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9.3 Endothelial progenitor cells and vasculogenic responses to therapy in children with primary systemic vasculitis

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Background

Endothelial progenitor cells (EPCs) are involved in vascular repair. This study describes the relationship between EPCs and growth factors influencing EPC mobilisation from the bone marrow in children with primary systemic vasculitis (PSV).

Materials and methods

20 children (median age 10.6 years (1–16.6); 10 males) with PSV at various stages of disease activity were studied. PSV was classified as: polyarteritis nodosa (n = 10); Wegener's granulomatosis (n = 6); Kawasaki disease (n = 2); Behçet's disease (n = 1) and unclassified (n = 1). EPCs were detected using flow cytometry and defined as cells triple-positive for CD34, CD133, and VEGFR2. Growth factors were measured using ELISA in serum (VEGF) or platelet-poor plasma (Angiopoietin-1, Angiopoietin-2). Disease activity was assessed using a modified BVAS scoring system and evaluation of circulating endothelial cells (CECs) [1].

Results

Peripheral blood EPCs were higher in 12 children with active PSV prior to treatment compared to 20 age-matched child controls ($p = 0.024$). With remission inducing therapy, EPCs declined. Correspondingly VEGF and Angiopoietin-1 and 2 were also significantly elevated at disease onset compared to controls (all $p < 0.03$); VEGF and Angiopoietin-2 declined significantly with treatment (both $p < 0.04$).

Conclusion

Our preliminary observations suggest mobilization of EPCs at the time of maximal endothelial injury, which corresponded with the upregulation of growth factors associated with angiogenesis and vasculogenesis. This observation could thus represent an attempt to repair endothelium in response to vasculitic injury, however the function of EPCs in this context remains poorly defined, and is the subject of ongoing work within our group.

References

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