

Mercury contamination in facial skin lightening creams and its health risks to user

ABSTRACT

This study aims to determine concentrations of mercury in facial skin lightening cream according to different price categories (category I: <RM29.99, category II: RM30.00-RM59.99, category III: RM60.00-RM99.99 and category IV: \geq RM100.00) and their potential health risks to users. Prices of skin lightening creams were determined during a preliminary market survey. Thereafter, twenty samples were purchased from various locations such as cosmetic stalls, beauty shops, pharmacies and street vendors based on their stratified price categories. Samples were extracted using microwave digester and analyzed using cold vapor atomic absorption spectrometry (CV-AAS). Non-carcinogenic chronic health risks for application of facial skin lightening cream were calculated using Dermal Absorption Dose (DAD) and Hazard Quotient (HQ). Concentrations of mercury in samples were less than the United States Food and Drug Administration (USFDA) permitted trace levels (<1 ppm) except for one sample from category III which was manufactured in China. Concentrations of mercury in facial skin lightening creams ranged from not detected to 1.13 mg kg^{-1} . There was no significant association between concentrations of mercury with price categories ($p = 0.12$). There was no significant non-carcinogenic health risk due to daily application of the facial skin lightening creams based on assumption of 30 years exposure period ($\text{HQ} < 1$).

Keyword: Mercury; Cold vapor atomic absorption spectrometry (CV-AAS); Hazard quotient (HQ)