

macrophage infiltration ($P < 0.01$ vs vehicle) and α -smooth muscle actin expression ($P < 0.01$ vs vehicle). Gelatin zymography revealed that MMP-2 levels were significantly increased with combination therapy ($P < 0.01$ vs. vehicle, $P < 0.05$ vs. MSC or serelaxin alone). *In vivo* tracing studies showed MSCs homed to the UUO-injured kidney within 1 hour post transplantation where they remained for 36 h. Serelaxin also significantly increased MSC proliferation *in vitro* (-14% ; $P < 0.05$).

Conclusions: This study is the first demonstrate that when used in combination, MSCs and the antifibrotic serelaxin, ameliorate pathological fibrosis and improve MSC-mediated repair, in part, via through the up-regulation of MMP-2.

008

LEAD TIME BIAS IN PRE-EMPTIVE LIVING KIDNEY DONOR TRANSPLANTATION

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Aim: To explore the impact of lead time bias in survival comparisons of pre-emptive vs non pre-emptive living donor kidney transplants.

Background: Pre-emptive and non pre-emptive living kidney donor transplants have similar post-transplant patient survival. However, pre-emptive transplants occur earlier in a patient's disease course and this "lead time" may bias survival comparisons.

Methods: Using the Australia and New Zealand Dialysis and Transplant (ANZDATA) Registry, we included adult living donor kidney recipients over 1993–2012 who were transplanted pre-emptively ($n = 1237$) or after up to 6 months of dialysis (controls, $n = 3375$). Patients were matched 1:1 by propensity score. Two sources of lead time were added to post-transplant survival times: (1) Dialysis lead time (pre-transplant dialysis duration) and (2) CKD lead time (estimated as the difference in eGFR at commencement of renal replacement therapy (RRT) divided by the assumed rate of CKD progression, with different assumed rates modelled). Survival of pre-emptive and control patients was compared using Cox models.

Results: Pre-emptive recipients were more commonly Caucasian, commenced RRT with higher eGFR (median 9.2 vs 6.3 mL/min/1.73 m²) and had fewer co-morbidities. Before matching, pre-emptive transplantation was strongly protective (HR 0.50, 95%CI: 0.39–0.65). After matching there were 539 patients included in each group, and the protective effect was no longer evident (HR 1.17, 95%CI: 0.73–1.87). Adjusting for lead time bias enhanced survival of controls over pre-emptives, although survival was not statistically different across a clinically relevant range of eGFR decline rates.

Conclusions: Adjustment for lead time bias neutralises the apparent survival advantage of pre-emptive living donor transplantation. Further studies with larger numbers are needed to confirm this observation.

009

BASELINE CHARACTERISTICS OF THE PATIENTS PARTICIPATING IN THE FAVOURED TRIAL

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Aim: To present the baseline characteristics of the FAVOURED Trial participants.

Background: The FAVOURED Study is an international randomised, double-blind placebo controlled factorial trial examining whether the use of aspirin and omega-3 fatty acids (fish oil), either alone or in combination, reduces the risk of early failure of de novo arteriovenous (AV) fistula.

Methods: Demographic and clinical features of 568 participants enrolled at 35 sites in Australia, New Zealand, Malaysia and United Kingdom are presented.

Results: 403 participants from Australia and New Zealand (ANZ), 156 from Malaysia and 9 from United Kingdom. Mean age was 54.8 ± 14.3 , 63.5% were males, 52.8% Caucasian and 32.1% Asian. Diabetes was the commonest cause (62.1% in Malaysia and 29.9% in ANZ) although both regions had low prevalence of ischaemic heart disease (4.5% Malaysia vs 8.2% ANZ). Site of the planned fistula differed with 51.9% Malaysian patients having upper-arm AVF compared with 34% in ANZ ($P < 0.0001$). 60.8% of Malaysians were receiving dialysis (all haemodialysis) compared with 47.4% in ANZ (35.7% utilising HD and the remaining 11.7% with functioning transplant or on PD); $P = 0.005$. Type of access also differed between regions with 89.2% in Malaysia using non-cuffed

catheters and 88.6% of ANZ patients using cuffed catheters. Malaysian patients were relatively more anaemic (Hb 92 vs 112 gm/L; $P < 0.0001$).

Conclusions: A number of regional differences in demographic and clinical characteristics were identified. The FAVOURED trial demonstrates the benefits of multinational collaboration: enabling more effective recruitment and ensuring inclusiveness and diversity of the study subjects resulting in better generalisability of the trial results.

010

ANYTHING BUT A SIMPLE SURGICAL PROCEDURE: PATIENTS' PERSPECTIVES OF VASCULAR ACCESS FOR HAEMODIALYSIS

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Aim: To describe patients' perspectives on vascular access initiation and maintenance in haemodialysis.

Background: Delayed creation of vascular access is associated with adverse outcomes and may be partly due to patient refusal. Concerns about vascular access are prevailing treatment-related stressors for patients on haemodialysis.

