Beta radiation for glaucoma surgery

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ABSTRACT

BACKGROUND: The outcome of glaucoma surgery can be affected by the rate at which the surgical wound heals. Beta radiation has been proposed as a rapid and simple treatment to slow down the healing response.

OBJECTIVE: To assess the effectiveness of beta radiation during glaucoma surgery (trabeculectomy).

CRITERIA FOR CONSIDERING STUDIES FOR THIS REVIEW: We searched the Cochrane Central Register of Controlled Trials (Central) in The Cochrane Library (which includes the Cochrane Eyes and Vision Group Trials Register) (Issue 4 2008), Medline (January 1966 to October 2008) and Embase (January 1980 to October 2008). The databases were last searched on 24 October 2008.

SELECTION CRITERIA: We included randomized controlled trials comparing trabeculectomy with beta radiation to trabeculectomy without beta radiation.

DATA COLLECTION AND ANALYSIS: We collected data on surgical failure (intraocular pressure > 21 mmHg), intraocular pressure and adverse effects of glaucoma surgery. We pooled data using a fixed-effect model.

MAIN RESULTS: We found four trials that randomized 551 people to trabeculectomy with beta irradiation versus trabeculectomy alone. Two trials were in Caucasian people (126 people), one trial in black African people (320 people) and one trial in Chinese people (105 people). People who had trabeculectomy with beta irradiation had a lower risk of surgical failure compared to people who had trabeculectomy alone (pooled risk ratio (RR) 0.23 (95% CI 0.14 to 0.40). Beta irradiation was associated with an increased risk of cataract (RR 2.89, 95% CI 1.39 to 6.0).

AUTHORS' CONCLUSIONS: Trabeculectomy with beta irradiation has a lower risk of surgical failure compared to trabeculectomy alone. A trial of beta irradiation versus anti-metabolite is warranted.

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For Latin America and the Caribbean, the full text is freely available from: http://cochrane.bvsalud.org/cochrane/show.php?db=reviews&mfn=1834&id=CD003433&lang=pt&dblang=&lib=COC&print=yes.

REFERENCE

1. Kirwan JF, Rennie C, Evans JR. Beta radiation for glaucoma surgery. Cochrane Database Syst Rev. 2009;(2):CD003433.

COMMENTS

Trabeculectomy is a surgical procedure used to control intraocular pressure in glaucoma patients who do not respond to clinical treatment. Success in this type of surgery is limited by the scleral healing process, which may result in fibrosis of the surgical flap and bubble failure.

Technically well-conducted procedures and postoperative use of anti-inflammatory agents to reduce fibroblastic activity have not been enough to increase the success rate. Some studies have shown the possibility of improving these results using other resources to inhibit fibroblasts such as beta radiation. This is generally applied through a radioactive plaque at the surgical site, with the aim of decreasing the number of fibroblasts and consequently the chance of fibrosis of the flap.

The study presents randomized trials comparing patients who underwent trabeculectomy either with or without beta radiation. Like other studies in the literature, this study shows that beta radiation was effective in increasing surgical success.

Although a large number of patients were studied, the analysis left certain questions open, in that no groupings or clarifications regarding types of glaucoma were made. Moreover, no appropriate correlations among different ethnic groups were established. Groups of Caucasians and blacks were studied without any observations regarding healing in different ethnic groups and whether this might interfere with the results. The literature shows that beta radiation is particularly efficient following trabeculectomy among black patients.

The study reports that the patients who received beta radiation did not develop postoperative cataracts to any significant extent, as also reported elsewhere in the literature. However, the study did not cover the side effects that may arise due to beta radiation, such as scleral thinning and even tissue metaplasia. Hence, further studies need to be developed to address these complications.

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