

INFLUENCE OF THE MIXTURE OF CD AND BDE-209 ON ZN AND CU HOMEOSTASIS IN RATS

Marijana Ćurčić^{1*}, Saša Janković², Aleksandra Buha Đorđević¹, Vesna Milovanović³, Evica Antonijević Miljaković¹, Danijela Đukić-Ćosić¹, Dragana Javorac¹, Katarina Baralić¹, Katarina Živančević¹, Dragica Božić¹, Ksenija Durgo⁴, Slavica Vučinić⁵, Zorica Bulat¹, Biljana Antonijević¹

¹University of Belgrade – Faculty of Pharmacy, Department of Toxicology "Akademik Danilo Soldatovic", Belgrade, Serbia

²Institute of Meat Hygiene and Technology, Belgrade, Serbia

³GlaxoSmithKline, Toxicovigilance, Brussels, Belgium

⁴ University of Zagreb – Faculty of Food Technology and Biotechnology, Zagreb, Croatia

⁵ Military Medical Academy, National Poison Control Center, Belgrade, Serbia

*marijana.curcic@pharmacy.bg.ac.rs

Humans are exposed to the chemicals from very different sources. Therefore, the exposure assessment should be focused on mixtures rather than single chemicals. In this study, bioelements (Zn and Cu) homeostasis effects of mixture of Cd and BDE-209, widely spread persistent environmental pollutants, has been evaluated. In order to evaluate the potential of mixture on Zn and Cu homeostasis in rats kidneys, Wistar rats were treated by oral gavage during 28 days with three doses of Cd 2.5, 7.5, and 15 mg/bw/day, three combinations of Cd with 1000 mg BDE-209/kg/day, and water as a control group. Kidney tissue samples were collected, mineralised, and Cu and Zn levels were measured by flame atomic absorption spectrophotometer. Possible interactions were evaluated comparing the dose-response curves slopes and lower confidence limit of Benchmark dose of 10% (BMDL10) were calculated by PROAST software (RIVM, Netherlands). Cd alone can disturb Zn in kidneys and calculated BMDL10 was 1.713 mg Cd/kg/day, while in combination with BDE-209 it was 1.719 mg/kg/day. Cd disturbs Cu in kidney in significantly higher dose of 5.679 mg Cd/kg/day. However, in combination with the BDE-209, derived BMDL10 was 10 times lower, 0.517 mg Cd/kg/day. Dose-response curve slope for the effect on Cu was significantly lower in the case of mixture effect than in the case of Cd effect. Since Cu plays a major role in the blood cells creation and health of other systems, our results indicate more potent activity of the mixture than single Cd.

References

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UTICAJ SMEŠE CD I BDE-209 NA HOMEOSTAZU ZN I CU U BUBREGU PACOVA

**Marijana Ćurčić^{1*}, Saša Janković², Aleksandra Buha Đorđević¹,
Vesna Milovanović³, Evica Antonijević Miljaković¹, Danijela Đukić-Ćosić¹,
Dragana Javorac¹, Katarina Baralić¹, Katarina Živančević¹, Dragica Božić¹,
Ksenija Durgo⁴, Slavica Vučinić⁵, Zorica Bulat¹, Biljana Antonijević¹**

¹Univerzitet u Beogradu – Farmaceutski fakultet, Katedra za toksikologiju
"Akademik Danilo Soldatović", Beograd, Srbija

²Institut za higijenu i tehnologiju mesa, Beograd, Srbija

³GlaxoSmithKline, Toxicovigilance, Brussels, Belgium

⁴Sveučilište u Zagrebu – Fakultet za tehnologiju hrane i biotehnologiju, Zagreb,
Hrvatska

⁵Vojnomedicinska akademija, Nacionalni centar za kontrolu trovanja, Beograd,
Srbija

*marijana.curcic@pharmacy.bg.ac.rs

Ljudi mogu biti izloženi hemikalijama iz različitih izvora, te je potrebno procenjivati efekte na bazi izloženosti smešama hemikalija, pre nego pojedinačnim hemikalijama. U studiji je analiziran uticaj smeše Cd i BDE-209, široko rasprostranjenih zagađujućih perzistentnih supstanci, na homeostazu bioelemenata, cinka (Zn) i bakra (Cu). U cilju evaluacije potencijala smeše da naruši homeostazu Zn i Cu u bubrezima pacova, *Wistar* pacovi su oralnom gavažom bili tretirani tokom 28 dana dozama Cd od 2,5, 7,5 i 15 mg/kg/dan, kombinacijama ove tri doze sa 1000 mg BDE-209/kg/dan i vodom kao kontrolom. Tkivo bubrega je izdvojeno, zatim mineralizovano, a sadržaj Zn i Cu je meren atomskom apsorpcionom spektrofotometrijom. Moguće interakcije su procenjivane poređenjem nagiba krivih doza-odgovor, a izračunate su i donje granice pouzdanosti *Benchmark* doze od 10% (BMDL10) korišćenjem PROAST softvera (RIVM, Holandija). Cd primenjen sam utiče na homeostazu Zn u bubregu i izračunata BMDL10 iznosi 1,713 mg/kg/dan, dok u kombinaciji sa BDE-209 iznosi 1,719 mg/kg/dan. Cd ometa homeostazu Cu u bubregu pacova i BMDL10 iznosi 5,679 mg/kg/dan, dok je u kombinaciji sa BDE-209 BMDL 10 puta niža i iznosi 0,517 mg/kg/dan. Nagib krive doza odgovor za smešu Cd i BDE-209 bio je daleko niži od nagiba krive doza-odgovor za Cd. S obzirom na to da Cu igra značajnu ulogu u nastanku krvnih ćelija, ali i u očuvanju durgih sistema organa, dobijeni rezultati iziskuju pažnju zbog daleko potentnijeg uticaja smeše na nivo Cu u odnosu na uticaj samog Cd.

Literatura

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