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The presence of aflatoxin B1-FAPY adduct and human papilloma virus in cervical smears from cancer patients in Mexico

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Many natural foods (cereals, spices, oilseeds, etc.) are contaminated by the fungi *Aspergillus* spp. that produce the carcinogens called aflatoxins, they are inevitable risks for all humans who are consuming them daily, also in processed foods. These AF are activated in the human liver where the carcinogenic biomarker aflatoxin B_1-formamidopyrimidine 2,3-dihydro-2-(N-formyl)-20, 50, 60-triamino-40-40-oxy-N-pyrimidyl-3-hydroxy-AFB_1 called AFB_1-FAPY adduct is formed, and it is stored in the DNA for years. In the present research this AFB_1-FAPY adduct was quantified as well as Human Papilloma Virus (HPV) types 16 and 18 identified from DNA cervical scrapes from 40 women with cervical cancer (CC) and 14 healthy women as controls. The relationship between the AFB_1-FAPY adduct and HPV types 16 and 18 was determined. Competitive inhibitory indirect ELISA was validated with 94% inhibition to quantify the AFB_1-FAPY adducts in picograms per milligram of DNA (limit of detection= 0.1 pg/mg, and limit of quantification= 10 pg/mg), polymerase chain reaction and DNA sequencing to identify HPV types. The average concentration of AFB1-FAPY adducts/mg DNA in the CC cases was 1025 pg, 1420 pg with HPV16 and 630 pg sharing HPV18 ($p= 0.03$). In comparison, healthy controls had 2.6 pg/mg DNA, a statistically significant difference ($p\leq 0.00006$). The presence of AFB1-FAPY adduct increased six-fold the risk for CC between cases and controls, the odds ratio was 6.1 (95% CI= 1.4–25.4). There was a close relationship between the AFB1-FAPY adducts and HPV16 in CC samples. The conclusion is that cervical cancer is originated by both carcinogens AFB_1-FAPY adduct and HPV.

Biography

Magda Carvajal is plant pathologist from the 'Colegio de Posgraduados' in Mexico and completed his PhD in 1986 in the National Autonomous University of Mexico and postdoctoral studies from Bristol University, UK and Cancer Unit, University of York, UK. She has been president of the Mexican Society of Mycology and of the Latin American Society of Mycotoxicology. She has 148 publication as articles in reputed indexed journals, book chapters and in congress proceedings. She won the National Food Science and Technology Prize in 2012 and has been serving as an editorial board member.

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