This descriptive study reports the results of assays performed to detect circulating autoantibodies to a panel of seven proteins associated with the nervous system in sera of 12 healthy controls and a group of 34 flight crew members (including pilots and attendants) who experienced adverse effects after exposure to air emissions in the aircrafts. The proteins used were chosen to represent the various types of proteins present in nerve cells and affected by neuronal degeneration. In sera samples from flight crew members and healthy controls, using Western blotting, immunoglobulin IgG were measured against: neurofilament triplet proteins (NFP), tubulin, microtubule associated tau proteins (tau), microtubule associated protein-2 (MAP-2), myelin basic protein (MBP), glial fibrillary acidic protein (GFAP), and glial S100B protein. The results show statistically elevated levels of circulating Ig-G-class autoantibodies in the flight crew members, compared to controls. Also reported are statistical elevations in autoantibodies to most of the tested proteins in serum from a pilot after exposure, compared to a serum sample obtained prior exposure. Furthermore, after cessation of flying for a year, the pilot’s clinical condition improved and his serum's autoantibodies against nervous system proteins decreased. This case study demonstrates a temporal relationship between exposure to air emissions, clinical condition, and the level of serum autoantibodies to nervous system-specific proteins. These results suggest the development of neuronal injury and gliosis in flight crew members anecdotally exposed to cabin air emissions containing organophosphates and that these circulating serum autoantibodies may be used as biomarkers for chemical-induced nervous system injury.

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