Methods: MEDLINE, Embase, PsycINFO, CINAHL, reference lists, PhD dissertations were searched to December 2013. Qualitative studies that assessed the attitudes and experiences of patients with chronic kidney disease (CKD) on vascular access were synthesized thematically.

Results: Forty-six studies involving 1034 patients (haemodialysis [$n \geq 761$]; peritoneal dialysis [$n \geq 67$]; non-dialysis dependent [$n \geq 42$]; unspecified modality [$n \geq 164$]) were included. Six themes were identified: heightened vulnerability (bodily intrusion, cannulation fears, threat of complications, unpreparedness, dependence on a lifeline, wary of unfamiliar providers); disfigurement (preserving appearance, visual reminder of disease, avoiding stigma); bodily mechanisation (bonded to a machine, internal abnormality, constant maintenance); impinging on way of life (physical incapacitation, instigating family tension, wasting time, added expense); self-preservation and ownership (task-focussed control, advocating for protection, acceptance) and confronting decisions and consequences (imminent dialysis, existential thoughts). Apparent differences across access types were primarily related to complications; clotting, infiltration and stenosis were emphasized with fistula and graft use, whereas infections were a predominant concern in catheter use.

Conclusions: Vascular access is more than a surgical intervention; it signifies imminent dialysis, which is emotionally confronting. Patients strive to preserve their access for survival; but simultaneously describe it as an agonizing reminder of their body's failings and "abnormality" of being amalgamated with a machine, disrupting their identity and lifestyle. Timely education and counselling and building patients' trust in providers may improve the quality of dialysis and lead to better outcomes for patients on haemodialysis.

011

INDICATIONS FOR FISTULOGRAPHY AND CORRELATION WITH DETECTION OF ARTERIOVENOUS FISTULA STENOSIS

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Aims: To identify the indications for fistulograms and determine correlation between indication and radiological findings.

Background: Dialysis access stenosis is the most common cause of access dysfunction. Clinical monitoring or vascular access surveillance abnormalities prompt a fistulogram. At our institution, fistulogram is primarily used to confirm stenosis.

Methods: A retrospective observational study was conducted on 245 fistulograms performed at our institution over a two year period from January 2012 to December 2013. The indication for referral, fistulogram findings, type of fistula and demographic data were obtained.

Results: Total of 75.5% (185 of 245) fistulograms performed confirmed stenosis. The most frequent clinical indication was high venous pressures – 18.4% (45 of 245) and the most common surveillance indication was abnormal access flow (Transonic®) – 17.1% (42 of 245).

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The average age was 57 years, with 35.9% Aboriginal and 28.2% Torres Straight Islander ethnicity. The most common type of vascular access was radiocephalic fistula (49.8%) followed by brachiocephalic fistula (43.3%).

Further analysis of variables, using bivariate logistic regression analysis, failed to reveal any significant correlation between indications for referral and finding of stenosis. However, increased venous pressure tends to be associated with stenosis (Odds ratio 2.0, 95% CI = 0.84–4.7, $P = 0.12$).

Both venous hypertension (Odds ratio 0.10, 95% CI = 0.011–1.0, $P = 0.052$) and development of collaterals (Odds ratio 0.077, 95% CI = 0.0084–0.70, $P = 0.023$) were associated with negative fistulograms.

Conclusions: At our institution, the majority of fistulograms demonstrated access stenosis, based on established referral indications. Both venous hypertension and development of collaterals as referral indications were associated with less likelihood of finding vascular access stenosis in this cohort.

INITIAL EVALUATION OF PLASTIC HAEMODIALYSIS CANNULAE IN AN AUSTRALIAN CENTRE

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012

Aim: To describe an initial experience using plastic haemodialysis cannulae (PHC) in difficult access situations.

Background: PHC have been used internationally for haemodialysis access and may offer the advantage of lower profile for gauge, length for deeper fistulae, and less chance of trauma/migration with arm movement. Our unit has used PHC particularly in difficult cannulation situations.

Methods: Standard dialysis practice data about PHC (Argyle®, Covidien) were gained prospectively during a single centre evaluation period between first use in October 2013 and March 2014. Complications, effective blood flow rates, maximum arterial and venous pressures, cannula gauge, use of ultrasound, and comments by the inserting nurses were described.

Results: 226 plastic cannulae were inserted into 23 patients over 107 dialysis sessions by 7 dialysis nurses. Indication for the majority was deep fistula, known difficult cannulation, or preceding haematoma formation limiting accessible sites. Difficulty related to patient issues was reflected in ultrasound use in 83% (187/226). Effective blood flows ≥ 300 mL/min were achieved in 87% (72 of 83 sessions). The remainder achieved between 230 and 280 mL/min. Median (and range) of arterial and venous pressures were 140 (40–200) and 130 (100–200) mmHg respectively. In the majority of instances 15G cannulae were used (218/226). 24 attempts failed due to PHC technique failure, of which two resulted in infiltration.

Conclusion: Plastic haemodialysis cannulae can facilitate satisfactory performance of dialysis achieving desirable flow parameters especially in those patients with difficult access. Comparative, prospective studies are required to determine equivalence/superiority and address longer term access patency.

