Increasing illegal use of Melanotan: The Barbie drug hype

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Background

The illegal sale of non-registered drugs is an increasing problem. For example, melanotan products (promoted as Barbie Drug, Fig. 1), synthetic analogues of alfa-melanocyte stimulating hormone, are purchased via the Internet and need to be injected to accomplish sunless tanning, sexual stimulation or weight loss.

Melanotan products work as non-selective melanocortin (MC) receptor agonists and help regulate a range of physiological systems, including pigmentation, energy homeostasis and sexual functioning. Melanotan I (Fig. 2) is developed for photodermatoses and has an orphan drug status for treatment of erythropoietic protoporphyria in Europe. 1

Melanotan II (Fig. 3) is misused as a sexual stimulant, due to its ability to produce erections. It is not licensed for use in the general population. In clinical studies reported side effects of melanotan I and II include nausea, fatigue, facial flushing, peripheral vasodilatation, and with melanotan II yawning and spontaneous penile erections. 2-4

In the Netherlands there has been an increase in the number of patients experiencing adverse health effects after self-injecting melanotan II. Before 2012 the Dutch Poisons Information Center (DPIC) was never consulted for these drugs, in 2012 once, and in 2013 five times.

Case reports

Six patients (5 women and 1 man) reported adverse health effects after subcutaneous injection of melanotan II, bought in a Dutch web shop. A therapeutic dose (0.01 mg/kg) was taken once by one patient and during 5 days by another patient. The other 4 patients injected an overdose (up to 10x the recommended dose) once or repeatedly. The patients experienced nausea, vomiting, diaphoresis, dizziness and angina pectoris. The male patient had severe priapism. One patient injected an overdose during 6 days and effects lasted for 1 week. The DPIC informed the responsible product safety authorities and the Dutch web shop withdrew the product.

Discussion

In the literature two case reports of overdose were found. After self-injection of 6 or 10 mg melanotan II, symptoms of tachycardia, hypertension, diaphoresis, agitation, tremor and mydriasis were observed. One patient experienced priapism, and the other patient had rhabdomyolysis and renal dysfunction. 2,5

These cases illustrate that misuse or overdose with melanotan can result in toxicity. Dosing errors are common, probably because the products are sold as powders for subcutaneous injection and users have to prepare a solution and calculate the required amount themselves. Another health concern is that users may not be well trained in giving themselves subcutaneous injections (Fig. 4). Infections may result from unprofessional administration.

Conclusion

Melanotan products are illegal and pose a health risk. Although one specific product is now withdrawn from a Dutch web shop, this product or similar products may still be available via other websites. Surveillance by Poisons Information Centers is important for the early detection of emerging public health problems due to marketed products. Collaboration between Poisons Centers and law enforcement authorities is essential to enable measures to prevent further damage to public health.

References