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Serum soluble vascular cell adhesion molecule-1 (VCAM-1) concentrations in children with reflux nephropathy

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Purpose: Inflammatory systemic disorders with renal tissue damage require the adherence of polymorphonuclear leukocytes to the endothelium, a process that is mediated by cell surface adhesion molecules. We determined the circulating levels of serum vascular cell adhesion molecule-1 (VCAM-1) in vesicoureteric reflux (VUR) patients and investigated the relationship between serum VCAM-1 and grade of VUR and secondary renal scarring.

Methods: Serum levels of VCAM-1 were measured in 53 children aged between 3 months and 15 years with VUR (13 had grade III, 29 had grade IV, and 11 had grade V) and 25 controls using ELISA immunohistochemistry. Radionuclide scanning was used to assess renal scarring.

Results: Renal scarring was found in 29 of the 53 subjects. Serum VCAM-1 was significantly higher ($p < 0.01$) in subjects with high grades of VUR without renal scarring (grade IV: 715.9 ± 121.0ng/mL; grade V: 778.5 ± 33.2ng/mL) compared with subjects with grade III VUR without renal scarring (609.8 ± 64.3ng/mL). Serum VCAM-1 was also significantly higher ($p < 0.001$) in subjects with high grades of VUR with renal scarring (grade IV: 791.2 ± 131.9ng/mL; grade V: 1171.8 ± 235.6ng/mL) compared with subjects with grade III VUR with renal scarring (687.3 ± 163.4ng/mL).

There was no significant difference in serum VCAM-1 levels between subjects with grade III VUR irrespective of scarring and controls (616.0 ± 112.0ng/mL).

Conclusions: These findings suggest that circulating serum VCAM-1 levels reflect increased tissue damage in children with high grade VUR and that VCAM-1 correlates closely with renal scarring. We believe it is a useful marker of disease activity in reflux nephropathy and recommend it be measured routinely.