

## Methaemoglobinaemia — out of the wash comes a blue baby\*

Ivan Cher



\* “Out of the blue comes the whitest wash!” was the slogan of Reckitt’s Blue, a blue-powder laundry whitener of the 19th and 20th centuries.



**TO THE EDITOR:** “Out of the blue”, I received a personal message from a retired nursing sister of a children’s hospital, who had earlier written to the *MJA*<sup>1</sup> describing “a cluster of neonates [who had] simultaneously turned blue” in the 1950s. Her letter to me followed one of mine in the *Journal*, describing methaemoglobinaemia (MetHgb) in infantile ketoacidosis, where the cyanosis responded rapidly to diabetic control alone.<sup>2</sup> Rare as MetHgb is, it has previously been recognised as a presentation of infantile acidosis.<sup>3</sup>

The cause of the colour change in the neonate cluster “was traced to dye from the hospital’s landmarks on a batch of new cotton nappies (which had been washed before being marked)”.<sup>1</sup> The dye was understood to have been “absorbed into the infants’ circulation via their raw umbilical areas”.

As it turns out, nappy dyes have been incriminated in MetHgb.<sup>4</sup> The POISIN-DEX® System (Thomson Micromedex, Denver, Colo, USA) revealed that the aniline group is among the compounds capable of causing MetHgb through any portal of entry, even intact skin (Stephen Gibbins, Poisons Information Specialist, Victorian Poisons Information Centre, Melbourne, personal communication). Another textile ink, aminophenol, may also lead to the disorder.<sup>5</sup> Other common causes of MetHgb are given in the Box.

Aniline dyes were discovered in the 19th century and found useful for inks and for dyeing leather, which they penetrate as they do living skin. They were also used in wood stains, textiles, and oriental rug-making. Because aniline dyes are not indelible and are toxic, they are being superseded by chrome dyes.

The hospital linen room concerned<sup>1</sup> reports that they now apply dry, colour-fast pigments using heat-pressed or stamped “transfers” (Administrative Officer, Metropolitan Linen Services, Brisbane, personal communication).

It is not possible to confirm what the “Baby blues”<sup>1</sup> dye was — aniline or other. Nor can we now establish whether the dusky

colour of the babes was due to absorbed dye circulating passively. Circumstantially however, MetHgb would seem to have been a likely possibility.<sup>4</sup>

In differential diagnosis, when cyanotic infants or adults without cardiorespiratory signs are encountered, we should not forget MetHgb, drugs and chemical toxins. In patients with MetHgb, the blood will be “chocolate-brown”; and yes — do remember to take a sniff for that exhaled acetone.<sup>2</sup>

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- 1 Opala R. Baby blues [letter]. *Med J Aust* 1997; 167: 288.
- 2 Cher I. Little boy blue [letter]. *Med J Aust* 2006; 184: 256.
- 3 Yano SS, Danish EH, Hsia YE. Transient methemoglobinemia with acidosis in infants. *J Pediatr* 1982; 100: 415-418.
- 4 Prchal JT. Genetics and pathogenesis of methemoglobinemia. In: Rose BD, editor. *UpToDate*. Waltham, Mass: UpToDate, 2006.
- 5 American Conference of Governmental Industrial Hygienists. *Methemoglobinemia*. <http://www.haz-map.com/methem.html> (accessed Jun 2006).
- 6 Ellenhorn MJ, Barceloux DG. *Medical toxicology: diagnosis and treatment of human poisoning*. New York: Elsevier Science, 1988. □

### Causes of methaemoglobinaemia (MetHgb)

MetHgb can be genetic, through faulty haemoglobins or cytochrome deficiency. On exposure to appropriate exogenous toxins, heterozygotes tend to be particularly susceptible, as are infants per se without any such trait.<sup>4</sup> Nappy dyes have been incriminated.<sup>4</sup>

In the United Kingdom between 1961 and 1980, the most common industrial causes of acquired MetHgb were chloroaniline, *p*-toluidine, nitrobenzene, nitrochlorobenzene, nitrates and amines — frequently by dermal exposure. Nitrates, nitrites in food, local anaesthetics (particularly benzocaine), and other medicinal agents, such as chloroquine, dapsone, para-aminosalicylic acid and resorcinol, have also been implicated.<sup>5,6</sup> ◆