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Expression of VEGF, VEGFR, FGF, HIF1a, HIF3a and female sex hormone receptors in pregnancy tumor of the gingiva

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Objective: Oral pregnancy tumor (PT) or pregnancy epulis is the most striking oral lesion during pregnancy and is indistinguishable from oral pyogenic granuloma (PG). Hormonal changes during pregnancy may play a causative role in the development of this lesion. The purpose of the present study was to investigate the expression of estrogen receptor (ER), progesterone receptor (PgR), angiogenic factors such as vascular endothelial growth factor (VEGF) and its receptor (VEGFR), fibroblast growth factor (FGF) and the proangiogenic transcription factors hypoxia inducible factor (HIF)1a and HIF3a in the pathogenesis of PT.
Design & Methods: ER, PgR, VEGF, VEGFR, FGF, HIF1a and HIF3a where immuno-histochemically evaluated in paraffin embedded tissue specimens of 9 cases of PTs and were compared to a group of 9 cases of PGs in non-pregnant young women and another group of 10 cases in post-menopausal women.
Results: Statistical analysis of the results indicated that expression of VEGF in stromal histiocytes and endothelial cells of small vessels was positively correlated in the PTs group but not in the controls ($P<0.05$, chitest). Consistent with this observation was also the positivity for VEGFR that was overexpressed in stromal histiocytes and endothelial cells of PTs as compared to PGs of non-pregnant and post-menopausal women ($p<0.005$, chitest). Furthermore, three out of nine (33%) and two out of nine (22%) of the pregnant and pre-menopausal non-pregnant females expressed PgRs in the PGs and PTs groups respectively, as opposed to the lack of PgRs expression in the PGs of post-menopausal women. No correlation was found between ERs, PgRs, VEGF and FGF expression within the groups. Noteworthy, HIF1a and HIF3a immunopositivity was not elevated in the pregnant group as compared to the controls.
Conclusions: Our results indicated that VEGF but not FGF expression was increased in PTs implying that VEGF-related angiogenesis may be associated with the tendency for hemorrhage seen in these lesions. Furthermore, the absence of increased immunopositivity for HIF1a and HIF3a in PTs, despite the high VEGFR expression, implies that VEGF-related angiogenesis during pregnancy may be induced by signaling pathways that do not depend on HIFs. Inhibition of VEGF activity in PGs especially in pregnant women may be a promising mode of therapy. Additional studies are needed in order to confirm and extend our findings.