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Hair mercury concentration and hair treatment

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Methylmercury is a well-known neurotoxicant. Low-dose exposure to methylmercury in the prenatal period and the possible developmental effects of this compound in the postnatal period are of great concern. Mercury in hair is a generally accepted biomarker of methylmercury exposure, and permanent waving has been reported to affect the mercury concentration in hair.

We conducted an experimental-field study to examine the changes in the mercury concentration in hair induced by treatments such as permanent waving, straightening and colouring. Hair samples were collected before and after hair treatment by a beautician. The samples were cut in 1-cm or 2-cm segments from hair strands longer than 10cm. Each segment was determined for total mercury concentration by cold-vapour atomic absorption spectrometry. Permanent waving and straightening decreased hair mercury concentration for most of the segments, but colouring did not. Segments from the proximal end showed no significant decrease for 3-cm segments for permanent waving or for 1-cm segments for straightening.

In conclusion, hair samples subjected to straightening may give lower mercury exposure estimates. However, mercury in 3-cm segments from the proximal end of hair samples subjected to permanent waving is a good biomarker of methylmercury exposure representing the exposure during the third trimester when fetuses are considered to be most sensitive to methylmercury exposure, provided that samples are collected around the time of delivery.