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Abstracts of the East of England Undergraduate Cardiology Conference 2025

CytoSorb Beads Effectively Reverse the Antiplatelet Effects of Ticagrelor *In Vitro*

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Background: Major perioperative bleeding is a significant concern in coronary artery bypass grafting patients on Ticagrelor, with a 16% risk when Ticagrelor is discontinued 0–2 days before surgery and 2.7% if discontinued 3 days prior. Ticagrelor, a reversible P2Y₁₂ receptor inhibitor, blocks ADP-induced platelet activation and aggregation, and rapid reversal of Ticagrelor's anti-platelet effects is crucial in emergency surgeries. This study investigates the use of Cytosorb beads in haemadsorption to remove ticagrelor, enabling ADP binding and platelet aggregation. Unlike prior studies measuring blood Ticagrelor levels after incubation with beads, we focus on its dissociation from P2Y₁₂ receptors using in vitro models.

Methods: Venous blood (36 ml) was collected from healthy volunteers and acute coronary syndrome patients. Samples were treated with 1 µmol/L Ticagrelor, and Cytosorb beads were added at intervals (0, 15, 30, 45, and 60 minutes). Platelet aggregation was measured using whole blood single platelet count (WBSPC) and light transmittance aggregometry (LTA). WBSPC quantified aggregation induced by 3 µmol/L ADP, activating P2Y₁ and P2Y₁₂ receptors, leading to platelet shape change and aggregation. LTA measured aggregation in platelet-rich plasma exposed to 5 and 20 µmol/L ADP, with Cytosorb beads tested at varying concentrations and incubation times.

Results: WBSPC showed significant differences in platelet aggregation. In samples treated with Ticagrelor and immediate Cytosorb bead addition (Figures 2 and 3), mean aggregation was 60.6%, compared to 30.3% without beads ($p < 0.01$). A 60-minute bead incubation yielded 57.4%, not significantly different from the 32.8% seen with Ticagrelor alone ($p = 0.12$), suggesting prolonged exposure does not enhance reversal, aligning with saturation kinetics models. LTA (Figure 1) and VerifyNow assays (Figure 4) confirmed these findings. Ticagrelor (100 nmol/L) reduced PRU to 92 ($p < 0.01$ vs. DMSO control). After 60 minutes of bead incubation, PRU increased to 146 ($p < 0.05$), showing partial reversal (Figure 1). Beads added for 15 (PRU = 169), 30 (PRU = 168), and 45 minutes (PRU = 183) ($p < 0.05$) produced similar reversals, with 45 minutes optimizing Ticagrelor dissociation from P2Y₁₂ receptors. WBSPC underscored Cytosorb's rapid action.

Conclusion: Cytosorb beads effectively reverse Ticagrelor-induced platelet inhibition in vitro, with 45-minute incubation providing optimal results. This rapid reversal, supported by WBSPC, LTA, and VerifyNow, suggests that Cytosorb beads could improve treatment protocols for urgent surgeries by quickly restoring platelet function, enhancing safety.

Audit on Use of Statins for Secondary Prevention of Cardiovascular Disease Via Lipid Management

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ABSTRACT

Introduction: Cardiovascular disease (CVD) is the leading global cause of death, responsible for 18 million deaths annually (32% of global mortality). Conditions like coronary artery disease (CAD), stroke, and PAD significantly impact quality of life and healthcare systems. Atherosclerosis, driven by modifiable factors such as

hypertension, dyslipidaemia, diabetes, smoking, and obesity, is the primary cause of CVD. Secondary prevention through aggressive management of these risk factors, including high-intensity statin therapy, reduces recurrent cardiovascular events. This audit evaluates adherence to NICE (NG238) guidelines for CVD secondary prevention in a general practice setting, focusing on statin therapy and lipid management.

