Role of Notch1-Dll4 Signalling Pathway in Mice Model of Oxygen-induced Retinopathy

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OBJECTIVES

To investigate the role that Notch1-DLL4 signal pathway played in the oxygen-induced retinal neovascularization of mice by analyzing the expression of DLL4, VEGFR-1, and VEGFR-2 in retinal neovascularization.

METHODS

Sixty 7-day-old mice were divided into oxygen-induced retinopathy group and control group. We took ten mice from each group at postnatal day 7 (p7), p12 and p17 respectively, and then used the retinas to extract RNA. We detected mRNA expression of DLL4, VEGFR-1 and VEGFR-2 by RT-PCR.

RESULTS

VEGFR-1 expression of retinopathy group was lower than the control group in p17. P=0.022). There was no statistically significant difference in VEGFR-2 expression between these two groups in each timing. P>0.05. DLL4 expression of retinopathy group became lower in p12 and p17. P=0.022). As time went on, the expression of VEGFR-1 and DLL4 protein decreased (P<0.05), and that of VEGFR-2 increased P<0.05) in retinopathy group. In control group, the expression of VEGFR-1 and DLL4 protein didn't change a lot from p7 to p17 (P<0.05), and that of VEGFR-2 increased P=0.001. It showed positive correlation between DLL4 and VEGFR-1, r=0.905, P0.001.

CONCLUSIONS

Notch1-DLL4 signalling pathway may be involved in the regulation of VEGF in the process of retinal angiogenesis. The expression of DLL4 was inhibited in oxygen-induced retinopathy mice during the formation of neovascularization, so it failed to show negative feedback regulation to VEGF. DLL4 restrained the expression of VEGF by the up-regulation of VEGFR-1.

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