OP – 26

Pilot study assessing gut toxicity in acute self-poisoning using a novel biomarker Intestinal Fatty Acid Binding Protein

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Objective: Gut toxicity or reactive gastropathy is expected following oral ingestion of various toxins. However, the extent of enterocyte damage has not been previously quantified. Intestinal Fatty Acid Binding Protein (I-FABP) is a cystolic protein specific to intestinal epithelial cells that are released into systemic circulation if direct gut injury occurs[1]. Using this novel biomarker, this pilot study attempted to quantify the extent of gut injury by Gloriosa, Oleander, Organophosphates (in various solvents), Paracetamol, Glyphosate, MCPA and Propanil. Understanding gut toxicity in acute self-poisoning may be clinically useful as direct damage to the single layer of enterocytes may promote bacterial translocation leading to sepsis and worsening morbidity.

Methods: Twenty patients with serial plasma samples were retrospectively tested for I-FABP on healthy controls, Gloriosa, Oleander, Organophosphates (in its various solvents), Glyphosate, MCPA, Propanil and Paracetamol. I-FABP was tested using the technique of ELISA with kits from Hycult Biotechnology, Netherlands.

Results: The median I-FABP for healthy controls was 270.1 pg/mL (IQR 153.5 – 558.0 pg/mL) compared to Gloriosa 1179.0 pg/mL (IQR 393.1 – 3342.0 pg/mL), Oleander 1216.0 pg/mL (IQR 731.2 – 2157.0 pg/mL), organophosphates 760.6 pg/mL (IQR 437.7 – 1587.0 pg/mL), paracetamol 432.5 pg/mL (IQR 258.6 – 986.1 pg/mL), glyphosate 477.0 pg/mL (IQR 225.7 – 1804.0 pg/mL), propanil 630.0 pg/mL (IQR 23.5 – 1390.0 pg/mL) and MCPA 424.5 pg/mL (IQR 23.5 – 1136.0 pg/mL). Median I-FABP was significantly elevated compared to control in Gloriosa ($p<0.001$), Oleander ($p<0.001$), organophosphates ($p<0.001$), paracetamol ($p=0.03$), glyphosate ($p<0.05$) but not significant for MCPA ($p=0.22$) and propanil ($p=0.77$).

Conclusion: Gut toxicity following oral ingestion of toxins can be quantified with the novel biomarker I-FABP with significantly elevated levels shown in patients with self-poisoning of Gloriosa, Oleander, glyphosate, paracetamol and organophosphates compared to healthy controls. Further research is required to determine the utility of I-FABP as a biomarker and whether the extent of reactive gastropathy can predict complications such as sepsis or worsening clinical outcomes.