Methods: Patients diagnosed with CVD and prescribed statins between 01/07/2023 and 31/07/2024 were included. Data collection, via the SystemOne health record system, assessed adherence to guidelines on statin prescription, baseline and follow-up tests, and annual monitoring. Exclusions included incomplete data, discontinuation of therapy, and misclassified patients. Metrics analysed included percentages of patients on high-intensity statins, completion of baseline and follow-up tests, annual monitoring, and overall adherence to NICE NG238.

Results: Of 57 patients identified, 29 met inclusion criteria. All 29 patients (100%) were prescribed high-intensity statins, meeting guideline recommendations. Baseline lipid profiles and LFTs were completed in 76% of patients at initiation, while 24% lacked these essential tests. Only 38% of patients underwent follow-up monitoring 2–3 months post-initiation. Annual checks were performed in 22% of eligible patients (4 out of 18). Overall, 21% of patients fully adhered to NICE NG238 guidance. Exclusions included 28 patients due to incomplete data or misclassification, such as treatment outside the audit period.

Conclusion: While 100% adherence to high-intensity statin prescription was achieved, significant gaps were noted in baseline (76%), follow-up (38%), and annual monitoring (22%). Only 21% met all NICE NG238 standards, emphasizing the need for improved compliance and follow-up practices.

Application of Plant-Based Diet in the Prevention and Management of Coronary Artery Diseases

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ABSTRACT

Introduction: Coronary artery diseases (CAD) are amongst the leading causes of mortality worldwide and the most diagnosed heart condition. Management typically includes medications for both primary/secondary prevention and the associated angina. However, it is not without side effects or poor patient compliance. The study evaluates whether plant-based diets—which are gaining increasing popularity—can be applied to effectively prevent and manage CAD as a sustainable, low-cost adjunct, or even replacement to current pharmacological management.

Methods: A comprehensive review of meta-analyses, prospective cohort studies, longitudinal studies, and a case study was conducted. The focus was on predominantly plant-based diets rich in whole grains, fruits, vegetables, and nuts while excluding diets incorporating highly refined or sugary plant-based products. Effectiveness was assessed by reviewing risk ratios, lifestyle improvements (e.g., exercise tolerance), and plaque stenosis via angiographic data.

Results: Meta-analyses indicated a 29% risk reduction in CAD mortality in strict vegetarian diets (RR: 0.71, confidence interval [CI]: 95% 0.56–0.87) and a 24% reduction of CAD development in healthful plant-based regimes (RR: 0.75, CI: 95% 0.68–0.83). In women, frequent nut consumption reduced myocardial infarction risk by 35% (RR: 0.65, CI: 95% 0.47–0.89). The case study demonstrated significant improvement in exercise tolerance within just 2 years of shifting to a whole-foods plant-based diet, and the longitudinal study demonstrated regression over 10% of stenosis in coronary arteries—potentially reversing atherosclerosis.

Conclusion: A healthy whole-food plant-based diet can significantly prevent and manage CAD and complications by reducing stenosis and improving lifestyles. Whilst lifestyle changes are mentioned briefly within NICE guidelines, motivational interviewing on these diets through clinicians and patient education via campaigns, posters, etc., can further promote these diets with long-term benefits. This demonstrates plant-based diets as valuable adjuncts and even alternatives for CAD prevention and management.

Comparing Two-Finger and Two-Thumb Compressions in Infant CPR: A Systematic Review and Meta-Analysis

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ABSTRACT

Introduction: Following cardiac arrest, only 12% of infants survive to hospital discharge, and only 6% of these are neurologically intact. According to the UK Resuscitation Council, chest compression quality is the most important factor in improving the rate of infant survival with no neurological deficit. This systematic review and meta-analysis compare the performance of two compression techniques endorsed by Resus Council UK (RCUK) in infant CPR, the two-finger (TF) and two-thumb (TT) techniques. Outcomes assessed were chest compression depth, correct hand positioning, and full chest recoil.

