



Two brothers with nail cyanosis

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Cyanosis of fingers and nails in infants and children deserves investigation and treatment of the underlying causes. It may be due to a trivial condition such as acrocyanosis of well neonates, which requires no treatment other than reassurance of the parents. On the other hand, serious cardiopulmonary conditions need to be excluded.¹ These conditions include cyanotic heart disease and chronic pulmonary conditions such as cystic fibrosis and empyema. These conditions are usually accompanied by the clubbing of fingers. Cyanosis without clubbing can also occur in Raynaud's phenomenon.¹ We report the case of two brothers with an unusual cause of 'cyanosis' of fingernails and toenails.

Case report

A sixteen-year-old boy with good past health was evaluated because his fingernails, and subsequently toenails, had become blue over a four-week period. He was a nonsmoker and denied any systemic symptoms, change of dietary habit, injury to the nails, or medication/nail polish consumption. He wore white socks and his shoes were not blue. Over the same period, his elder brother had also developed a similar blue hue in his fingernails and toenails.

Figure 1. Appearance of the fingernails and toenails of the patient who presents with nail 'cyanosis'



Physical examination revealed an apparently well teenager with uniform cyanosis of his toenails, and to a lesser extent in his fingernails (Figure 1). The pulps of his fingers and toes remained pink and the peripheral arterial pulses were normal. Blanching of the finger and toe tips did not alter the cyanosis, suggesting that the

discolouration was in the nail plate rather than the vascular nail bed. There was no central cyanosis or cardiopulmonary abnormality and his examination was unremarkable. His oxygen saturation was 99% in room air. Laboratory investigations were as follows: haemoglobin 14.0 g/dl; white blood count $7.4 \times 10^9/l$ with normal differentials; platelet count $282 \times 10^9/l$. Complement C3 was 1.31 g/l (reference range 0.62 to 1.87), and C4 was 0.27 g/l (reference range 0.20 to 0.59). Liver function and renal function tests were normal. Rheumatoid factor and anti-nuclear antibodies were negative. Urine analysis was also unremarkable.

As there was no clubbing or cardiopulmonary abnormality to explain his nail cyanosis, a nail-trim biopsy was scheduled in order to rule out abnormal pigment deposition in the nail matrix. The 'cyanosis' was accidentally removed by alcohol swab prior to nail biopsy. Further inquiry revealed that the discolouration was due to the dye from new blankets purchased and used by the two brothers in the preceding four weeks. Interestingly, the two brothers used separate blankets and slept in separate rooms.

Discussion

Nail discolouration due to dyeing has not been reported as a differential diagnosis for peripheral cyanosis. In our patient, there was no history of subungual haematoma or antimalarial use, and no evidence of Raynaud's phenomenon, central cyanosis or cardiopulmonary disease. His oxygen saturation was good. The finger and nail pulps remained pink and suggested that the problem primarily lay within the nail parenchyma. Blue nails secondary to chronic silver exposure, alcaptonuria and HIV have been reported in the literature.²⁻⁴ Poisoning with a drug or chemical should be suspected in any child who presents with sudden-onset cyanosis. A number of compounds activate haemoglobin oxidation from the ferrous to the ferric state to form methaemoglobin. These include nitrites and nitrate (contaminated water), chlorates, quinines, aniline dyes, sulfonamides, acetanilid, phenacetin bismuth subnitrate and potassium chlorate.⁵⁻⁷ In a male with completely negative clinical findings and normal oxygen saturations, we suggest that 'dyed nails' should be considered as a differential diagnosis of nail cyanosis.

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