# Is propofol safe to use in children with food allergies?

Propofol (2,6-di-isopropylphenol) is widely used for anaesthesia and sedation. The drug is formulated as a fatty emulsion containing egg lecithin and soybean oil (Fresenius Kabi, 2010). Its use in children with known food allergy to soya or egg products, or cross-related allergens such as peanuts, is a subject of debate, with some considering it a contraindication to use.

The deliberate administration of an allergen to a known allergic patient is clearly ill-advised, but to what degree does this apply to food allergies and pharmaceutical products containing derivatives? There is a scarcity of evidence on this subject. A survey conducted by the Association of Paediatric Anaesthetists of Great Britain and Ireland demonstrated considerable variation among anaesthetists' opinions on the safety of propofol use in this context, with no clear consensus. With worldwide prevalence of food allergies rising among children, this is a dilemma anaesthetists are likely to increasingly face.

## Propofol should not be used

Warnings against the use of propofol in patients with food allergies are included in the manufacturer's leaflets, with the Fresenius Kabi (2010) product leaflet advising avoidance 'if you are hypersensitive to propofol or to any of the other ingredients of this medicine' and more specifically 'if you are hypersensitive to soya or peanut'.

Cases of propofol-induced anaphylaxis have been described (Dziedzic, 2016). While reviews of propofol use in patients with food allergies have not demonstrated significant allergic cross-reactivity, case numbers were small and potentially unlikely to detect this complication (Wiskin et al, 2015). Many studies excluded children, the patient group where arguably food allergenicity is most relevant having not yet evolved natural tolerance, with authors admitting an inability to draw conclusions in relation to children (Asserhøj et al, 2016). The significant morbidity and mortality associated with anaphylaxis should not be disregarded.

Propofol is one of many anaesthetic agents and suitable alternatives exist to meet the requirements of sedation and anaesthesia in children. At a time when 'perioperative anaphylaxis' is under the microscope – the subject of the current National Audit Project – it seems rational to avoid propofol administration in children with known allergy to some of its raw constituents.

## Propofol can be used

Propofol is commonly used for induction and maintenance of anaesthesia and sedation, as well as being valuable in the management of acute laryngospasm. It has a favourable drug profile with relatively quick onset and recovery. Its familiarity of use among anaesthetists confers an additional degree of safety.

Early propofol preparations were associated with a significant incidence of anaphylactoid reactions, so it was re-formulated to reduce allergenicity. The manufacturing process alters the soya bean component to an end-product with negligible protein content, which is unlikely to contain significant quantities of protein allergenic particles. The egg lecithin components are derived from the egg yolk, avoiding the principal allergens implicated in egg anaphylaxis: proteins (ovoalbumin, ovomucoid and conalbumin) found only in the egg white (Molina-Infante et al, 2014; Asserhøj et al, 2016).

Wiskin et al (2015) reviewed 149 cases of propofol administration in children with confirmed soya and/or egg allergies and found no cases of cross-related allergic reaction. This is consistent with a review of 400 procedures in adults with confirmed food allergies receiving propofol, where no allergic reactions were reported (Molina-Infante et al, 2014). A larger literature review identified 45 cases of propofol allergy, but no patient demonstrated isolated allergy to the emulsion component of the drug (Molina-Infante et al, 2014). The antigenic determinant in propofol allergy is thought to be the iso-propyl or phenol groups, so an allergy to the drug itself, rather than its emulsion carrier vehicle (Molina-Infante et al, 2014; Asserhøj et al, 2016). These authors conclude that propofol use is likely to be safe in patients with food allergy.

## Conclusions

The available evidence suggests that propofol is likely to be safe for use in children with food allergies and there is little evidence to support its avoidance. The final decision for its use is at the discretion of the individual anaesthetist, after patient assessment and consideration of alternatives. As is the case following the administration of any agent to atopic children, the anaesthetist should remain vigilant for signs of potential anaphylaxis and be prepared to respond accordingly. **BJHM**

**Dr Natalie Forshaw**, Post CCT-Clinical Fellow in Paediatric Anaesthesia, Great Ormond Street Hospital, London WC1N 3JH

**Dr Jonathan Smith**, Consultant Anaesthetist and College Tutor, Department of Anaesthesia, Great Ormond Street Hospital, London

Correspondence to: Dr N Forshaw (natalieforshaw@doctors.org.uk)

Asserhøj LL, Mosbech H, Krøigaard M, Garvey LH (2016) No evidence for contraindications to the use of propofol in adults allergic to egg, soy or peanut. *Br J Anaesth* **116**(1): 77–82. https://doi.org/10.1093/bja/aev360

Dziedzic A (2016) Is propofol safe for food allergy patients? A review of the evidence. *SAAD Dig* **32**: 23–27.

Fresenius Kabi (2010) Fresenius Propoven 1% Package leaflet: Information for the user; Product information leaflet. Fresenius Kabi, Runcorn

Molina-Infante J, Arias A, Vara-Brenes D, Prados-Manzano R, Gonzalez-Cervera J, Alvarado-Arenas M, Lucendo AJ (2014) Propofol administration is safe in adult eosinophilic esophagitis patients sensitized to egg, soy, or peanut. *Allergy* **69**(3): 388–394. https://doi.org/10.1111/all.12360

Wiskin AE, Smith J, Wan SKY, Nally MWJ, Shah N (2015) Propofol anaesthesia is safe in children with food allergy undergoing endoscopy. *Br J Anaesth* **115**(1): 145–146. https://doi.org/10.1093/bja/aev177

Anaesthetic and critical care dilemmas are coordinated by **Dr Rob Anker**, Anaesthetic Registrar (ST6), Royal Marsden Hospital, London and **Dr Prashanth Nandhabalan**, Specialist Registrar in Anaesthesia and Intensive Care, King's College Hospital NHS Foundation Trust, London