Methods: A systematic search of PubMed was conducted for studies published between 2014 and 2024. Randomized controlled trials (RCTs) involving infant CPR on mannequins were included. Studies were included if they assessed one or more of chest compression depth, chest recoil, and hand positioning accuracy between the two-finger and two-thumb techniques. The data was extracted and reviewed for analysis.

Results: Nine studies, involving 552 participants, met the inclusion criteria. All were randomised crossover trials on infant manikins. The data revealed that the two-thumb technique achieved significantly deeper compressions than the two-finger technique (mean difference: TF = 32.15 mm $\pm$ 2.95 mm vs. TT = 40.18 mm $\pm$ 1.79 mm ($p = 0.01$)). However, the two-finger technique reported significantly greater compressions with complete chest recoil (mean difference: TF > TT ($p = 0.02$)). No significant difference was found in hand placement accuracy. These findings were consistent across different professional backgrounds and experience levels.

Conclusion: The two-thumb technique produces deeper chest compressions than the two-finger technique, but the two-finger technique achieves a greater proportion of compressions with full recoil. Novel techniques may explore how to achieve the superior two-finger chest recoil combined with two-thumb compression depth. Other factors, such as rescuer fatigue, also influence overall CPR quality and warrant further investigation. Additional research is needed to fully assess the relative benefits of both techniques in infant resuscitation.

Usefulness of Right Ventricle-Pulmonary Artery Coupling Obtained by Echocardiography in Assessing Chronic Thromboembolic Pulmonary Hypertension Severity

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ABSTRACT

Introduction: The impairment of right ventricle-pulmonary artery (RV-PA) coupling observed in patients with chronic thromboembolic pulmonary hypertension (CTEPH) is a recognised feature of poor prognosis in the disease progression. Indicators obtained via right heart catheterisation are reliable to assess RV-PA coupling; however, through an invasive procedure. This study sought to assess the usefulness of echocardiography-obtained measures of RV-PA as non-invasive parameters to assess CTEPH disease severity.

Methods and Results: A total of 134 patients with confirmed CTEPH were included in this study, being 72 males (53.7%) and 62 females (46.3%). Echocardiography assessed RV-PA by measuring the ratio between tricuspid annular plane systolic excursion (TAPSE) and pulmonary artery systolic pressure (PASP). Disease prognosis was evaluated via (1) assessment of heart strain by measuring N-terminal pro B-type natriuretic peptide (NT pro-BNP); and (2) assessment of symptom severity as reported by patients on the Cambridge Pulmonary Hypertension

Outcome Review (CAMPBOR) scoring system. The mean TAPSE/PASP value calculated was 0.3243 ± 0.1791 ; the mean NT pro-BNP obtained was 1158.41 ± 1244.52 pg/ml; and the mean CAMPBOR 'symptoms' score was 10.6 ± 6.0 . A statistically significant negative correlation was found between TAPSE/PASP and NT pro-BNP ($r = -0.455$, $p < 0.001$), and TAPSE alone also weakly correlated to NT pro-BNP ($r = -0.266$, $p < 0.001$). However, there was no correlation between TAPSE/PASP and CAMPBOR-symptom values ($r = -0.0228$, $p < 0.804$).

Conclusion: Echocardiography-derived RV-PA coupling, measured as the TAPSE/PASP ratio, correlates with objective markers of heart strain in patients with CTEPH. Results suggest the lower the coupling, the higher the concentrations of NT pro-BNP found in the blood. This relationship is more statistically significant than TAPSE alone, which indicates that measuring coupling is a more reliable tool than isolated metrics. However, the absent correlation between RV-PA coupling and CAMPBOR-symptom scores suggests that uncoupling may not translate directly to symptom severity experienced by patients with CTEPH.

Cardiovascular Risk Prediction: Evaluating the Usefulness of QR4 in Diverse Patient Cohorts—A Medical Student's Perspective

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ABSTRACT

Introduction: Cardiovascular diseases remain an important cause of death worldwide, according to World Health Organization, and most can be prevented by addressing lifestyle changes. In a landmark study in nature, nine risk factors, including COPD, learning disability, Down's syndrome, cancers of blood, lung, oral, and brain, along with pre-eclampsia and post-natal depression, were identified as risk predictors in comparison to existing risk algorithm models. Usefulness of the newer risk model from a medical student's perspective is evaluated.

