5A VASCULAR 2
Thursday 8th January 2015, 12.00-13.30
12 papers (5 min + 2 min)

O156 A UK PERSPECTIVE OF VOLUME – OUTCOMES RELATIONSHIP IN ACUTE AORTIC DISSECTION UTILIZING NATIONAL INSTITUTE FOR CARDIOVASCULAR OUTCOMES RESEARCH (NICOR) DATA

M Bashir, M Shaw, G Hickey, S Grant, M Fok, M Kuduvalli, M Field, A Oo
Thoracic Aortic Aneurysm Service, Liverpool Heart and Chest Hospital

Introduction: Acute Type A aortic dissection (ATAD) is a lethal condition with dire prognosis. In other surgical disciplines outcomes are related to volume of activity by surgeon and hospital. This study was conducted to determine whether a volume-outcome relationship (V-OR) exists for ATAD in the UK.
Method: Between 2007 – 2012, 1340 ATAD were identified from the NICOR database. 42 institutions from the UK recorded one or more ATAD in their surgical activity. We analysed the in-hospital mortality and assessed the V-OR per surgeon and overall centre activity for ATAD.
Result: The number of procedures per centre during the 5 year period ranged from 1 to 87. Overall, in-hospital mortality rate was 19.3% (258/1340). An inverse relationship was observed between operative mortality and surgeon volume: surgeons who performed fewer than 10 aortic dissection repairs over the five year period had a mean operative mortality of 21.8%, compared to 16.0% for those performing 10 or more (p=0.007). This was similar to the relationship seen between centre volume and mortality: operative mortality was 23.5% in centres performing fewer than 25 ATAD over the five year period, compared with 18.6% in those performing 25 or more (p=0.11).
Conclusion: Open ATAD repair mortality appears to be dependent on the area of care and surgeon's volume activity. ATAD repair should be centralised to hospitals and surgeons with high volume.
Take-home message:
Open Acute Type A Aortic Dissection repair mortality appears to be dependent on the area of care and surgeon's volume activity. Acute Type A Aortic dissection repair should be centralised to hospitals and surgeons with high volume.

O157 POTENTIAL CLINICAL APPLICATIONS OF ELECTRICAL MUSCLE STIMULATION IN VENOUS DISEASE

R Ravikumar, KJ Williams, AH Davies
Academic Section of Vascular Surgery, Imperial College London

Introduction: Venous return to the heart is dependent on a pressure gradient, competent venous valves, and an effective muscular pump. Electrical impulses can cause muscle contraction via direct (muscle) or indirect (nerve) stimulation. This systematic review examines the evidence for the use of electrical stimulation in treating venous disease.
Method: The MEDLINE and Embase databases were searched to identify all articles relating to application of electrical muscle stimulation in treating venous disease. English language and human limitations were applied.
Result: Forty-six studies met the inclusion criteria. Results are presented in terms of effect on venous haemodynamics, reduction of oedema and thromboprophylaxis. All studies (n=11) showed that electrical stimulation improved venous haemodynamics. Variations in electrical parameters affect blood flow. A longer pulse duration (300μs) and higher frequency (35Hz) produced a higher peak venous velocity. However, extremes of stimulation frequencies can impair ejected venous volume. Voluntary contraction is superior to electrical stimulation at improving blood flow. Electrical stimulation produces comparable venous haemodynamics to intermittent pneumatic compression. One of three recent studies reported mixed results on the use of electrical stimulation in thromboprophylaxis. Five trials examined the effect of electrical stimulations on oedema; four of which showed improvements.
Conclusion: The positive effect of electrical stimulation on venous haemodynamics has not translated into clinical practice. A consensus needs to be reached on reporting nomenclature to allow comparison between trials. More research needs conducted on the short (thromboprophylaxis) and long term (venous disease) therapeutic effects of electrical stimulation.
Take-home message:
Electrical stimulation is a re-emerging science which has potential use in venous

thromboprophylaxis and treatment of venous disease. Clinical trials should investigate its use in clinical practice.

