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Experienced pilots may be at risk of DNA damage from ionizing radiation

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Airline pilots who have flown for many years may be at risk of DNA damage from prolonged exposure to cosmic ionising radiation, suggests a study published ahead of print in *Occupational and Environmental Medicine*.

The research team compared the rate of chromosomal (DNA) abnormalities in blood samples taken from 83 airline pilots and 50 university faculty members from the same US city.

The two groups were matched for age (35 to 56), sex (male), and smoking habit (light or non-smokers). Age and smoking are known risk factors for cumulative DNA damage.

Fifty eight of the pilots (70%) had served in the military, and they had undertaken significantly more personal air travel than the university staff. Both these factors would have exposed them to more ionising radiation.

The researchers were looking in particular for the number of times pairs of chromosomes had changed places (translocations), expressed as a score per 100 cell equivalents (CE).

Chromosome translocations are a reliable indicator of cumulative DNA damage associated with radiation exposure as they are not rapidly eliminated from the blood like other forms of chromosomal abnormality.

The average frequency of chromosome translocation was higher among the pilots than the faculty staff (0.39 compared with 0.32/100 CE), but after adjusting for age and other influential factors, there was no difference.

But when the analysis focused on how long pilots had been flying, differences emerged.

The chromosome translocation frequency of those who had flown the most was more than twice that of those who had flown the least, after taking age into account.

Adjusting for the impact of cigarette smoking, personal air travel, and diagnostic x-ray procedures did not affect these findings.

Chromosomal abnormalities have been associated with an increased risk of cancer. And the authors conclude that their results suggest that highly experienced flight pilots may be exposed to "biologically significant doses of ionising radiation."

Source: British Medical Journal