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Clinical Academic Training Programme Showcase 2025

Welcome

To all, a very warm welcome to the 2025 Showcase event of the Nottingham Clinical Academic Training Programme. This event is an opportunity for you to present your work, hear about the work of your peers, and to interact with clinical academics from a wide spectrum of research disciplines. Most of all it is a celebration of all you have achieved over the past year of your clinical academic training.

We have a variety of sessions today covering different areas of the training programme, including oral presentation sessions for selected work from our current Clinical Lecturers (CL) and Academic Clinical Fellows (ACF), poster sessions for clinical academic trainees at all levels, and breakout sessions with experienced researchers covering topics relevant to different stages of training.

As in previous years, prizes will be awarded for oral presentations at CL and ACF level, and for the foundation programme posters. This year we have also included time in the programme for poster viewing, rather than combining this with lunch. If you are presenting a poster, please be ready to talk about your work to the judges and your peers during the poster session!

The breakout sessions have been tailored to different stages of training. We have a session aimed at those looking to apply for ACF posts, a session looking at how to get the most out of your ACF post with a focus on PhD funding applications, and a session on further career development aimed at Clinical Lecturers. More information will be given about the content and venue of the breakout sessions during the day.

As well as taking part in the various scheduled sessions, we hope you also take the opportunity to chat with your colleagues and senior academics during the lunch and coffee breaks. This is a great place to share your work, hear about the experience of others, and to grow your academic networks. We hope that you find the programme interesting, stimulating and enjoyable.

Professor Rob Dineen
Co-Director of
Clinical Academic
Training Programme

Professor Shalini Ojha
Co-Director of
Clinical Academic
Training Programme

Clinical Associate Professor David Humes
Deputy Director of Clinical
Academic Training Programme

Clinical
Lecturers'
Oral
Presentations

Intestinal stromal populations are differentially expanded according to cancer cell TGF-beta pathway mutations

William Dalleywater, Tushar Kharabanda, Adam Bills, Mohammad Ilyas

Background

The colorectal cancer (CRC) microenvironment contains numerous stromal populations which interact with cancer cells to drive their phenotypes (1). The importance of TGF-beta/BMP in normal and neoplastic colonic epithelial biology is well-established. Interestingly, recent work has linked increased tumour GREM1, a fibroblast-secreted BMP-antagonist, to poor prognosis (2).

However, understanding of how stromal populations such as this arise has been previously limited owing to lack of mechanistic models.

Methods

We used an induced pluripotent stem-cell model of the human colon (3), which includes epithelial cells and stromal cells. We cultured six CRC cell lines with varying genotypes with intestinal stromal cells and used single-cell RNA sequencing to profile resulting cell types. Furthermore, stromal cells were treated with TGF-beta or TGF-beta inhibitors to explore a possible mechanism of stromal cell reprogramming.

Results

We showed that GREM1 is increased in stromal cells after culture with HCT116 and DLD1, which share microsatellite-instability (MSI) mutations in TGF-beta components, TGFBR2 and ACVR2A. GREM1-hi fibroblasts formed a unique cluster on single-cell RNA sequencing. PDGFRA-hi fibroblasts were diminished after co-culture with HCT116 and DLD1, as well as CACO-2 and HT29, both of which have microsatellite-stable (MSS) SMAD4 mutation. However, GREM1-hi fibroblasts were not enriched. PDGFRA-hi fibroblasts, but not GREM1-hi, were enriched after co-culture with LS174T (MSI) or LS1034 (MSS) (neither with TGF-beta pathway mutations). Cancer cells with TGF-beta signalling pathway mutations showed increased TGFB1 mRNA expression and we were able to recapitulate features of the GREM1-hi phenotype by treating stromal cells with TGF-beta, while TGF-beta inhibition maintained PDGFRA-hi fibroblasts.