O158 OPPORTUNITY FOR CARDIOVASCULAR RISK FACTOR REDUCTION IN AAA SURVEILLANCE PROGRAMS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF CARDIOVASCULAR MORTALITY IN PATIENTS WITH SMALL AAA

MF Bath, VJ Gokani, DA Sidloff, LR Jones, E Choke, RD Sayers, MJ Bown
University of Leicester

Introduction: Screening for abdominal aortic aneurysm (AAA) has dramatically reduced the rate of AAA-rupture, yet cardiovascular mortality is still a major cause of death in this patient group; a diagnosis of AAA is a powerful marker of cardiovascular risk. The aim of this study was to assess the cardiovascular risk in small AAA patients.
Method: Standard PRISMA guidelines were followed. A meta-regression analysis was performed for cardiovascular mortality in small AAA patients and a qualitative synthesis of the prevalence of concurrent cardiovascular diseases.
Result: A total of 10 studies comprising 2323 patients were identified from the search on cardiovascular mortality in small AAA patients (median follow-up 5 years). A total of 335 cardiovascular deaths occurred, 37 of which were due to AAA-rupture, showing a cardiovascular mortality risk of 3.00% per year in small AAA patients ($R^2=0.902$, $p<0.001$). The prevalence of ischaemic heart disease (44.9%), myocardial infarction (26.8%), heart failure (4.4%) and cerebrovascular disease (14.0%) was significantly higher in patients with small AAA than in the general population.
Conclusion: There is a high cardiovascular risk in patients with small AAA, yet many may not be taking advantage of optimal cardiovascular risk factor modification. The diagnosis of a small AAA should be seen as a red-flag sign, triggering lifestyle change and pharmaco-vigilance against cardiovascular risk factors.
Take-home message:
Small AAA patients have a high risk of cardiovascular mortality

O159 AVAILABILITY OF SUPERVISED EXERCISE PROGRAMMES FOR PATIENTS WITH PERIPHERAL ARTERIAL DISEASE

A Babber, L Dsa, Y Ge, AH Davies
Imperial College, London

Introduction: Referral to supervised exercise programmes (SEPs) for patients with Intermittent Claudication (IC) is recommended by TASC II, NICE and SIGN guidelines. This management strategy seems underutilised. The aim of this national study was to evaluate the availability, compliance, and obstacles preventing access to SEPs.
Method: A 19-question survey was developed by literature review, structured patient interview and specialist consultation, before disseminating by email using the surveymonkey.com platform.
Result: The majority of NHS trusts were represented with 118 respondents comprising 88 consultant vascular surgeons, 23 physiotherapists, 6 trainee surgeons and a vascular physician. Only 35% (41) respondents had access to a SEP in their region, with 55% (64) having no direct access and 10% (12) having previous access to a now closed programme. Funding (88%), staff (45%) and appropriate facility resources (25%) were major obstacles cited as the lack of SEP availability. Of those with SEP access, 56% had one SEP per week, 24% offered 2 and 10% offered 3. The majority were 1 hour sessions (66%) with 17% over 1 hour and 12% less than 30 minutes. The duration varied with 37% running SEPs for 3 months, 27% for less than 3 months and 17% for 6 months.
Conclusion: The majority of respondents (93%) believe in the benefit of SEPs, however, many IC patients have no access. Where access does exist, there is marked heterogeneity of frequency and duration. This survey highlights important inequities and that despite NICE guidance patients are not receiving best evidence based treatment.
Take-home message:
Supervised Exercise Programmes are recommended by national and international guidelines for all patients suffering peripheral arterial disease. However, there is a national lack of availability and access to SEPs.

