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Poster

## [P25-11] P25-11: Clinical toxicology (1)

Chair: Kenji Ikeda, Japan

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## [P25-11-7] Evaluation of toxicological risk due to the presence of bisphenol A in thermal papers

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### Background

Bisphenol A (BPA) is a chemical compound present in thermal papers widely used in commercial applications. In 2015, EFSA performed a risk assesment, based on a recent toxicity data, and established a Tolerable Daily Intake (TDI) of 4  $\mu\text{g}/\text{body weight}/\text{day}$ . The objective of this study was to evaluate the presence of BPA in thermal paper samples obtained in Brazil, establishing its potential toxicological risk in individuals highly expose to BPA.

### Methods

The concentrations of BPA were determined in 20 thermal paper samples. An aliquot of 30 mg was placed in a screw glass tube and added with 2 mL of methanol, followed by 2 cycles of 30 seconds homogenization in vortex and 10 minutes sonication. After, 100  $\mu\text{L}$  of the solution was transferred to a new tube and diluted with 5 mL of methanol. A 10  $\mu\text{L}$  aliquot was analyzed into a HPLC-FL system with a Zorbax C8 column (150x4.6 mm, 5m) at 30 °C. Mobile phase was 1% of acetic acid in water, acetonitrile and methanol (60:35:5, v/v/v) at 0.9 mL/min. Daily BPA calibration curves were performed from 0.5-10  $\mu\text{g}/\text{mL}$ . The estimated daily intake (EDI) was calculated as follows:  $\text{EDI} = k \times C \times \text{HF} \times \text{HT} \times \text{AF} \times 10^6$  (ng/day); k is the paper-to-skin transfer coefficient (21522.4 ng/s); C is the concentration in thermal paper in  $\mu\text{g}/\text{g}$ ; HF is the handling frequency; HT is the handling time (5 s); AF is the absorption factor of BPA by skin (27%).

### Results

The limit of detection was 0.15  $\mu\text{g mL}^{-1}$ , corresponding to a concentration of 0.05 mg/100 mg BPA in a 30 mg sample. The frequency of detection was 65%, with concentrations ranging from 16.43 mg/g to 20.2 mg/g. Considering a high frequency of thermal paper handling (1100 times/day), the exposure values ranged from 5,769.5 to 9,200.8 ng/kg body weight/day, being the lowest value over the maximum TDI level.

### Conclusions

BPA risk evaluation is especially important for workers with extreme exposures, requiring more careful monitoring and exposure mitigation measures, such as the use of gloves and other protective measures.