Methods: A review of the QRISK predictor, NICE guidance, and QR4 was carried out along with viewpoints of general practitioners in three primary care settings.

Discussion: Most oropharyngeal and haematological cancers have at least 50% 5-year survival, whereas lung and brain cancers have 15% or less. It is challenging to address cardiovascular preventive strategies in this cohort, notwithstanding the impact of mental health and attributes to lifestyle when diagnosed with cancer. Equally, cardiovascular risks of chemoradiotherapy and protective effects of quitting smoking are important in such cohorts. Pragmatic strategies are needed to work effectively in this group to make a meaningful impact on quality of life as well as life expectancy. QR4 identifies Down's syndrome as a targetable risk, although congenital cardiovascular causes account for 50% of poor outcomes in this group. With increased life expectancy amongst these patients, QR4 augurs well to consider lifestyle changes and preventative strategies with statins. Maternal cardiovascular risks increase in pre-eclampsia, and statins provide a promising role; however, a meta-analysis suggests more convincing evidence may be needed. In conclusion, whilst the existing QRISK approved by NICE captures well-recognised risk factors, QR4 brings in more variables to accurately predict cardiovascular risk factors in a wider group of patients. Its usefulness in the cancer group can be less attractive to patients unless the life expectancy matches with patient acceptance.

Pharmacotherapeutic Options for Coronary Thrombosis Treatment: Where are We Today?

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ABSTRACT

Introduction: Advances in pharmacotherapy for coronary thrombosis treatment and prevention have transformed the clinical outcomes of patients with coronary artery disease but increased the complexity of therapeutic

decision-making. Improvements in percutaneous coronary intervention techniques and stent design have reduced the incidence of thrombotic complications, which consequently has increased the challenge of adequately powering clinical trials of novel antithrombotic strategies for efficacy outcomes. Knowledge of the pathophysiology of coronary thrombosis and the characteristics of antithrombotic drugs can help with therapeutic decisions.

Areas Covered: This review covers the pathophysiology of coronary thrombosis and the mechanisms of action of drugs developed for its treatment, provides an overview of the key issues in decision-making, and highlights key areas for further work in order to guide clinicians on how to individualize risk management and address gaps in the evidence base.

Expert Opinion: Individualization of antithrombotic therapy regimens has become a vital part of optimizing risk management in people with coronary thrombosis. A critical appraisal of the strengths and limitations of available drugs and the evidence supporting the use of different antithrombotic combinations is intended to provide direction to clinicians and point the way toward further improvements in pharmacotherapy for coronary thrombosis treatment and prevention.

Clinical Impact of Prolonged Ambulatory Electrocardiogram Monitoring on Ventricular Arrhythmia Detection in Children with Arrhythmogenic Cardiomyopathies

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ABSTRACT

Introduction: Arrhythmogenic cardiomyopathies (ACM) are a group of genetic heart muscle diseases associated with an increased risk of ventricular arrhythmias. Twenty-four-hour ambulatory electrocardiogram (ECG) monitoring is essential in sudden death risk stratification, but the impact of increasing use of longer-term non-invasive ambulatory ECG monitoring has not been evaluated.

Methods: Data from 56 consecutive individuals <18 years ($n = 7$ affected; $n = 2$ abnormal but non-diagnostic investigations; $n = 47$ family screening) attending a dedicated paediatric ACM clinic between January and June 2022 who underwent ambulatory ECG monitoring were compared to a historical cohort ($n = 57$) who attended the same clinic between January 2017 and December 2018 and to a third cohort ($n = 57$, all with structurally normal hearts) seen in a paediatric electrophysiology (EP) clinic between December 2021 and June 2022. Ambulatory ECG monitoring results, demographic data and other cardiac investigation results (echocardiography, 12-lead ECG monitoring, signal average ECG, exercise test and cardiac MRI) were collected for all cohorts.

