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Therapeutic and preventive effect of topical Bevacizumab on corneal angiogenesis in the rabbit model

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Purpose: To evaluate the preventive and therapeutic effects of topical Bevacizumab on experimentally induced corneal neovascularization in a rabbit model.
Methods: A rabbit model of suture-induced corneal neovascularization was used to assess the topical anti-angiogenic role of bevacizumab. After suture was performed at day 0, animals were divided into the following groups: A: Control Group (n=4): receiving saline solution eye drops tid during 14 days beginning in the same day suture was performed. B: Therapeutic group (n=6): receiving 25mg/ml bevacizumab eye drops tid from day 14 to day 28. C: Preventive group (n=6): receiving bevacizumab 25mg/ml eye drops tid from day 0 to day 14. All the animals were evaluated and biomicroscopic photographed in the 7th (D7), 14th (D14), 21st (D21) and 28th (D28) day after the start of angiogenic stimulus with suturing. By the 28th day animals were sacrificed and the eyes were sent to immunohistochemical analysis. Images were morphometrically analyzed using the image processing and analysis software Image J 1.31v. (Wayne Rasband Research Services Branch, National Institute of Mental Health, Bethesda, USA). Statistical analysis was performed to compare three parameters of neovascularization regression among each of groups: area of neovascularization, radial length of the longer neovessel and limbar length of the neovascularizarion area: values for $p<0.05$ considered statistically significant.
Results: Area of neovascularization was significantly decreased in the Preventive group at D7 (average area of 386,649 pixels in group A, 241,459 pixels in group B and 45,964 pixels in group C; $p<0.05$). Preventive Group had also smaller areas of neovascularization in D14, D21 and D28. Other parameters presented analogous results, in D7 radial length of the longer neovessel values (497,994 in group A, 329,266 in group B and 135,026 in group C) and limbar length of the neovascularization area (1,104 pixels in group A, 1,306 pixels in group B and 688 pixels in group C) showed decreased measures in Preventive group with statistical significance. Immunohistochemical analysis is under process.
Conclusions: Bevacizumab showed to be effective in minimizing neovascularization when applied early in angiogenic stimuli process, though it

was ineffective in regressing neovascularization when administered later in the creased disease. These results might reflect a different action of this drug depending on the maturation degree of the corneal angiogenesis and may be clinical relevant for its use in human eyes.