PostScript

LETTERS

Acetone-free nail polish remover pads: toxicity in a 9-month old

Acetone-free nail polish removers are widely used and perceived as safe. However, an ingredient γ-butyrolactone (GBL) is readily converted into γ-hydroxybutyrate (GHB), which has well-known toxic effects. A previously well 9-month-old child was found sucking on two nail polish remover pads. The period the pads were in his mouth did not exceed 1 min. Within 15 min, he vomited and became drowsy; after 30 min he was in a coma with a Glasgow Coma Score (GCS) of 3. Oxygen was administered while he was transported to the emergency department by ambulance.

On arrival at the emergency department, 60 min post ingestion, his GCS had improved to 6. He had hypotension, bradycardia and was in shock. Blood gases showed a mild respiratory acidosis. Biochemistry was normal. He responded well to fluid resuscitation. By 90 min, his GCS had recovered to 12. This progressed to hyperalertness and extreme giddiness that persisted for several hours. His pupils, which were initially constricted and poorly reactive, became more responsive. The child made a complete recovery within 8 h of ingestion.

This child developed coma and cardiorespiratory compromise after briefly sucking on two nail polish remover pads. We presume that this was due to rapid absorption of ingredients of this product through buccal, sublingual and oral routes. Conditioning nail polish remover pads contain the following as principal ingredients: GBL (84%), butoxyethanol (10%), diethylene glycol (2%), panthenol (1%) and propylene glycol (1%). GBL is rapidly metabolised to GHB, which causes a pattern of toxicity similar to that seen here.

Another case of poisoning and severe toxicity in a 15-month-old child who sucked on an identical product was reported. He became comatose with cardiorespiratory collapse requiring ventilation and intensive care, but made a complete recovery.[1] When contacted after the incident, the manufacturers responded: ''as a cautionary measure, action has been taken to reformulate the products to add a material called Bitrex that makes it more unpalatable and further reduces the risk of unintentional ingestion, a keep out of reach of children message is to be included on the packaging''.

Acetone-free nail polish removers are widely used and were perceived as safe. Our case highlights the dangers of GBL-containing products when ingested.

Tim Savage, Ahmed Khan, Brendan Gerard Loftus
Paediatric Department, University College Hospital, Galway, Ireland

Correspondence to: Professor B G Loftus, Paediatric Department, University College Hospital, New Castle Road, Galway, UK; gerard.loftus@nuigalway.ie

doi: 10.1136/adc.2006.102905

Competing interests: None.

Reference

1 **Brown JJ**, Nanayakkara CS. Acetone free nail polish removers: are they safe? *Clin Toxicol* 2005;**43**:297–9.

TW2 and TW3 bone ages: time to change?

In 1983, the Tanner–Whitehouse 2nd edition (TW2) system of bone ageing was published and has remained the most widely used system in the UK.[1] Several studies have shown that children are maturing more rapidly and reaching a given skeletal maturity score (SMS) at an earlier chronological age.[2] In view of this finding, Tanner and colleagues published a revised 3rd edition for bone ageing in 2001 (TW3).[3] This updated the relationship of the SMS to bone age to deal with the secular trend that had occurred in skeletal maturation since the previous edition. However, this new version has received little publicity and does not seem to be widely used in the UK .

To explore the changes that have occurred between these two publications, we retrospectively compared TW2 RUS (radius, ulna and short bones) and TW3 RUS bone age assessments in 142 children in two diagnostic groups (idiopathic short stature or constitutional delay in growth and puberty and congenital adrenal hyperplasia) with a range of bone ages from delayed to advanced.

The descriptions and manual ratings remain the same for TW2 and TW3, and the calculation of the SMS is the same. However, the centile charts for RUS SMS against age have changed between versions 2 and 3.

TW3 estimates of bone age were younger than TW2, and both were delayed compared with the chronological age in children with idiopathic short stature and constitutional delay in growth and puberty (table 1). For children with congenital adrenal hyperplasia, TW3 estimates of bone age were younger than TW2, and both were advanced compared with chronological age. TW2 and TW3 estimates of bone age are not interchangeable. Figure 1 shows how the differences between the two versions change with increasing maturity score for boys and girls.

The SMS on which the bone age is based is the fundamental unit of measurement for bone maturity assessment, and should be considered alike any other anthropometric measure, such as height or weight. As such, the SMS centile charts require periodic updating if they are to be used to assess development.[4 5] Our results show that TW3 bone age differed from TW2 bone age in the two diagnostic groups studied, with the differences becoming more marked with increasing maturity. This suggests that the currently widely used TW2 bone age may not reflect an accurate skeletal maturity

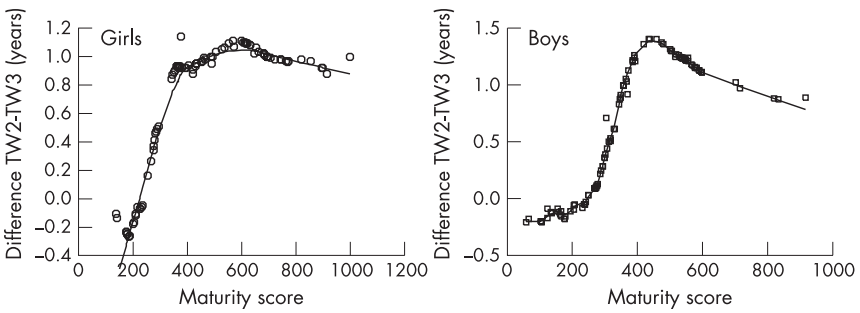

Figure 1 Difference between Tanner-Whitehouse 2nd edition (TW2) and TW3 against maturity score for girls and boys. Points represent individual patients.

Table 1 Mean (standard error of mean) Tanner–Whitehouse 2nd edition (TW2) compared with TW3 bone age estimates for children with idiopathic short stature/ constitutional delay in growth and puberty and congenital adrenal hyperplasia

	ISS/CDGP		CAH	
	Girls	Boys	Girls	Boys
n	24	45	37	36
Chronological age (years)	10.2 (0.8)	11.3 (0.7)	8 (0.5)	9.9 (0.6)
TW2 bone age (years)	9 (0.8)	9.9 (0.6)	9.1 (0.7)	11.5 (0.7)
TW3 bone age (years)	8.5 (0.8)	9.3 (0.6)	8.4 (0.6)	10.7 (0.6)

CAH, congenital adrenal hyperplasia; CDGP, constitutional delay in growth and puberty; ISS, idiopathic short stature; TW2, Tanner–Whitehouse 2nd edition; TW3, Tanner–Whitehouse 3rd edition.