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Short communication

Fatal alcohol immersion during the SARS epidemic in Taiwan

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Alcohol (ethanol) can be absorbed through the skin, but intoxication caused by skin absorption is rare, especially in adults. During the epidemic of severe acute respiratory syndrome (SARS) in Taiwan, a 45-year-old woman was found deceased in a bathtub filled with alcohol. She had put herself into the fluid from around 11 p.m. believing it could prevent SARS and was found dead at about 11 a.m. the next day by her family.

Her head was above the fluid level and there was no sign of drowning. Neither trauma nor ingestion of drugs was detected on analysis. No significant fluid was found in her stomach. The fluid in the bathtub was found to contain 40.5% (v/v) of ethanol, and her blood alcohol concentration (BAC) was 1350 mg/100 mL (1.35%). A BAC near 400 mg/100 mL can be lethal [1]. In order to reach this BAC, she should have absorbed about 1500 mL of 40% alcohol according to the formula: $BAC = \frac{\text{ethanol (mg)}}{[\text{volume of distribution (L/kg)} \times \text{body weight (kg)} \times 10]}$ [2]. Since the bathtub was too small to fit her whole body and her head was above the fluid, she was not likely to have drunk a large amount of alcohol. Nevertheless, she might have inhaled

some alcohol, which would have accelerated her intoxication. It is likely that the woman would have exhibited some CNS depression at a BAC of about 100–200 mg/100 mL [2], inhibiting her ability to climb out of the bathtub.

This tragic case has demonstrated that people facing a crisis such as the SARS epidemic may take extreme measures. Skin absorption is a generally overlooked route of exposure to hazardous substances. The public should be informed of the potential of intoxication by alcohol and other chemicals through skin absorption.

References

- [1] K. Todd K, W.A. Berk, R.D. Welch, et al. Prospective analysis of mental status progression in ethanol-intoxicated patients, *Am. J. Emerg. Med.* 10 (1992) 271–273.
- [2] L. Yip., Ethanol, in: L.R. Goldfrank, N.E. Flomenbaum, N.A. Lewin, M.A. Howland, R.S. Huffman, L.S. Nelson (Eds.), *Goldfrank's Toxicologic Emergencies*, seventh ed. The McGraw-Hill Companies Inc., New York, NY, 2002, pp. 952–955.

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