Results: Patient demographics and clinical phenotypes were similar across all cohorts. However, mean age was significantly lower in the EP cohort compared to both ACM cohorts ($p < 0.001$). On ambulatory monitoring, 6/170 (3.5%) patients had ventricular tachycardia (VT). Five patients with VT were in the 2022 ACM cohort, and one was in the EP cohort. No patients from the historic ACM cohort presented with VT. All VT episodes were detected on longer-term monitoring after the first 24 hours of monitoring. A statistically significant association existed between using longer-term monitors and VT detection ($p < 0.001$).

Conclusion: Our results show that longer-term ambulatory ECG monitors are more likely to detect VT than 24-hour monitors. More widespread use of these devices may lead to increased ventricular arrhythmia detection, with potentially important implications for clinical practice. Whether VT detection on longer-term monitoring has the same prognostic significance as that identified on 24-hour monitoring requires further investigation.

Are All Patients on Mirabegron Being Invited to Their GP for a Regular Blood Pressure Check and do they Meet Their Demographic Blood Pressure Targets?

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ABSTRACT

Introduction: Mirabegron is a beta-3 adrenoceptor agonist approved by NICE for managing overactive bladder symptoms. Despite its therapeutic benefits, it poses a risk of increased blood pressure (BP), with severe hypertension being a contraindication. NICE guidelines recommend baseline BP checks and periodic monitoring during treatment to mitigate risks of malignant hypertension. This audit examines whether patients on Mirabegron at a single GP practice were regularly monitored for BP and if they met demographic BP targets.

Methods: This retrospective audit reviewed 37 patients prescribed Mirabegron between 2015 and 2024. Inclusion criteria encompassed patients on Mirabegron for at least 6 months. Using SystemOne, we identified patients with no recorded BP measurement in the past year. Follow-up invitations were issued to ensure compliance with NICE recommendations. BP data were analyzed for demographic target adherence per NICE hypertension guidelines.

Results: Of 37 patients, 30 (81%) had their BP checked in the past year, falling short of the 100% standard. Seven patients (19%) lacked a recorded BP measurement; of those seven, five were successfully recalled for checks, and two were scheduled for future assessments. Among the 35 patients with recent BP records, 31 (89%) met their demographic BP targets, while four exhibited elevated BP levels. Identified barriers included poor documentation and clinical complexities such as co-existing postural hypotension.

Conclusion: This audit highlights gaps in adherence to NICE guidelines, particularly baseline BP documentation and annual monitoring. While the recall system improved compliance, ongoing efforts are needed to achieve 100% adherence. Recommendations include systematic baseline BP checks, annual reviews, and enhanced documentation practices. A re-audit in 6 months is proposed to evaluate improvements and ensure consistent monitoring of patients on Mirabegron, reducing the risk of adverse cardiovascular outcomes.

Reflex Syncope and the Role of Cardiac Pacing: A Systematic Review

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ABSTRACT

Introduction: Reflex syncope refers to a failure in blood pressure auto-regulation, resulting in cerebral hypoperfusion and a syncopal episode. The three types of reflex syncope are vasovagal, situational, and carotid sinus hypersensitivity. It is a common complaint, occurring at least once in 33–40% of people by age 60, and holds a 33% risk of injury. These figures warrant better treatment options. In 2017, the first systematic review explored the role of cardiac pacing in reflex-mediated syncope, revealing a mixture of results. This review provides new insight into the role of cardiac pacing in reflex syncope.

Methods: We conducted a systematic search of all the randomised control trials, case-control and observational studies published in English up until September 2024 using PubMed and Cochrane. “Reflex syncope” and “cardiac pacing” were the only terms used in the search. Independent reviewers appraised the articles and resolved conflicts.

