

Alteration in the immunotoxicity of LOEL dose of dimethoate on combined exposure with NOEL doses of cypermethrin and amitraz in rats in a subacute experimental system.

L. INSTITÓRIS¹, I.K. KECSKEMÉTI¹, DÓRA KOVÁCS¹, ANITA LUKÁCS²,
ANDREA SZABÓ², ZSUZSANNA LENGYEL² and A. PAPP²

¹ Dept. Forensic Medicine, Szeged, Hungary

² Dept. Public Health, Fac. Medicine, Univ. Szeged, Szeged, Hungary

AIMS: Investigation of the toxicity of pesticide mixtures is essential for the risk assessment of combined exposure situations. The aim of the present work was to study the effects of NOEL (No Observed Effect Level) doses of cypermethrin (CY, NOEL=11.1 mg/kg) and amitraz (AM, NOEL=10.6 mg/kg) on the immunotoxic effects of LOEL (Lowest Observed Effect Level) dose of dimethoate (DM, LOEL=28.2 mg/kg).

METHODS: 4 weeks old male Wistar rats (24 animals per dose group) received the following combinations: DM_{LOEL}+CY_{NOEL}+AM1 pt; DM_{LOEL}+CY_{NOEL}; DM_{LOEL}+AM_{NOEL}; CY_{NOEL}+AM_{NOEL}; DM_{LOEL} (internal control); and vehicle only, for 28 days. The animals were divided into 3 groups: 8 rats were used to determine certain classic toxicological (body weight gain, organ weights of thymus, lung, heart, liver, kidneys, adrenals, testicles, and popliteal lymph node), and hematological (WBC, RBC, MCV, Ht, Hb, cell content of the femoral bone marrow) parameters, 8 for PFC assay, and 8 for Delayed Type Hypersensitivity (DTH) reaction. The IgM-PFC content of the spleen was determined by the Cunningham method, the DTH reaction was measured by footpad swelling assay.

RESULTS: Except for the CY_{NOEL}+AM_{NOEL} combination, where RBC and MCV decreased significantly vs. vehicle control, interactions were detected only in the changes of organ weights and in the PFC assay. The DM_{LOEL}+CY_{NOEL}+AM_{NOEL} combination increased the relative liver weight and decreased the PFC content of the spleen, the DM_{LOEL}+AM_{NOEL} combination increased the relative weight of testicles and the PFC response. The DM_{LOEL} dose has changed the structure of PFC response (decreased PFC/10⁶ cells and increased spleen cell number) without altering the PFC content of the spleen, and diminished the relative spleen weight. The latter effect was antagonized by the DM_{LOEL}+CY_{NOEL} and DM_{LOEL}+AM_{NOEL} combinations.

KEYWORDS: *Combined exposure, Dimethoate, Cypermethrin, Amitraz, Rats, Subacute Exposure, Repeated low dose*

Corresponding author: ist@puhe.szote.u-szeged.hu