A case study was carried out to explore the occurrence of a cancer cluster in 1992 among young Indian adults living in an Amazonian village near two 500 kV power transmission lines that began operating a decade ago. Current blood levels of DDT and organophosphorus pesticides and metal levels in hair samples were measured. Extremely low magnetic field exposure was determined during current daily activities carried out by the Indian villagers. Taking into account the cancer incidence rates in different Brazilian cities, the probability of the occurrence of this cluster by chance was considered remote ($p < 0.003$, Poisson distribution). High blood levels of $p,p'$-DDT (median levels ranging from 26 to 58 ppb) were observed. As a whole, this community showed a pattern of low exposure to organophosphorus pesticides, and high recent exposure was only observed in a few blood samples. Continuous exposure to extremely low electromagnetic fields originated in the power transmission lines (which reached 95.0 mG under the lines) was observed on several opportunities during daily activities carried out by Indian villagers. Further observational studies should evaluate the interaction between exposure to extremely low electromagnetic fields and prior exposure to tumor initiators in cancer development.