Results: We identified 98 publications, 79 of which were excluded using the predefined criteria, and 19 studies were included in the review. These included one retrospective cohort study and 18 randomised controlled trials, five of which were double-blinded. The total sample size across all studies was 2053, with 50% being men and an average age of 57.5. Overall, 15 studies concluded that dual chamber pacing (DDD) significantly reduced the time

to first recurrence of reflex syncope. The studies used pacemakers of different pacing modes and programming parameters. These included DDI mode (conventional), closed loop stimulation and rate drop response.

Conclusion: We can conclude that patients with recurrent reflex syncope and a dominant cardioinhibitory mechanism upon testing may benefit from the implantation of a DDD pacemaker. The most beneficial mode of pacing and programming parameters is still unclear, and future trials should be done to compare the efficacy of closed-loop stimulation, rate drop response, and combinations of both.

The Anatomy of Hypertrophic Obstructive Cardiomyopathy and its Surgical Management

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ABSTRACT

Introduction: Hypertrophic obstructive cardiomyopathy (HOCM) is a genetic disorder characterized by asymmetric septal hypertrophy, leading to left ventricular outflow tract obstruction (LVOTO). It is a major cause of sudden cardiac death in young adults, commonly presenting with symptoms such as chest pain, dyspnoea, and chest pain syncope. The initial management involves lifestyle modifications and pharmacological intervention, with surgery being used for refractory cases to pharmacological therapy or if the left ventricular outflow tract (LVOT) gradient ≥ 50 mmHg. The transaortic septal myectomy remains the gold standard surgical approach for LVOTO relief, though alternative approaches, such as the transapical beating heart septal myectomy, are gaining interest in specific clinical contexts. This study aims to highlight the anatomical features of HOCM, evaluate the indications for transaortic and transapical septal myectomy, and compare the efficacy of these surgical approaches in relieving LVOTO.

Methods: A literature search of PubMed databases using MeSH terms (“HOCM” AND “Septal myectomy” AND “Transapical septal myectomy”) identified suitable literature reviews from 1978 to 2024.

Results: Paper 1 evaluates the transapical approach to the septal myectomy. The study consisted of 47 patients, with 42 of these patients experiencing procedural success. It highlighted that the LVOTO and the extent of mitral regurgitation improved.

Paper 2 evaluates the transaortic approach, highlighting the preoperative LVOT gradient to be 56 ± 40 mmHg compared to a postoperative LVOT gradient of 1.2 ± 7 mmHg. This study included 139 patients, in which 129 patients survived within a 20-year follow-up period of the 129 patients; 109 were deemed to have a New York Heart Association functional class I or II.

Conclusion: Septal myectomy is an important intervention for symptomatic HOCM patients unresponsive to conservative management, with the transaortic approach currently preferred in specialized centres, but there is an emergence of the transapical beating heart approach, which is providing promising results.

Reviewing if Patients on Mirabegron have Had a Blood Pressure Recording in the Last Year

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ABSTRACT

Introduction: Mirabegron (Betmiga) is a beta-3 adrenoceptor agonist used to manage urinary frequency, urgency, and incontinence in overactive bladder syndrome. In 2015, the Medicines and Healthcare Products Regulatory Agency recommended regular blood pressure (BP) monitoring for patients on Mirabegron to mitigate the

risk of severe hypertension and associated cardiovascular events. Hypertension is a major contributor to cardiovascular disease, which accounts for 25% of all UK deaths annually. This audit assesses adherence to NICE guidelines by evaluating whether patients on Mirabegron have had their BP measured within the last 12 months.

Methods: A sample of 31 patients who were prescribed Mirabegron between February 2015 and April 2024 was identified using SystemOne. Patients initiated on Mirabegron in the last 6 months were excluded due to insufficient follow-up time. Data were collected on patient demographics, prescription dates, and the most recent BP measurements. The audit set a standard of 100% adherence to yearly BP monitoring, in line with NICE guidelines.