013

PRACTICE CHANGES DECREASE BUTTONHOLE INFECTION RATES IN HOME HAEMODIALYSIS PATIENTS

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Aim: To describe infection rates of buttonhole cannulation (BHC) related to changes in hygiene practices in home haemodialysis patients (HHD).

Background: Buttonhole cannulation has been associated with greater rates of infection compared to standard cannulation of arteriovenous fistulae (AVF), although not all studies confirm this finding. We report infection rates of buttonhole cannulation of AVF in HHD over 10 years, before and after changes in practice of skin preparation procedure and the use of topical mupirocin prophylaxis (TMP).

Methods: We observed 169 patients (pts) using native AVF with BHC and compared the infection events rates, with a cumulative treatment duration of 189,720 AVF-days, between 2004 and 2013 in three different stages; 1) 108 pts with pre-new BHC technique procedures (BHCTP) for 100,530 AVF-days – Stage 1, and 2) 66 pts with new BHCTP for 25,050 AVF-days – Stage 2, and 3) 99 pts with post-new BHCTP with TMP for 64,140 AVF-days – Stage 3.

Results: A total of 45 BH infection episodes (systemic – 23 episodes, local – 22 episodes) were identified, giving a cumulative infection rate of 0.236/1000 AVF-days. The comparison of infection rates in the three different stages was: Stage 1 – 0.358 events/1000 AVF-days (0.25–0.50) with 36 infection episodes (systemic 19, local 17), Stage 2 – 0.319 events/1000 AVF-days (0.14–0.63) with 8 infection episodes (systemic 4, local 4), Stage 3 – 0.016 events/1000 AVF-days (0.00–0.09) infection episode (1 local). There was a significant difference between Stage 3 and Stage 1 and 2 ($P < 0.0001$).

Conclusion: Infection rates in buttonhole cannulation can be decreased with strict hygiene procedures and TMP. TMP use was associated with significantly lower risk of infection and should be considered in any patient using BHC.

014

DEATH DUE TO HAEMODIALYSIS VASCULAR ACCESS HAEMORRHAGE

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Aim: To identify, quantify and collate deaths due to bleeding from haemodialysis vascular access.

Background: Haemodialysis requires access to the circulation via either a synthetic vascular catheter or an arteriovenous fistula or graft. To prevent clotting, regular anticoagulation (most commonly heparins) is given. Whilst not common, anecdotally there have been a number of dialysis patients dying due to a significant bleed from their dialysis access.

Methods: A retrospective review of ANZDATA from 1964 to 31/12/2012, for all persons dying where cause of death was recorded as death due to dialysis access haemorrhage. Further information was requested from the treating units about these specific deaths.

Results: Recorded on ANZDATA, 90 people (57 female) receiving renal replacement therapy died due to dialysis access haemorrhage, including 55 since 1/1/2000. Mean age was 63.7 years (range 17–87 years). Modality at the time of death included 42 (47%) on Hospital HD, 27 (30%) on Satellite HD, 19 (21%) on Home HD, 2 (2.2%) on Peritoneal dialysis, but none with a functioning transplant. Comorbidities included diabetes in 37%, coronary disease in 56% and 13% were current smokers. Prior to death recorded pathology included mean Hb 110 ± 19 g/dL (range 70–169 g/L) and 88.7% were on an ESA. Access in use at the time of death included native fistula 53%, synthetic graft 30%, tunnelled catheter 11%, and temporary catheter 6%.

Conclusions: Death due to dialysis access haemorrhage is a rare but potentially preventable adverse event.

015

CHANGES IN CARDIAC INDICES AFTER A-V FISTULA LIGATION OR THROMBOSIS IN STABLE RENAL TRANSPLANT PATIENTS

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Background: An arterio-venous fistula (AVF) increases stroke volume and cardiac output and can lead to high output cardiac failure. It may also contribute to left ventricular hypertrophy (LVH) in renal failure patients. Following renal transplant, cardiac parameters often improve in dialysis patients, but the presence of a functioning, high-flow AVF may impair full recovery of cardiac abnormalities.

Aim: To measure the changes in cardiac parameters and function induced by elective AVF ligation or spontaneous thrombosis in stable renal transplant patients. AVF were ligated for cosmetic reasons or due to chronic pain.

Methods: Nine patients were eligible for inclusion during the study period. A transthoracic echocardiogram was performed on all patients prior to ligation or thrombosis of their AVF and 3 months following occlusion. Parameters measured included stroke volume, heart rate, cardiac output, left ventricular (LV) ejection fraction, LV mass index and wall thickness.

Results: There was a significant fall in mean heart rate (78 vs. 66 bpm, $P = 0.04$), stroke volume (91 vs. 76 mL, $P = 0.039$), cardiac output (7.1 vs. 4.7 L/min, $P = 0.002$) and cardiac index (3.9 vs. 2.5 L/min/m² BSA, $P = 0.002$) post AVF ligation. Mean LV ejection fraction increased and LV mass index was lower post fistula ligation although the results did not reach statistical significance. There was no significant change in LVH.