PATENT FORAMEN OVALE AND HAEMODIALYSIS - IS THERE EVIDENCE OF CEREBRAL MICROEMBOLISATION?

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**Background:** It is known that haemodialysis (HD) creates microemboli that cause pulmonary pathology. A patent foramen ovale (PFO) is particularly important in patients having HD as it allows the potential shunting of material from the right sided venous circulation into the left sided arterial circulation where it may lead to pathology in organs such as the brain.

**Method:** We carried out ultrasound scanning on the arteriovenous fistulae of a sample of patients prior to and during haemodialysis to identify microemboli created by haemodialysis. We then carried out transthoracic echocardiography using bubble contrast to identify PFO in a population of 51 HD patients and in a control population of 29 peritoneal dialysis (PD) patients. We carried out transcranial ultrasound scanning of the middle cerebral artery (MCA) before and during dialysis to look for microemboli in the cerebral circulation.

**Results:** Ultrasound scanning of the drainage arteriovenous fistulae of 8 HD patients revealed significant microembolisation during (31.63 hits over 5 min) compared to after (1.63 hits over 5 minutes) haemodialysis (p = 0.016). Transthoracic echocardiography revealed that 12 out of 51 (23.5%) HD patients and 5 out of 29 (17.2%) PD patients had a PFO. In 39 HD patients, there was no significant difference in the rates of cerebral microembolisation during (0.55 over 5 minutes) or after (0.57 over 5 minutes) haemodialysis (p = 0.915). There was no significant difference in the rates of cerebral microembolisation during haemodialysis in HD patients with or without a PFO (p = 0.385). There was also no significant difference in the rates of cerebral microembolisation between HD and PD patients during dialysis (p = 0.986).

**Conclusions:** We confirmed the results of previous studies that HD creates microemboli detectable by ultrasound in the drainage arteriovenous fistulae. However we found no evidence of cerebral microembolisation in the MCA during HD. There was also no difference in rates of microembolisation between PD and HD patients and between patients with and without a PFO. This is intriguing as other groups have published reports of microemboli detectable in the carotid arteries during haemodialysis.