Results: Of the 31 patients audited, 77.4% (24 patients) had a recorded BP measurement within the past 12 months, falling short of the 100% standard. The patients' ages ranged from 43 to 92 years. Seven patients lacked a BP reading within the required timeframe. One hypertensive patient was identified without antihypertensive treatment, necessitating further clinical follow-up.

Conclusion: This audit concludes suboptimal adherence to NICE guidelines, with only 77.4% of patients on Mirabegron receiving annual BP monitoring. Strengths of the study include the use of a targeted search in SystemOne and demographic diversity in the sample. Limitations include the small sample size and exclusion of longer-term BP monitoring trends since 2015. Recommendations include integrating BP monitoring for Mirabegron patients into long-term condition review clinics, increasing patient education on hypertension risks, and re-auditing in 12 months to assess improvement.

How Effective is Neural Electrical Muscle Stimulation Compared to Cryotherapy for Treatment of Patients with Post-Stroke Spasticity?

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ABSTRACT

Introduction: Spasticity, a motor and sensory disorder from upper motor neuron lesions, affects ~25% of stroke survivors. Several treatments are available, including pharmacological (BOTOX, baclofen) and non-pharmacological therapies. There have been very limited studies comparing the effectiveness of such therapies against each other. Cryotherapy and neural muscle electrical stimulation (NMES) show promise. NMES uses electrical impulses to stimulate muscle contractions, while cryotherapy reduces muscle spasms and inflammation.

Methods: Two hundred patients who are 6 months post-stroke (aged 18–65) will be recruited. Eligibility requires reduced wrist plantar flexor spasticity and prior exercise therapy only, excluding those with prior cryotherapy/NMES, Botox, or implanted devices. Randomization will be computer-generated, with blinded outcome assessors. Both groups receive 20-minute sessions, 5 days/week of their respective therapy for 6 weeks, alongside standard rehabilitation. Cryotherapy will be delivered using a cooling airflow machine, and NMES will be over the wrist muscles in the form of pulsed current with a frequency of 50 Hz and a pulse duration of 0.1 ms, ON/OFF time: 5/15 seconds. Spasticity (Modified Ashworth Scale) and range of motion will be measured before and after sessions, and during 4-month follow-ups.

Results: It is hypothesized that the NMES group will show better recovery based on the Modified Ashworth Scale, and range of motion will be greater.

Conclusion: Both treatments are effective in reducing spasticity of the wrist extensors, but NMES has greater efficacy.

Does the Intake of Nattokinase Help Reduce Blood Pressure in Patients with Hypertension?

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ABSTRACT

Background and Aims: Hypertension is a significant health concern, affecting nearly 30% of adults in the UK. Given the side effects and burdens of lifelong medication, alternative interventions, including dietary approaches, must be explored.

Nattokinase, an enzyme found in natto, is a traditional Japanese food made by fermenting boiled soybeans with *Bacillus subtilis natto*. It is believed to have antihypertensive properties due to its fibrinolytic activity, which improves impaired fibrinolysis—a factor in hypertension and cardiovascular disease (CVD) pathogenesis. However, clinical evidence of its efficacy remains scarce. This review aims to assess current evidence for potential future clinical recommendations.

Methods: A literature search across two electronic databases using MeSH terms (natto/nattokinase and blood pressure (BP)/hypertension) identified three randomised clinical trials published in the past 5 years. All were included.

Results: Two studies reported significant systolic blood pressure (SBP) reductions: Liu et al. (-6.33 mmHg, $p < 0.0001$) over 90 days in 189 coronary artery disease patients (3615 FU/day), and Pham et al. ($p < 0.05$) over 60 days in 61 patients with subacute ischemic stroke (1200 FU/day). Diastolic blood pressure (DBP) reduction was significant only in the latter ($p < 0.05$). However, Hodis et al. found no significant changes in SBP (-1.0 mmHg, ± 2.2) or DBP (-0.4 mmHg, ± 1.5) over 5 years in 265 participants without CVD (2000 FU/day). No major adverse events were reported in any study.

