Macrophage Activation Pattern in Human Myopic Choroidal Neovascular Membranes

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Abstract

\textbf{Purpose:} A little is known about the role of macrophages in myopic choroidal neovascular membrane (CNV) pathogenesis. The present study aimed to characterize the pattern of macrophage activation in CNV caused by degenerative myopia compared to that caused by age related macular degeneration (AMD).

\textbf{Methods:} 20 surgically excised CNV derived from 15 AMD (5 classic and 10 occult CNV) patient and 5 patient with degenerative myopia were stained using CD68, CCR7 and CD163 antibodies staining for pan macrophages, classically activated macrophage (M1 macrophages) and alternatively activated macrophage (M2 macrophages); respectively. The immunopositive cell density was calculated per mm\textsuperscript{2} in 400x images.

\textbf{Results:} All CNVs were untreated and subfoveally located. Macrophage infiltration was higher in the myopic CNV with a cell density of M: 268.4\pm117.78; M1: 137.8 \pm 189.5; M2: 453.6\pm313 cell/mm\textsuperscript{2}. In classic AMD related CNV, the cell density of M macrophages were 251.6\pm72.8 cell/mm\textsuperscript{2}, M1 macrophages: 131.4\pm94.38, and M2 macrophages: 122.8\pm64.10 cell/mm\textsuperscript{2}. In occult AMD related CNV, the cell density of M macrophages were 301\pm159 cell/mm\textsuperscript{2}, M1 macrophages: 167 \pm 90 cell/mm\textsuperscript{2} and M2:167 \pm 89 cell/mm\textsuperscript{2}. Alternatively activated macrophages were the dominant type in myopic CNV (p value: 0.043) and differ significantly from both classic and occult AMD CNV, (p value: 0.008, 0.01) respectively.

\textbf{Conclusions:} Alternatively activated macrophages might play an important role in the myopic CNV pathogenesis. The identification of different activation patterns may be important for distinct therapeutic strategies.
Fig. 1 Macrophage polarized activation. A simplified view of immune and tissue-derived signals inducing classical (M1) and alternative (M2) macrophage polarized activation. The main functional effects on macrophage functions, molecular markers and effector molecules are schematically represented in both cases.

**Keywords**: 605 myopia • 453 choroid: neovascularization • 638 pathology: human

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