S100P highly expressed in implantation-site and effects on interaction of fetal-maternal face by combining with ezrin

Objective  S100P is a member of the S100 family known as small molecular weight calcium-binding proteins. Increased levels of S100P have been observed to mediate tumor growth, invasion, survival, metastasis and angiogenesis. Recent studies showed that S100P was specifically up-regulated in human endometrium during the implantation window, but it is not clear what role S100P plays in embryo implantation and maternal- fetal interface. The purpose of the present study is to explore the role that S100P plays in implantation. Methods  The mouse implantation model was employed to investigate S100P location and combination with its ligands at the maternal-fetal interface during peri-implantation period, and ESC-Bbewo sphere co-culture system was used as an in vitro model of implantation to explore effects of S100P on maternal-fetal interaction. Result(s)  The results demonstrated for the first time that: (1) S100P was much higher in pregnant than non-pregnant endometrium and reached the highest level at d4.5 of pregnancy. Besides, S100P location transferred from cytoplasmic and nucleus of LE and GE to nucleus of stroma cells in decidua after d4.5 of pregnancy. Interestinly, S100P expression peak on D4.5 also existed in the endometrium of pseudopregnant mice. (2) The density of S100P was higher at the implantation site than inter-implantation site on d4.5. S100P localized mainly at the cytoplasm and nucleus of stroma cells under the LE surrounding the embryo at the beginning of implantation, from then on, S100P transferred to nucleus of stromal cells in the decidua surrounding the embryo. (3) Con-focal analysis showed that S100P colocalized with ezrin, a ligand of S100P, in endometrium before implantation, and in embryo and deciduas inter-face of implantatin. RAGE, another ligand of S100P, showed a similar expression pattern to S100P, but no overlap with S100P in inter-implantation site was observed. (4) The overexpression of S100P facilitated the invasion of Bewo sphere to ESCs, and the RNA interference of S100P inhibited the adhesion of Bewo sphere to ESCs. Meanwhile, Con-focal analysis indicated the overlap exists between S100P and ezrin when Bewo sphere invased and adhere to ESCs. Conclusions  The study suggested that S100P plays an important role in embryo implantation. S100P could regulate endometrial receptivity by expression changes and translocation, S100P may effect fetal-maternal interation by crosstalking with its ligand, ezrin but not RAGE.

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