

Restart of Study on Brain Damage in Flight Personnel

About Coincidence, Obstacles, Patience, and Perseverance

Daniel Dumalin | May 12, 2024

The Beginning

In 2018, I marked an appointment in my agenda for a former Belgian Stewardess referred by a trauma specialist to objectify brain damage suspected to be an occupational disease.

After processing the results, I saw a picture where it wasn't clear how this could be related to the work environment aboard an aircraft. Based on past experiences, I anticipated that the answer might lie in an unexpected corner. And indeed, that turned out to be the case here.

I began searching for more information to obtain a picture as comprehensive an understanding as possible of the unique working environment aboard an aircraft. I examined the technical specifications of the aircraft as well as the work schedules. During this search, I quickly learned about a known issue with aircraft air quality, called "Aerotoxic Syndrome."

With this discovery, I found my first point of reference from which to evaluate the results of this Stewardess. It involves overstimulation of nerves due to an excess of the neurotransmitter Acetylcholine, which is not adequately broken down. By delving into the scientific literature, a connection became clear between the identified functional impairments in the qEEG and the toxic substances present in cabin air.

As traumatic brain injury is unique to each individual due to various primary factors and secondary consequences, the question needed to be answered if this could also be the case here. To answer this question, I needed to find some willing volunteers to undergo the same tests.

Through an international detour, I got in touch with a Stewardess in Belgium who was willing to spread my call among her colleagues. After processing the tests of two additional flight attendants, I found that all three had comparable results; a remarkable finding. This could indeed potentially be an occupational disease.

I had achieved my goal. The necessary questions to proceed further had been answered. Without any further thought, I finalized my report.

However, I hadn't anticipated that news of my initial results would become public. A month later, in January 2019, I was contacted by [Stichting Fly Aware](#) from the Netherlands to meet and exchange ideas.

The Initial Results

Subsequently, I had the opportunity to examine four additional volunteers. Upon comparing the results of a total of seven studies, I found that the results remained remarkable; all seven candidates had similar outcomes.

Such results set many things in motion.

In February 2019, I was contacted by a journalist from Belgian newspaper *Het Laatste Nieuws* who had already written several articles about the 'toxic air' in airplanes in Belgium. An initial conversation led to an interview published on April 8, 2019, in [Het Laatste Nieuws](#). The preliminary results of this pilot study were then presented at the Aircraft Cabin Air Conference 2019 held on September 17-18, 2019, in London. As a result, news of my study spread rapidly worldwide, and an extensive study could commence.

Many aviation personnel contacted me to be examined. This made 2019 a very busy period. Thanks to the assistance of Stichting Fly Aware, it was possible to streamline everything so that I could primarily focus on my research.

Unexpected Obstacles

As the end of the year approached, the unexpected occurred, forcing me to hit the pause button. At least, that's how it seemed then. Despite the interest in my research from the hospital management, I had to first submit an official request to continue.

Preparation of the application was underway when a pandemic was declared, leading to strict measures in the hospital and international travel restrictions. The management now had other concerns, putting the application on hold. Since no one knew how long this would last, there was still a silent hope that everything would eventually return to normal. However, this dragged on much longer than expected, making it seem like a halt to my study.

When the hospital had just returned to normal working conditions, a new obstacle was thrown in the way. Due to a political decision, it was announced that a unilateral agreement had been signed to separate from our then-fusion hospital and merge with another hospital. This is a hospital with a completely different hospital culture where scientific interest is lacking.

It now seemed that this meant the final blow to my research. But there were still many other changes at the expense of things dear to me. This, together, forced me to say goodbye and switch to a private practice.

A New Beginning

After all these incidents, it is now more than 4 years later, and it is only now possible to restart my research on aviation personnel. However, a 4-year pause does not mean that nothing has happened with the studies from 2019.

Firstly, this gave me time to further process all studies and determine if all participants had similar results to the initial volunteers. This was not the case. Four different patterns were identified, the majority of which showed a similar pattern to the first candidates. These results were presented at the online Aircraft Cabin Air Conference 2021.

Secondly, I was able to delve into the scientific literature to understand how exposure to cholinesterase-inhibiting substances present in cabin air could lead to these four different patterns. This ultimately provided enough information to link all results to brain damage resulting from Acetylcholine overstimulation.

The Future

This also made it clear that further research is needed. From a scientific standpoint, among others, because two groups contain only a small number of individuals. But also to support aviation personnel in obtaining recognition for injuries resulting from harmful substances present in the work environment.

In addition to continuing with processed data, I have recently started processing additional data. Besides recording brain signals, heart rate is also measured. Although still in the early stages, it already shows that, just like with the qEEG, there are different profiles. Additionally, it is known that heart rate variability (HRV) is related to resilience. This suggests that qEEG and HRV profiles together can provide a (good) assessment of resilience.