



K31 Determination of Organochlorine Pesticides Residues in Human Subcutaneous Adipose Tissue

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The goal of this presentation is to demonstrate OCP residues in human adipose tissue as a result of chronic exposure in non-agricultural people.

This presentation will impact the forensic science community by describing how chronic exposures to OCP'S may cause serious damages to an individual, in means of cancer mechanisms, as also may explain the mechanism, cause of deaths. Environmental policies will soon be a forensic discussion and insurance problem.

Cukurova region is one of the most important agricultural areas of Turkey and approximately 32% of agrochemicals is consumed in this region. Negligence of performing required safety measures and lack of appropriate equipment for the preparation, and use of pesticides frequently cause accidental, acute, or ignored chronic exposure of pesticides in Turkey. Thus, in our region, biological monitoring of the pesticides, environmentally more persistent ones in particular, has a great importance. This study was aimed to monitor the chronic exposure of organochlorine pesticide (OCs) which are highly persistent in environment, and are tend to accumulate in human tissues due to their lipophilicity and resistance to metabolism.

Gas chromatography with electron capture detector (GC-ECD) was used to identify and quantify residue levels on a lipid basis of OCs. The minimum detection limits on fat basis for the studied organochlorine pesticides were as follows: 0.48 ng/g for α -BHC, β -BHC, and δ -BHC, 0.24 ng/g for HCB, *p,p*-DDE and 0.97 ng/g for *o,p*-DDE, *o,p*-DDT, and *p,p*'-DDT. Recovery studies were performed on fortified blank animal fat samples at 50 and 100 ng/g concentrations. Ten samples were examined for each concentration. Depending on the pesticide, repeated analyses showed mean values from 74 to 107% of recovery. The concentrated sulfuric acid used in the clean- up step of adipose tissue extracts in order to degrade the phthalate esters that interfere in the gas chromatographic identification of organochlorine pesticides.

The average results (\pm S.D) for females and males were as follows; For females: HCB 5.47 ± 6.21 , α -BHC 11.27 ± 9.89 , β -BHC 3.99 ± 5.36 , Σ -BHC 12.13 ± 10.19 , *p,p*'-DDE 106.68 ± 90.31 , *o,p*'-DDT 1.09 ± 0.0 , *p,p*'- DDT 8.49 ± 10.54 , Σ -DDT 113.43 ± 94.99 ppb. For males: HCB 5.32 ± 5.57 , α -BHC 6.96 ± 5.86 , β -BHC 1.22 ± 0.94 , Σ -BHC 4.65 ± 5.67 , *o,p*'- DDT 1.41 ± 0.59 , *p,p*'-DDE 41.07 ± 38.45 , *o,p*'-DDT 2.34 ± 0.15 , *p,p*'- DDT 3.31 ± 3.33 , Σ -DDT 44.02 ± 40.33 ppb.

We determined dichlorodiphenyltrichloroethane, and its metabolites (DDTs), hexachlorobenzene (HCB), Benzenehexachloride (BHC) residues in human subcutaneous adipose tissues of 82 autopsy cases from the Morgue Department of Adana Branch of the Council of Forensic Medicine. Of all cases, 14 were female, and 68 were male and the average age was 40.51. The relationships between the age, gender, and body mass indexes of cases, and the accumulation of OCs residues were also investigated. Detectable concentrations of *p,p*'-DDE were found in 100% of adipose tissue samples. Among the remaining *p,p*'- DDT (84.1%), HCB (62.2%) were followed by α -BHC, β -BHC, *o,p*'- DDT, *o,p*'-DDE.

Concentrations of OCs in female adipose tissues were significantly higher than male adipose tissues ($p < 0.05$). Positive correlations were found between concentrations of OCs in human adipose tissues and age of cases. The obtained results were compared to the results of studies conducted in countries where pesticide use is prohibited or allowed and with similar studies performed in our country.

The present study revealed that although the use OCs is forbidden biologic monitoring still shows residues in human tissues, in Turkey. This work is highly significant, being the first study pointing out the chronic exposure to organochlorine pesticides in our region.

Organochlorine Pesticide, Subcutaneous Adipose Tissue, Gas Chromatography