Virchows Archiv (1994) 424:228

LETTER TO THE EDITORS

Cell adhesion molecules on large granular lymphocytes and endothelial cells in decidua of early human pregnancy

Sirs: We read with great interest the article by Tortosa et al. (1993) concerning the expression of cell adhesion molecules (CAM) by endothelial cells of early human decidua. Using immunohistochemical techniques, these authors found strong expression of ICAM-1, P-selectin and HLA-DR on decidual endothelial cells, whereas staining of these cells for E-selectin, INCAM-110 and VCAM-1 was weak or absent. Tortosa et al. suggest that this differential expression of CAM by decidual endothelial cells may be responsible for the recruitment of the large and unusual population of lymphoid cells found in the decidua, which is composed mainly of CD56++ large granular lymphocytes (LGL) with an NK cell phenotype (representing more than 70% of the intradecidual lymphoid cells) and T cells. However, decidual lymphocytes were not investigated for the expression of counter-receptors for the endothelial CAM in this study. In recent investigations of the distribution of CAM on decidual LGL and endothelial cells we found a similar pattern of immunoreactivity of decidual endothelial cells for ICAM-1, VCAM-1 and E-selectin (Marzusch et al. 1993; Ruck et al., in press). In addition to the immunohistochemical investigations, we also studied the expression of CAM on decidual and peripheral CD56+ lymphocytes by flow cytometry, which revealed that the α-chains of the integrin counter-receptors for both ICAM-1 and VCAM-1 – α_L and α_4, respectively (Springer 1990) – are found on the majority of decidual and peripheral LGL. As the expression of ICAM-1 on decidual endothelial cells is much stronger than that of VCAM-1, we propose that ICAM-1-$\alpha_L\beta_2$ interactions represent the more important mechanism of binding to endothelium in the migration of CD56+ LGL from the peripheral blood into the decidua. This hypothesis is supported by the results of in vitro experiments in which the ICAM-1-$\alpha_L\beta_2$ interaction was identified as the main mechanism in the binding of NK cells to endothelium in the absence of stimulation (Allavena et al. 1992). However, ICAM-1 is also expressed by endothelial cells in other tissues (Dustin et al. 1986), for example the human liver, where it is upregulated in various inflammatory disorders (Volpes et al. 1991) without large numbers of LGL being present in the inflammatory infiltrate. It is therefore probable that there are additional local factors in the decidua that operate to modulate the migration of LGL from the blood and/or stimulate in situ proliferation of these cells.

P. Ruck (✉) · E. Kaiserling · H.-P. Horny
Institute of Pathology, University of Tübingen, Tübingen, Germany

K. Marzusch · J.A. Dietl
Department of Obstetrics and Gynaecology, University of Tübingen, Tübingen, Germany

A. Geiselhart · R. Handgretinger
Department of Paediatrics, University of Tübingen, Tübingen, Germany

G. Vince · C.W.G. Redman
Nuffield Department of Obstetrics and Gynaecology, John Radcliffe Hospital, University of Oxford, Oxford, UK

References

Allavena P, Paganin C, Martin-Padura I, Peri G, Gaboli M, Dejana E, Marchisio PC, Mantovani A (1991) Molecules and structures involved in the adhesion of natural killer cells to vascular endothelium. J Exp Med 173:439–448

Dustin ML, Rothlein R, Bhan AK, Dinarello CA, Springer TA (1986) Induction by IL 1 and interferon-gamma: tissue distribution, biochemistry, and function of a natural adherence molecule (ICAM-1). J Immunol 137:245–254

Marzusch K, Ruck P, Geiselhart A, Handgretinger R, Kaiserling E, Horny H-P, Vince G, Redman CWG (1993) Distribution of cell adhesion molecules on CD56++, CD3−, CD16− large granular lymphocytes and endothelial cells in first-trimester human decidua. Hum Reprod 8:1203–1208

Ruck P, Marzusch K, Kaiserling E, Horny H-P, Dietl J, Geiselhart A, Handgretinger R, Redman CWG (in press) Distribution of cell adhesion molecules in decidua of early human pregnancy: an immunohistochemical study. Lab Invest

Springer TA (1990) Adhesion receptors of the immune system. Nature 346:425–434

Tortosa CG, Vargas ML, Camara M, Aleman P, Montes MJ, Ruiz C, Olivares EG (1993) Expression of adhesion molecules by endothelial cells of early human decidua. Virchows Arch [A] Pathol Anat 434:287–290

Volpes R, van den Oord JJ, Desmet VJ (1991) Lymphocyte trafficking in inflamed liver. APMIS [Suppl] 23:53–67