Picture quiz – Answers

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1. Propanil [N-(3,4-dichlorophenyl) propanamide] is a contact herbicide widely used for paddy cultivation. It causes methaemoglobinaemia (metHb), tissue hypoxia, central nervous system and respiratory depression. The antidote for metHb is methylene blue. Methylene blue is considered the first line antidote in acute symptomatic propanil poisoning. Methylene blue acts by reacting within red blood cells to form leukomethylene blue, which is a reducing agent of oxidized hemoglobin converting the ferric ion (fe^{+++}) back to its oxygen carrying ferrous state (fe^{++})[1,2]. The patient was treated with methylene blue (dye) hence the urine colour. Urinary excretion of methylene blue peaks approximately 2-6 h after oral administration and may remain detectable after 24 h.

2. Purple urine bag syndrome is an uncommon clinical entity. It is characterised by purple colour of urine in the setting of a urinary tract infection. Indoxyl sulphate is excessively excreted in the urine and is digested into indoxyl by the enzyme sulphatase/phosphatase produced by certain bacteria such as *Pseudomonas aeruginosa, Proteus irabilis, Morganella morganii and Escherichia coli.* Indoxyl then changes into indigo (blue) and indirubin (red) in alkaline urine[3]. These pigments mix and react with plastic catheter tubing and bag to produce a purple hue.

   There are multiple predisposing factors such as female gender, advanced age, constipation, institutionalization, long-term catheterization, dementia and chronic kidney disease[4]. Usually the patient is asymptomatic but it is important to manage the urinary infection appropriately as it has a high morbidity and mortality due to associated co-morbidities.

3. Alkaptonuria (AKU), a rare autosomal recessive disorder caused by the deficiency of homogentisate[1,2] dioxygenase activity[5]. This results in an accumulation of homogentisic acid in the urine and increased pigmentation (ochronosis) in cartilage and connective tissue. Upon contact with air, homogentisic acid is oxidized to form a pigment like polymeric material which makes urine black when exposed to air. As freshly voided urine appears normal in colour, patients do not often report dark urine. As the polymer accumulates within cartilage, a process that takes many years, the normally transparent tissues become slate blue, an effect ordinarily not seen until adulthood.

References

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