O160 AN INTERNATIONAL, MULTICENTER, RANDOMIZED, SINGLE-BLIND, CONTROLLED TRIAL OF A DRY POWDER, FIBRIN SEALANT TO STOP SURGICAL BLEEDING IN PATIENTS UNDERGOING VASCULAR SURGICAL PROCEDURES

I Chetter (1), N Gupta (2), P Hayes (3), A 0-Yurvati (4), G Moneta (5), S Shenoy (6), LA Zuckerman (7)
(1) University of Hull, East Yorkshire, United Kingdom; (2) North Shore University Health System, Skokie, IL, USA; (3) Addenbrookes Hospital, Cambridge, England; (4) University of North Texas Health Science Center, Fort Worth, TX, USA; (5) Oregon Health and Science University, Portland, OR, USA; (6) Washington University, St. Louis, MO, USA; (7) The Medicines Company, Seattle, WA, USA

Introduction: Topical hemostats are important adjuncts for stopping surgical bleeding. This study evaluated the safety and efficacy of a ready to use, dry powder, fibrin sealant containing human plasma-derived thrombin and fibrinogen in reducing TTH in patients undergoing vascular procedures.
Method: This study was a randomized, controlled trial (clinicaltrials.gov: NCT01527357) comparing fibrin sealant plus gelatin sponge vs. gelatin sponge alone in patients undergoing vascular surgery with suture hole bleeding. Adult patients were randomized 2:1 to fibrin sealant or gelatin sponge and the primary efficacy endpoint was a comparison of the TTH time to event curves over 5 minutes. Subjects were followed for 28 days for safety.
Result: 175 patients were treated (fibrin sealant: 117; gelatin sponge: 58). Patients were predominately male (69%) and underwent arterial bypass (81%), arteriovenous graft formation (9%), or carotid endarterectomy (9%). Fibrin sealant significantly reduced TTH compared to gelatin sponge as determined by the hazard ratio (2.13, 95% CI 1.46-3.10). Significant reductions were also observed in the subset of patients who were treated with both anticoagulant and antiplatelet agents (hazard ratio 2.29, 95% CI 1.21-4.33). The most common adverse events were procedural pain, nausea, and constipation and were generally similar between treatment groups. Non-neutralizing, anti-thrombin antibodies developed in 2% of fibrin sealant-treated patients.
Conclusion: A ready to use, dry powder fibrin sealant was well tolerated and reduced TTH in patients undergoing vascular procedures, including those receiving anticoagulant and antiplatelet agents, demonstrating its safety and usefulness as an adjunct to hemostasis. TTH=time to hemostasis
Take-home message:
A ready to use, dry powder fibrin sealant was well tolerated and reduced time to hemostasis in patients undergoing vascular procedures, including those receiving anticoagulant and antiplatelet agents, demonstrating its safety and usefulness as an adjunct to hemostasis.

O161 WITHDRAWN

O162 OBJECTIVE CT-BASED LOWER LIMB ARTERIAL CALCIFICATION (LLAC) ASSESSMENT: PROOF OF CONCEPT AND CORRELATION WITH ATHEROSCLEROTIC DISEASE BURDEN

MM Chowdhury, GC Makris, MS Gohel, JR Boyle, PD Hayes, K Varty, PA Coughlin
Department of Vascular Surgery, Addenbrookes Hospital

Introduction: Arterial calcification is increasingly recognized as a risk for poor outcome specifically within the coronary circulation. Limited data is available regarding the objective assessment of LLAC using similar analysis with no correlation with atherosclerotic disease burden.
Method : The LLAC scores from 117 patients (80 men; mean age 71.1 years) undergoing CT lower limb angiography were determined using a modified Agatston method. Segmental divisions of lower limb arteries into aorto-iliac (AI), femoro-popliteal (FP) and crural regions underwent calcium scoring, validated Bollinger scoring and formal TASC II lesion assessment. Intra- and inter-reliability assessment was performed.
Result: Reliability analysis showed outstanding intra- and inter-reader reliability of the LLC score (intra =0.978; inter =0.998). LLAC scores had a significant correlation with the need for endoluminalintervention (1.002 (1.001-1.003), P <0.0001, R2 = 0.709). Angioplasty was carried out in 51 patients, with a strong positive correlation between calcium score and Bollinger score in the region of intervention (P=0.023). Total LLAC score correlated with total Bollinger score (P<0.0001). Segmental analysis confirmed a positive relationship in the AI, FP and crural segments between LLAC and atherosclerosis burden (Bollinger / TASC C&D). Patients with critical limb ischaemia (compared to claudication) had higher LLAC score within the AI and FP segments.
Conclusion: Determination of LLC using an Agatston method is straightforward to perform, reproducible and correlates with atherosclerotic disease burden. Further studies are required to determine the role of LLC as a potential precursor to atherosclerosis and as a potential marker of both overall and limb specific outcomes.

