traveling

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Air traveling has been increased day by day. Thus, both aircraft crew and passengers have been affected by air travel conditions such as severe turbulence, low pressure or humidity, the presence of ozone and dry air in the cabin. Because of the change in cabin air pressure and its possible ocular hazards, the delay of the airplane traveling in the individuals undergone vitreoretinal or cataract surgery has been recommended until cleared by the ophthalmologist. However, the patients with glaucoma can safely travel by airplane as long as they take their antiglaucomatous medications.[1–6] The most experiencing ocular complaints in air travelers are dryness in ocular surface (20%) and related symptoms. Additionally, other ocular problems including itching in the eyes, severe orbital pain or headache, watering in the eyes and contact lens intolerance may be experienced.[1,3,5–7] Neuro-ocular vestibular dysfunction (NOVD), ischemic optic neuropathy, aggravation ofdiabetic cystoid macular edema have been also reported regarding with the ocular disorders to be occurred during air travelling.[8-11]

Moreover, it has been speculated that central retinal artery occlusion or other ocular ischemic events may occur due to reactive vasoconstriction or ischaemic changes during the traveling at high altitude.[12] However, orbital or ocular pain experienced in a rate of 1-2% in air travelers is the most worrying and excruciating symptom. Ocular pain which occurred in air travelling has been classifiedas a type of a headache by International Headache Society (IHS) since 2013.[13] Diagnostic criteria of a headache attributed to airplane travel ("airplane headache") (AHA) include fulfilling criteria at least 2 attacks, including ''1. severe pain during airplane travel lasting less than 30 min, with at least 2 of these ''unilateral pain, fronto-orbital location (frontoparietal pain may occur), pain of jabbing or stabbing quality (pulsating may occur)''; ''2. no accompanying symptoms''; ''3. not attributed to other disorders''.[13] AHA appears in especially during the landing or descent phase, sometimes ascending or take-off phase in airplane flights. Another predominant typical feature of AHA is that it is not experienced without any accompanying concomitant disturbanceor symptom in approximately all cases.

The stereotypical typical clinical characteristic of an AHA attack is an intense and very severe unilateral pain localized to the fronto-orbital region or periorbital region. It suddenly and shortly starts after the rapid descent from an average altitude of 1,800 m. The peak intensity of pain is experienced in a few minutes and AHA usually lasts 20-30 minutes corresponding to the duration of take-off and landing of aircraft until complete resolution. Most previous studies report a male predominance for AHA. AHA usually manifests between 25-30 years. The pathogenesis of this headache type has diversity including mainly sinus barotrauma or possibly vasodilation in the cerebral arteries as a result of cabin pressure change in air traveling. It has been considered that barotrauma associated with trigeminal nerve endings in the ethmoid sinuses causes the fronto-orbital pain in this clinical entity.[14–16] It has been speculated that the vasodilation in the cerebral arteries which developed during an AHA-attack may be induced by prostaglandin E2.[14,17] Although there is no specific treatment or prophylaxis for AHA, it has been demonstrated that several medications including analgesics, nonsteroidal anti-inflammatory drugs or triptans may have beneficial effects as prophylactic therapy. However, drugs and nasal spray decongestants should be taken prophylactically approximately 30 minutes and 30-60 minutes, respectively before the expected triggering phase (ascending or descending phase) of the flightto obtain optimal results**.** Some maneuvers including compression on pain region, Valsalva maneuver, extension of the earlobe, chewing, or yawning can provide a relief of %25 in pain intensity.[14–17]

Dry-eye is the most common problem in the air travelers. As air humidity in the cabin of the aircraft is often lower than 20% of humidity rate and the air in the pressurized cabin is dehydrated, dryness in both skin and ocular surfaces usually occur. In case of low humidity, especially, the users of contact lens is at the risk of dryness because of the elimination of the main source of oxygen under the lens. Using a skin moisturizing lotions and lubricating solutions or artificial tears, and wearing spectacles instead of contact lenses, drinking extra water, turning off the blowing direction of the air conditioner to another side rather face and giving a break while reading during flight may relieve or prevent discomfort.[1,3,5,6] Neuro-ocular vestibular dysfunction or motion sickness can be experienced by air travelers in the case of severe turbulence. In an airplane traveling, the obtaining the seat at just near the window and the mid-section of the cabin or chairs fitting on the wing where movements are the least felt may be beneficial to prevent suffering motion sickness for the individuals who know their have NOVD.

