Arquivos Brasileiros de
Oftalmologia
PUBLICAÇÃO OFICIAL DO
CONSELHO BRASILEIRO
DE OFTALMOLOGIA

COMMENTED PAPERS - EDITORS CHOICE

Iodine allergy and endophthalmitis prevention

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Endophthalmitis is associated with a poor visual prognosis, and intraocular procedures are among its leading causes. To mitigate this risk, several preventive measures are routinely implemented in ophthalmic surgery. Because the primary source of infection is the bacterial flora of the ocular surface, perioperative antisepsis is essential in reducing complication rates. The application of topical povidone-iodine in the conjunctival sac minutes before surgery is a widely adopted standard practice worldwide[1].

In patients reporting allergies to iodine, seafood, or iodinated contrast media, some surgeons withhold povidone-iodine due to concerns about presumed cross-reactive hypersensitivity[2]. However, this association, first proposed in the 1970s, has since been refuted by subsequent evidence[3].

True allergy to povidone-iodine is rare and is generally attributed to the povidone component rather than iodine itself. Iodine allergy is considered biologically implausible because iodine is an essential element required for thyroid metabolism and is chemically too simple to elicit an immune-mediated response[3,4]. Moreover, seafood allergy is typically IgE-mediated and directed against specific proteins in marine organisms, whereas reactions to iodinated contrast media are most often non-IgE-mediated and nonimmunologic[4]. Therefore, a history of allergy to iodine, iodinated contrast media, or seafood should not be regarded as a contraindication to the use of povidone-iodine.

This review discusses alternatives to conjunctival povidone-iodine in ocular surgery. Chlorhexidine, a cationic biguanide with broad-spectrum activity against gram-positive and gram-negative bacteria, is a primary alternative. It has been used in Sweden since 1999 and has demonstrated efficacy in real-world clinical settings. It is recommended in cases of confirmed povidone-iodine allergy. However, reports of microorganisms resistant to chlorhexidine have been documented, whereas no clinically relevant resistance to povidone-iodine has been reported[5]. Another consideration is that, although chlorhexidine may cause less patient discomfort, it has been associated with a higher incidence of true hypersensitivity reactions compared with povidone-iodine and may frequently lead to dermatitis[6].

Other antiseptics, such as picloxydine dihydrochloride, hypochlorous acid solution, and polyhexanide, are promising; however, current evidence supporting their routine ophthalmic use remains limited[5].

The article also addresses the inherent epithelial toxicity of povidone-iodine. In healthy patients, 5% povidone-iodine application has been associated with transient corneal staining lasting up to 24 h. Consequently, some cases of presumed hypersensitivity may represent epithelial toxicity or intolerance rather than true allergic reactions. In such cases, lowering the concentration of povidone-iodine may improve patient tolerance while maintaining antiseptic efficacy[5].

http://dx.doi.org/10.5935/0004-2749.eRes42026

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Article reference of the review
Kanclerz P, Myers WG. Chlorhexidine and other alternatives for povidone-iodine in ophthalmic surgery: review of comparative studies. J Cataract Refract Surg. 2022;48(3):363-369.

The authors conclude that, although alternative agents show promise, current evidence is insufficient to support replacing topical povidone-iodine for endophthalmitis prophylaxis. Further studies are required to determine the comparative benefits and safety profiles of these alternative agents[5].

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