Neurotrophins and their receptors in endometriosis lesions: an immunohistochemical study

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Context: The role of NGF and BDNF in neural growth and development are already known. In endometriosis, this complex system has not fully elucidated yet. Objective: to study innervation of endometriosis lesions through the expression of BDNF, NGF and receptor trkA, trkB and p75 in deep infiltrating endometriosis (DIE) in comparison to peritoneal endometriosis (PE). Methods: PE lesions (n=15) and DIE lesions (n=15) were immunostained and analysed with anti-BDNF, anti-NGF, anti-trkA, anti-trkB, anti-p75, anti-PGP9.5 and anti-TH antibodies. Result: The percentage of BDNF-positive immunostaining cells was greater than 75% in both groups. Both gland and stroma cells of DIE lesions had a lower percentage of NGF-positive immunostaining cells compared to those in PE lesions (p<0.001 and p<0.02, respectively). There was no significant reduction in the trkA positive immunostaining cells, which are the main NGF-receptor, results in DIE lesions. The major BDNF receptor, trkB, in stroma only showed lower percentage of immunostaining cells in PE compared to in DIE (p<0.002). The percentage of P75 positive staining cells in DIE tissues tended to be higher than in PE tissue (gland, p<0.02. The mean nerve density per mm2 of TH positively immunostaining nerve fibers was 1.5 fold and more than 1.5-fold greater number of PGP9.5 positively immunostaining nerve fibers in DIE compared to PE (not significant). Conclusion: BDNF-trkB signaling is higher in DIE lesions compared to PE lesions because of the observed corresponding low abundance of trkB in PE. This may imply that BDNF-trkB signaling is important for the infiltrating process of endometriosis cells. NGF-trkA signaling, which was lower in DIE compared to PE, does not play a similar role. P75 receptor is likely not a marker of apoptosis, as has been shown in certain cancers, but instead may be a marker of cell growth.

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