Take-home message:
Role of lower limb calcification scoring may predict treatment outcomes in patients with peripheral vascular disease.

O163 HYDROGEN SULPHIDE REDUCES REMOTE RENAL INJURY AND INFLAMMATION FOLLOWING ABDOMINAL AORTIC OCCLUSION IN RATS

JP Hunter, SA Hosgood, M Patel, P Furness, RD Sayers and ML Nicholson
University of Leicester

Introduction: Remote renal ischaemia-reperfusion injury (IRI) following infra-renal aortic occlusion may result in acute kidney injury and systemic inflammation. Hydrogen sulphide (H2S) is a mediator of IRI and can reduce injury and inflammation. Its role in vascular surgery has yet to be established. We assessed the role of hydrogen sulphide in a rodent model of aortic occlusion.
Method: Wistar rats were divided into sham, control and treatment groups (n=6). Inflammation was assessed using a non-recovery protocol. The infra-renal aorta was occluded for 60 minutes and animals were reperfused for 120minutes. Ten minutes prior to clamp release treatment animals received hydrogen sulphide (10µg/kg, 30µg/kg or 50µg/kg) and control animals received 0.9% saline, injected into the retroperitoneum. Renal injury and histology was assessed using a recovery protocol. The procedure was identical to the non-recovery arm but with a single dose of hydrogen sulphide (30µg/kg) and animals were recovered for 7 days.
Result: There was no difference in animal weight between the groups (P=0.337). Treatment animals in the non-recovery arm demonstrated a reduction in serum levels of TNFα compared with controls (909±98 versus 607±159pg/ml; P=0.0038). There was also a reduction in MPO positive cells in renal tissue in H2S treated animals compared with controls (8±4 vs. 17±9; P=0.03). There was no difference in histological injury score or Endothelin-1 levels. In the recovery arm there was no difference in renal function, KIM-1 levels or histological injury scores.
Conclusion: Hydrogen sulphide has systemic and renal anti-inflammatory effects following infra-renal aortic occlusion in rats.
Take-home message:
Hydrogen sulphide has the potential to reduce ischaemia-reperfusion injury and remote renal injury following aortic occlusion.

O164 WITHDRAWN

O165 COMPARATIVE ACCURACY AND RELIABILITY OF 3D CAMERAS IN SIMULATED WOUND MEASUREMENT

KJ Williams, AH Davies
Imperial College London

Introduction: Clinical management of wounds can benefit from objective measures of response to treatment. Wound volume is an important marker of diabetic foot ulcer healing. Using a synthetic wound model we compare the accuracy and reproducibility of two commercially available 3D cameras against water displacement and manual planimetry.
Method: Twelve ulcers of various sizes were reproduced in modelling clay and cured. 5 naiive observers used digital plainimetry, water displacement, Eykona camera (Fuel 3D, UK), and Silhouette camera (ARANZ, New Zealand) to measure the wounds.
Result: Wound surface area comparison of traditional planimetry to Eykona and Silhouette resulted in a bias of 0.5cm2 and 0.7cm2 respectively, errors bigger when measuring larger wounds, and an ICC of 1 for all three. Water displacement measurement of ulcer volume compared to Eykona and Silhouette resulted in a bias of 0.7ml and 0.3ml, with an ICC of 1, 1, and 0.96 respectively.
Conclusion: Serial accurate objective area measurements are feasible as part of on-going clinical assessment of wounds. However, replacing manual planimetry with three-dimensional measurements is unlikely to result in improvements in wound measurement accuracy. The added dimension that these cameras bring is sensitivity, through the ability to take volume measurements. This may better reflect the progress of underlying process of healing.
Take-home message:
Manual planimetry is accurate for measuring wound surface area. 3D cameras allow easy measurement of wound volume, which may be more sensitive than measuring wound surface area.