Conclusion

These results suggest that specific stromal subsets align with TGF-beta pathway mutations. Our data suggests increased cancer cell TGF-beta secretion as a mechanism by which stromal cells are reprogrammed to a GREM1-hi phenotype. Given the roles of GREM1-hi and PDGFRA-hi fibroblasts in modulating TGF-beta/BMP signals, this raises the possibility that stromal cells may respond to modified cancer phenotype imparted by perturbed TGF-beta pathways to create a "just-right" level of TGF-beta/BMP signals in the microenvironment. We are currently further investigating drivers of each subset and functional consequences of each in the tumour microenvironment. This model opens the possibility of investigating how cancer stromal niches are formed and can be modified as a therapeutic strategy.

References

(1) Guinney, J., Dienstmann, R., Wang, X. et al. The consensus molecular subtypes of

colorectal cancer. Nat Med 21, 1350–1356 (2015) https://doi.org/10.1038/nm.3967

(2) Kobayashi, H., Gieniec, K., Wright, J. et al. The balance of stromal BMP signaling mediated by GREM1 and ISLR drives colorectal carcinogenesis. Gastroenterology 160, 1224-1239 (2021)

(3) Dalleywater, W., Predeus, A., Cakir, B. et al. Generation of transplantable and biologically responsive colonic tissue from human induced pluripotent stem cells using a rapid co-differentiation platform bioRxiv 2023.12.08.570795; doi:https://doi.org/10.1101/2023.12.08.570795

Developing mortality prediction tool in premature infants using machine learning and population-based data

T'ng Chang Kwok, Chao Chen, Jayaprakash Veeravalli, Carol Coupland, Ed Juszczak, Jonathan Garibaldi, Kirsten Mitchell, Don Sharkey

Background

Decision-making in the perinatal management of extremely preterm infants is challenging1. Prediction tools may support decision-making and parent counselling. The study aims to develop a mortality prediction tool using machine learning.

Methods

Population-based data from National Neonatal Research Database were extracted for infants born <28 weeks in England and Wales from 2010–2017 to develop, and from 2018–2020 to validate the tool. The predicted outcome was death before discharge. Nine perinatal predictors were determined from literature review: gestation, birthweight z-score, sex, antenatal steroids, multiple pregnancy, chorioamnionitis, prolonged rupture of membrane, congenital anomaly, and born in centre with Neonatal Intensive Care Unit.

Complete case analysis with nine machine learning approaches were used: stepwise logistic regression, AutoPrognosis 2.0, Adaptive Neuro-Fuzzy Inference System, Extreme Gradient Boosting, Neural Network, K-Nearest Neighbour, Long Short-Term Memory, Random Forest, and Support Vector Machine. Model performance was assessed in three domains: discrimination (area under receiver operating characteristic curve (AUROC)), calibration (calibration plot), and utility (decision curve analysis). The online tool was co-designed with parents using the best-performing approach with model explainability provided using Local Interpretable Model-agnostic Explanations.

Results

Of the 25,902 infants included, 5,550 (21%) died. The tool (Figure 1) (https://premoutcome. shinyapps.io/Death/) was based on logistic regression due to its interpretability and superior performance. The tool demonstrated good discrimination (AUROC (95% confidence intervals) of 0.746 (7.290–0.762)) and calibration with superior net benefit across probability thresholds of 10%–70%.

Figure 1: Online prediction tool

Conclusion

Our tool demonstrated promising performance. Further application studies are needed to understand its clinical utility.

References

1 Mactier H et al. Perinatal management of extreme preterm birth before 27 weeks of gestation. ADC FNN 2020;105(3):232-39.

Selective Entorhinal Cortex Atrophy Following Severe COVID-19: A 7T MRI Study Comparing Post-COVID and Alzheimer's Disease-Related Neurodegeneration

Beili Shao, Oluwatobi F. Adeyemi, Penny Gowland, Richard Bowtell, Olivier Mougin, Mohammad Zia U.H. Katshu, Elizabeta Mukaetova-Ladinska, Monica Goss, Timothy D. Girard, Beth E. Snitz, Mary Ganguli, Heidi I.L. Jacobs, Farhaan S. Vahidy, Tales Santini, Tamer S. Ibrahim, Sudha Seshadri, Akram A. Hosseini

Background

Cognitive impairment following COVID-19 has emerged as a significant concern, particularly in those recovering from severe illness. Post-mortem studies have reported neuroinflammation and reduced hippocampal neurogenesis in COVID-19 cases[1]. However, the structural brain changes underlying this dysfunction remain unclear. Our study investigates whether individuals recovering from severe COVID-19 exhibit hippocampal subfield atrophy like that observed in Alzheimer's disease (AD), using ultra-high-resolution 7T MRI[2].