Conclusion: Although studies suggest that nattokinase may reduce BP, especially in populations with pre-existing CVD, the findings are inconsistent. While this may be attributed to differences in study populations, dosing, or duration, further investigation is needed. Although nattokinase is safe with minimal side effects, current evidence does not support its routine clinical use.

The Relationship Between Anxiety and Takotsubo Cardiomyopathy

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ABSTRACT

Introduction: Takotsubo cardiomyopathy (TTC), also referred to as stress-induced cardiomyopathy, is a transient cardiac condition induced by physical or emotional stressors. Anxiety has increasingly been recognized as a psychological factor linked to TTC. This poster is designed to examine the relationship between anxiety and TTC through a review of the literature available.

Methods: A literature search was conducted using the keywords “anxiety” and “Takotsubo cardiomyopathy” in different databases. Systematic reviews, observational studies, and case reports that had evaluated anxiety as a trigger for Takotsubo cardiomyopathy were included for review. Data regarding patient demographics, psychological stressors, cardiac presentation, and autonomic impairment were obtained.

Results: The studies under review all pointed towards anxiety as a common trigger for Takotsubo cardiomyopathy. Emotional stressors, primarily acute anxiety episodes, were present in close to 80% of the reviewed cases. Case reports documented anxiety-induced TTC in various contexts, one during the COVID-19 pandemic context and another during the context of cancer diagnosis. Both cases demonstrated resolution of the cardiac dysfunction following treatment of the underlying psychological stress. Systematic reviews found that TTC is frequently

preceded by autonomic imbalance, marked by enhanced sympathetic activity and decreased parasympathetic function, which most likely mediates the cardiac effect of anxiety.

Conclusion: Anxiety is a powerful precipitant of TTC in the form of autonomic dysfunction and reversible cardiac dysfunction. Anxiety must be addressed with early intervention and counselling to minimize recurrence risk and enhance outcomes. More studies are needed to uncover the physiological connections between anxiety and TTC and create multidisciplinary preventative and management interventions.

Audit of Re-Operations Following Coronary Artery Bypass Graft Surgery at New Cross Hospital

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ABSTRACT

Background: Patients may require re-operation following cardiothoracic surgeries, such as coronary artery bypass graft (CABG), for various reasons. Bleeding is a common post-operative complication influenced by co-morbidities, medications, or operative technique, which necessitates re-operation.

In 2022–2023, the national re-operation rate for bleeding post-CABG surgery was 2.2%, with hospital rates ranging from 0% to 3.9%, nationwide. New Cross Hospital's rate was 2.89%, above the national average. This audit aims to identify reasons for re-operation following CABG surgery at New Cross Hospital and to propose recommendations based on findings.

Methods: All re-operations following CABG surgery in New Cross Hospital between January 2022 and December 2024 will be reviewed to identify reasons for re-operation. Retrospective data will be collected from the Clinical Web Portal and Dendrite and analysed using Excel. Operation notes, post-operative ward round notes, and discharge letters will be reviewed.

Results: In 2022–2023 and 2023–2024, 70.8% and 81.8% of re-operations after CABG surgery were due to bleeding. Patients requiring re-operation had higher EuroSCORE II and history of myocardial infarction (MI) compared to those who did not. The percentage of patients who died before discharge was also higher in those taken back to surgery: 12.5% vs. 1.3% in 2022–2023 and 18.8% vs. 5.13% in 2023–2024.

Conclusion: Bleeding is a known complication of CABG surgery and is associated with a higher EuroSCORE II and a history of MI. Therefore, these patients should be warned pre-operatively about this risk. Following CABG surgery, prophylaxis should be optimised to reduce the risk of bleeding and therefore re-operation. NICE recommends the use of tranexamic acid in patients undergoing surgery in which blood loss is expected. Post-operative care must address bleeding risks to lower mortality rates.