O166 UNDERSTANDING PATIENT ACCEPTANCE OF RISK WITH TREATMENT OPTIONS FOR INTERMITTENT CLAUDICATION

AHM Morbi, M Albayati, S Coles, IM Nordon, CP Shearman
Department of Vascular Surgery, University Hospital Southampton NHS Foundation Trust

Introduction: Intermittent claudication (IC) has a major impact on quality of life. Management is largely influenced by vascular surgeons' perceptions of risk, with little information available regarding the level of risk that patients perceive to be acceptable.
Method: Patient with confirmed IC presenting to vascular clinic and supervised exercise classes were surveyed in a single-centre prospective study. A standard gamble-type method was used to measure patients' acceptance of risk associated with medical treatment, angioplasty and surgical bypass. Level of risk acceptance was correlated to patient factors.
Result: 50 patients were surveyed; 74% male; median age 68-years (IQR 59-74), pain-free walking distance 100m (70-200) and ankle-brachial pressure index 0.65 (0.60-0.78). Median risk-acceptance for treatment-failure was 70% for medical treatment, 50% for angioplasty and 40% for surgical-bypass. Median risk-acceptance for major amputation and death was 0% for all 3 management options. Claudicants with pain-free walking distance <100m accepted higher risk of treatment-failure ($p=0.0005$ for medical treatment, $p=0.0038$ for angioplasty), and death with medical treatment ($p=0.0009$). There was no significance between claudication-distance and risk-acceptance of major amputation with any treatment modality or death with angioplasty or surgical-bypass. Levels of risk-acceptance between angioplasty and surgery were not significant (risk of death $p=0.89$, amputation $p=1.00$).
Conclusion: Claudicants are prepared to accept significant risk of treatment failure, in order to gain benefit, but regardless of claudication distance, patients had low acceptance of risk of amputation or death. Surgical-bypass appears equally acceptable to patients as angioplasty. Patient acceptance of risk should be considered when planning management.
Take-home message:
Claudicants are prepared to accept significant risk of treatment failure, in order to gain benefit, particularly if they have <100m claudication-distance prior to treatment. Patient acceptance of risk should be considered when planning management.

O167 A RANDOMIZED CONTROLLED STUDY INVESTIGATING THE BEST WAY TO PREVENT RENAL DAMAGE IN ENDOVASCULAR ANEURYSM REPAIR

A Saratzis (1,2), M Saedon (2), T Saran (2), M Patteril (2), M Bown (1), A Mahmood (2)
(1) Department of Cardiovascular Sciences, University of Leicester; (2) University Hospital Coventry and Warwickshire

Introduction: Acute Kidney Injury (AKI) impacts on mortality, morbidity and cost. The incidence after elective endovascular aneurysm-repair (EVAR) can be as high as 18% and that impacts on short and longer-term outcome; however, there is no randomized evidence regarding prevention-strategies. The main aim of this study is to assess aggressive intravenous hydration with or without a bicarbonate load as means of preventing AKI in EVAR. Study-Design: Prospective randomized controlled study. Patients undergoing elective EVAR will be randomized to receive aggressive-hydration prior to induction with or without a bolus of bicarbonate. Serum creatinine (SCr) will be measured before, 24, and 48 hours after EVAR, together with urine-output and 5 different sensitive biochemical markers of kidney-damage (every 6 hours). Primary endpoint is incidence of AKI as per the latest NICE-guidance (2013); secondary endpoints include change in the urinary-markers and association of AKI with complications. Pilot-Data: A prospective pilot-study including 149 elective EVARs disclosed that using contemporary AKI-definitions, overall incidence is 18.8% and AKI impacts on outcome. Patient-public involvement also revealed that patients are significantly concerned about the effect of EVAR on renal-function. A nationwide survey among vascular-anaesthetists showed that practices vary significantly regarding type of hydration and prevention strategies and randomized-evidence is urgently required. Preliminary work also showed that the proposed hydration regime is safe and efficient. Forward-plan: Randomization will be completed within 2 years (212 recruits).
Result will help improve EVAR safety and outcome, both short and long-term. Quantitative and qualitative analyses and basic-science side-projects will shed light into EVAR-related AKI, in this 1st adequately-powered trial investigating renal-damage in EVAR.