Methods

We analysed hippocampal subfield volumes in four groups: (1) AD patients with CSF-confirmed amyloid pathology (n=32), (2) individuals >6 months post mild COVID-19 (Cv, n=13), (3) individuals >6 months post severe COVID-19 with prior ICU admission (ICU-Cv, n=9), and (4) healthy controls (HC, n=29). Cognitive assessments included the Montreal Cognitive Assessment (MoCA) and domain-specific tasks.

Results

AD patients exhibited widespread hippocampal subfield atrophy, including the entorhinal cortex (ERC), dentate gyrus (DG), and cornu ammonis (CA) fields. In contrast, ICU-Cv participants showed selective ERC volume loss compared to HC ($p < 0.05$), without broader hippocampal atrophy. Cv participants showed no significant volumetric differences. Average MoCA scores were lowest in AD (13.52), significantly lower than HC (27.58), Cv (27.24), and ICU-Cv (24.78). ICU-Cv showed a trend toward lower MoCA scores than HC, but differences were not significant. ICU-Cv patients also scored lower on Benson figure copy ($p = 0.048$) and vegetable naming ($p = 0.047$) compared to HC.

Conclusion

ERC, a key gateway for neocortical input to the hippocampus, is particularly susceptible in the early stages of AD, contributing to deficits in episodic memory and spatial navigation[3]. In ICU-Cv patients, we found selective atrophy of the ERC, without widespread hippocampal volume loss as seen in AD. This finding suggests that severe COVID-19 may lead to targeted neurodegeneration through mechanisms distinct from AD but potentially overlapping in terms of hypoperfusion, inflammation, and metabolic stress.

References

Matschke J, Lütgehetmann M, Hagel C, Sperhake JP, Schröder AS, Edler C, et al. Neuropathology of patients with COVID-19 in Germany: a post-mortem case series. Lancet Neurol. 2020;19(11):919–29.

Hari I, Adeyemi OF, Gowland P, Bowtell R, Mougin O, Vesey P, et al. Memory impairment in amyloid- -status Alzheimer's disease is associated with a reduction in CA1 and dentate gyrus volume: In vivo MRI at 7T. Neuroimage. 2024;292:120607.

Braskie MN, Small GW, Bookheimer SY. Entorhinal cortex structure and functional MRI response during an associative verbal memory task. Hum Brain Mapp. 2009;30(12):3981–92.

Inflammation plus immobilisation causes greater reductions in muscle mass following lower limb trauma than immobilisation alone

Shur NF, Crossland H, Constantin D, Cordon SM, Constantin-Teodosiu D, Brook MS, Atherton PJ, Smith K, Wilkinson DJ, Macdonald IA, Greenhaff PL

Background

Ankle fracture is the most common lower limb fracture and causes skeletal muscle atrophy and morbidity. The extent to which lower limb trauma and surgical fixation or cast immobilisation drive reductions in muscle mass, and the underlying mechanisms however are unclear.

Methods

Eleven patients (38.1 ± 5.2 yrs, BMI) 26.8 ± 1.3) following surgical fracture fixation and 8 healthy volunteers (HV) (28.5 ± 4.2 yrs, BMI of 23.5 ± 1.8) underwent 2 weeks (2/52) of unilateral limb casting. Change in calf muscle thickness (MT) was measured bilaterally using ultrasound. Myofibrillar protein synthesis (MPS) and whole-body muscle protein breakdown (MPB) were measured using oral stable isotope tracers. Pro-inflammatory cytokines were measured in serum before and after casting. Two-way repeated measures ANOVA was used to detect any differences. Data are mean ± SEM.