Additionally, some medications that can be taken before the flight will help in preventing of this disease, may be beneficial.[18–21] Air turbulence during flight can also cause ocular trauma, especially in the eyes having recently ocular surgery such as vitreoretinal surgery in which expandable intraocular gases were used and cataract surgery with intraocular lens implantation. Because air turbulence may cause wound openingin the corneal incision region due to retching and vomiting or severe elevation of intraocular pressure due to the expansion intravitreal gas and consequently central retinal artery occlusion. Thus, these passengers should not travel immediately after cataract surgery and should be kept the seat belt fastened as long as the passenger seated. The delaying the travel for approximately two and six weeks following intraocular injections of sulfur hexafluoride (SF_6) and perfluoropropane (C_3F_8), respectively has been recommended.[22] Air travelers with glaucoma usually do not experience any problem. A rapid decrease in the atmospheric pressure during flight can cause to a relative increase in intraocular pressure. However, this change usually does not cause a problem in a glaucoma patient during air travelling because aircraft cabins have a controlled artificial atmospheric pressure and this often compensates this decrease in pressure developed at high altitude.[22,23]

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References

1. Eng WG. Survey on eye comfort in aircraft, I: flight attendants. *Aviat Space Environ Med.* 1979;50(4):401–404.
2. Committee on Airliner Cabin Air Quality, Commission on Life Sciences, Division on Earth and Life Studies, National Research Council.The Airliner Cabin Environment: Air Quality and Safety. National Academies Press, Washington DC,1986, p.190–207.
3. Leggat PA, Speare R, Moon ME. Sore eyes and travelers. *J Travel Med.* 1999;6(1):45–47.
4. World Health Organization. Mode of travel: health considerations.
5. Norbäck D, Lindgren T, Wieslander G. Changes in ocular and nasal signs and symptoms among air crew in relation to air humidification on intercontinental flights. *Scand J Work Environ Health.* 2006;32(2):138–144.
6. Backman H, Haghighat F. Air quality and ocular discomfort aboard commercial aircraft.*Optometry.* 2000;71(10):653–656.
7. Bekö G, Allen JG, Weschler CJ, et al. Impact of cabin ozone concentrations on passenger reported symptoms in commercial aircraft. *PLoS One.* 2015;10(5):e0128454.
8. Zhang LL, Wang JQ, Qi RR, et al. Motion sickness: current knowledge and recent advance. *CNS Neurosci Ther.* 2016;22(1):15–24.
9. Kaiserman I, Frucht-Pery J. Anterior ischemic optic neuropathy after a trans-Atlantic airplane journey. *Am J Ophthalmol.* 2002;133(4):581–583.
10. Panos GD, Panos LD, Hafezi F, et al. Ischemic optic neuropathy after a long airplane flight: coincidence or rare economy class syndrome manifestation? *Klin Monbl Augenheilkd.* 2014;231(4):390–391.
11. Daniele S, Daniele C. Aggravation of laser-treated diabetic cystoid macular edema after prolonged flight: a case report. *Aviat Space Environ Med.* 1995;66(5):440–442.
12. Newsom RS, Trew DR, Leonard TJ. Bilateral buried optic nerve drusen presenting with central retinal artery occlusion at high altitude. *Eye (Lond).* 1995;9(Pt 6):806–808.
13. Headache Classification Committee of the International Headache Society (IHS). The international classification of headache disorders, 3rd edition (beta version). *Cephalalgia.* 2013;33(9):629–808.
14. Bui SBD, Gazerani P. Headache attributed to airplane travel: diagnosis, pathophysiology, and treatment–a systematic review. *J Headache Pain.* 2017;18(1):84.
15. Mainardi F, Lisotto C, Maggioni F, et al. Headache attributed to airplane travel ('airplane headache'): clinical profile based on a large case series. *Cephalalgia.* 2012;32(8):592–599.
16. Berilgen MS, Müngen B. A new type of headache, headache associated with airplane travel: preliminary diagnostic criteria and possible mechanisms of aetiopathogenesis. *Cephalalgia.* 2011;31(12):1266–1273.
17. Benedetti F, Durando J, Giudetti L, et al. High-altitude headache: the effects of real vs sham oxygen administration. *Pain.* 2015;156(11):2326–2336.
18. Zanchin G, Maggioni F, Granella F, et al. Self-administered painrelieving manoeuvres in primary headaches. *Cephalalgia.* 2001;21(7):718–726.
19. Murdin L, Golding J, Bronstein A. Managing motion sickness. *BMJ.* 2011;343:d7430.
20. Shupak A, Gordon CR. Motion sickness: advances in pathogenesis, prediction, prevention, and treatment. *Aviat Space Environ Med.* 2006;77(12):1213–1223.
21. Brainard A, Gresham C. Prevention and treatment of motion sickness. *Am Fam Physician.* 2014;90(1):41–46.
22. Houston S, Graf J, Sharkey J. Commercial air travel after intraocular gas injection.*Aviat Space Environ Med.* 2012;83(8):809–810.
23. Bagshaw M, DeVoll JR, Jennings RT, et al. Medical guidelines for airline passengers.