Results

MT decreased 7.2% in the HV casted leg (p≤0.01) and 16.7% in the patient's injured leg (p≤0.01) (Fig 1) with no change in the HV non-casted leg (p=0.06) or the patient's uninjured leg (p=0.59). Average daily MPS was lower in HV (p≤0.001) and the patient's injured leg (p≤0.001) over 2/52, with no difference between groups (p=0.9). Average MPS was lower in the HV non-casted leg (p≤0.001), but unchanged in the patient's uninjured limb (p=0.67). There was no difference in MPB between patients and HV at 2/52 (p=0.42). Cytokines were raised perioperatively in the patients but unchanged in HV.

Conclusion

Musculoskeletal trauma plus immobilisation causes greater reductions in MT than immobilisation alone, with comparable reductions in MPS over 2/52 and MPB at the 2/52 time point. However this may have missed early changes in MPB associated with marked inflammation perioperatively. The findings have important implications for the mechanisms underlying muscle atrophy in trauma and indicate that anabolic as well as anticatabolic strategies are required to preserve muscle protein.
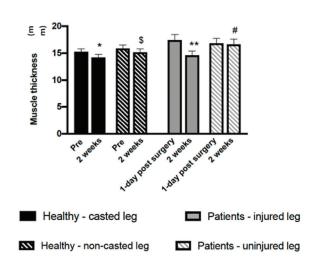

Figure 1. Muscle thickness data. Medial gastrocnemius muscle thickness (mm) in healthy volunteers and patients. **, p<0.05, p≤ 0.01 vs Pre within each limb, $, p=0.06 vs Pre within each limb, #, p<0.05 vs injured leg at corresponding time point.

Academic
Clinical Fellows'
Oral Presentations

Untitled abstract

Dr Hannah Igoe, BSc BMBS; Dr Joanne Emery, PhD; Prof Felix Naughton, PhD; Prof Jaspal Taggar, PhD FRCGP; Prof Jo Leonardi-Bee, PhD; and Prof Tim Coleman, MD FRCGP

Background

Smoking in pregnancy is a preventable cause of detrimental effects on mother and baby, exacerbating socioeconomic health disparities.[1,2] This study investigates predictors of making a quit attempt and smoking abstinence in pregnancy.

Methods

This observational cohort study used pooled data from two large UK multicentre smoking cessation intervention trials in pregnancy (N=1409).[3,4] Baseline predictor variables included demographic, smoking behaviour and quitting belief measures. Percentage of cigarettes cut down in early pregnancy was a novel variable. Outcomes (36 weeks' gestation) were having made a quit attempt (>24 hours) and smoking abstinence (both self-reported). Exploratory logistic regression analyses, with missing smoking outcomes imputed as non-abstinent, involved univariate then multivariable analyses. Sensitivity analyses included complete case analyses, and biochemically validated abstinence.

Results

1409 women were included in study analyses. In multivariable analyses, for making a quit attempt, higher intention to quit (OR 1.50, 95% CI 1.26 – 1.79); and higher combined self-efficacy score (OR 1.60, 95% CI 1.30 – 1.96) were statistically significant predictors. For smoking abstinence, higher percentage reduction in number of cigarettes smoked in early pregnancy (OR 1.02, 95% CI 1.01 – 1.02) and longer previous quit attempt (omnibus p =0.001) were statistically significant predictors.

Conclusion

Smoking beliefs, including motivational factors, were statistically significant predictors of making a quit attempt. However, smoking behaviours relating to cutting down the number of cigarettes in early pregnancy and having had a previous period of smoking abstinence > 6 weeks, were predictors of successful smoking abstinence.

This study adds to the evidence that motivational factors are important in initiating a quit attempt whereas positive behavioural changes are associated with smoking abstinence in pregnant women.[5] This information could be used by clinicians designing smoking abstinence support for pregnant women. Women who reduce the number of cigarettes they smoke very early in pregnancy might be more receptive to smoking abstinence support offered at that point.

References

1. Cnattingius S. The epidemiology of smoking during pregnancy: smoking prevalence, maternal characteristics, and pregnancy outcomes. Nicotine Tob Res. 2004;6(S2):S125-S140. doi:https://doi.org/10.1080/14622200410001669187
2. Pineles BL, Park E, Samet JM. Systematic Review and Meta-Analysis of Miscarriage and Maternal Exposure to Tobacco Smoke During Pregnancy. American Journal of Epidemiology. 2014;179(7):807-823. doi:10.1093/aje/kwt334
3. Naughton F, Prevost AT, Gilbert H, Sutton S. Randomized controlled trial evaluation of a tailored leaflet and SMS text message self-help intervention for pregnant smokers (MiQuit). Nicotine Tob Res. May 2012;14(5):569-77. doi:10.1093/ntr/ntr254
4. Coleman T, Clark M, Welch C, et al. Effectiveness of offering tailored text message, self-help smoking cessation support to pregnant women who want information on stopping smoking: MiQuit3 randomised controlled trial and meta-analysis. Addiction. Apr 2022;117(4):1079-1094. doi:10.1111/add.15715
5. Emery JL, Sutton S, Naughton F. Cognitive and Behavioral Predictors of Quit Attempts and Biochemically-Validated Abstinence During Pregnancy. Nicotine Tob Res. May 1 2017;19(5):547-554. doi:10.1093/ntr/ntw242

Accelerated brain ageing may mediate the negative effect of modifiable dementia risk factors on cognition in healthy individuals

Dewen Meng, Ali-Reza Mohammadi-Nejad, Christopher Tench, Stamatios Sotiropoulos, Dorothee P. Auer

Background

40% of dementia cases may be prevented or delayed by targeting twelve modifiable risk factors [1] but the pathomechanistic link of these risk factors with dementia remain under researched. The brain age gap (BAG) quantifies the difference between brain age as predicted from MRI appearances and chronological age, and thus captures the combined impact of an individual's environmental and disease exposures, lifestyle choices and genetic influences [2]. Using UK Biobank (UKBB) data we identified modifiable risk factors that are associated with higher BAG in otherwise healthy individuals [3]. We aim to validate this detrimental effect in an independent cohort and investigate if BAG mediates the association between risk factors and cognition.

Methods

Data from 677 healthy participants of the UKBB were analysed. Individual BAG was estimated using previously trained tissue-specific (grey matter[GM] and white matter[WM]) brain age prediction models. A composite score representing the cumulative effect of the predefined risk factors was computed using discriminant function generated from our previous study. Linear regression and mediation analyses were used to validate the effects of risk factors on tissue-specific BAG and quantify the extent to which tissue-specific BAG explained the association of risk factors and cognition.

Results

The combination of predefined five risk factors(education, systolic blood pressure [BP], hearing impairment, air pollution and smoking) was confirmed to significantly associate with GM-BAG while four of these(systolic BP, air pollution, smoking and education) and BMI were significantly associated with WM-BAG. Both GM- and WM-BAG significantly mediated(GM: 37.5%, WM:30.7%) the cumulative effect of risk factors on cognition.

Conclusion

Our findings indicated that even in healthy individuals, there is a detrimental effect of known dementia risk factors on brain ageing, and that BAG may partially mediate the link between risk factors and impaired cognition. This highlights the potential of BAG as an objective outcome measure for preventive lifestyle interventions targeting cognitive health.

References

1. Livingston, G., et al., Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. Lancet, 2020. 396(10248): p. 413-446.
2. Raz, N., et al., Regional brain changes in aging healthy adults: general trends, individual differences and modifiers. Cereb Cortex, 2005. 15(11): p. 1676-89.
3. Mohammadi-Nejad, A.-R., et al., Brains Under Stress: Unravelling the Effects of the COVID-19 Pandemic on Brain Ageing. medRxiv, 2024: p. 2024.07. 22.24310790.

Sodium Magnetic Resonance Imaging (MRI) in People with Generalised Epilepsy

Dr Hari Pai, Dr Nikos Evangelou, Dr Afagh Garjani, Professor Susan Francis, Ben Prestwich, Dr Michael F O'Donoghue

Background

Epilepsy is classified into:

1. focal epilepsies where seizures start in one brain region,

2. generalized epilepsies, where seizures start in networks involving both hemispheres from the seizure start. [1]

Focal, but not generalized epilepsy, is often associated with brain abnormalities that are easily visible on MRI [2]. Epilepsy that is normal on conventional MRI may have subtle abnormalities detectable using new MRI technique. Recent studies suggest that Sodium MRI can detect such abnormalities in focal epilepsy [3]. Sodium MRI has already revealed that patients with focal epilepsy have higher Total Sodium Concentration (TSC) levels compared to healthy controls and elevated Sodium in areas associated with seizure propagation [4]. TSC has previously been shown to be a marker of cell dysfunction [5]. It is unknown whether such abnormalities in TSC occur in generalized epilepsy. This project represents the first time that brain Sodium MRI will be conducted in patients with generalized epilepsy.

The primary objective of this study is to compare brain sodium concentration between patients with generalized epilepsy and healthy controls. Secondary objectives are to identify patterns of total sodium concentration (TSC) changes in generalized epilepsy and explore the relationship between brain TSC and the use of sodium channel-blocking anti-epileptic drugs.

Methods

This will be a single site, cross-sectional study where 20 participants will be recruited that will include 10 people with Juvenile Myoclonic Generalised Epilepsy (JME) and 10 healthy controls. During the visit patients with JME will be asked to complete the National Hospital Seizure Severity Scale questionnaire.

Benefits

This study will help us to explore the utility of Sodium MRI as a biomarker for neurological dysfunction. By analysing the distribution of TSC within subjects brains it may also help us to identify an "epileptogenic zone" (where seizures are first propagated) in generalized epilepsy. This could help plan surgical intervention for patients with drug-resistant epilepsy.

References

1. Stafstrom, C. E., & Carmant, L. (2015). Seizures and epilepsy: an overview for neuroscientists. Cold Spring Harbor perspectives in medicine, 5(6), a022426. https://doi.org/10.1101/cshperspect.a022426
2. Hauptman, J. S., Salamon, N., & Mathern, G. W. (2012). Neuroimaging in the definition and organization of the epilepsies: we're not there yet. Epilepsia, 53 Suppl 2(Suppl 2), 22–27. https://doi.org/10.1111/j.1528-1167.2012.03555.x
3. Ridley, B., Marchi, A., Wirsich, J., Soulier, E., Confort-Gouny, S., Schad, L., Bartolomei, F., Ranjeva, J. P., Guye, M., & Zaaraoui, W. (2017). Brain sodium MRI in human epilepsy: Disturbances of ionic homeostasis reflect the organization of pathological regions. NeuroImage, 157, 173–183. https://doi.org/10.1016/J.NEUROIMAGE.2017.06.011
4. Azilinon, M., Wang, H. E., Makhalova, J., Zaaraoui, W., Ranjeva, J.-P., Bartolomei, F., Guye, M., & Jirsa, V. (2022). Brain sodium MRI-derived priors support the estimation of epileptogenic zones using personalized model-based methods in Epilepsy. MedRxiv, 2022.12.14.22283389. https://doi.org/10.1101/2022.12.14.22283389
5. Huhn, K., Engelhorn, T., Linker, R. A., & Nagel, A. M. (2019). Potential of Sodium MRI as a Biomarker for Neurodegeneration and Neuroinflammation in Multiple Sclerosis. Frontiers in neurology, 10, 84. https://doi.org/10.3389/fneur.2019.00084

Awards/grants

Prospective Acceptability of Non-Invasive Brain Stimulation (Neuromodulation) Techniques for Mental Health Conditions

Sue Fen Tan, Paul M Briley

Background

Non-invasive brain stimulation, or neuromodulation, includes transcranial magnetic stimulation (TMS) and transcranial electrical stimulation (TES), which can be delivered simultaneously. Although TMS has been approved in the United Kingdom (UK) for treatment resistant depression since 2015, the public's sentiment towards neuromodulation techniques is largely unknown as there are limited neuromodulation centres in the UK. Existing research on neuromodulation acceptability focusses on tolerability and side effect profile, but prospective acceptability towards neuromodulation is equally imperative for uptake of these innovative techniques in treating mental health disorders. This is the first study that explores the UK public's initial impressions of TMS, TES, and their combined use in mental health conditions among young people and adults, and how demographic factors may influence these perceptions.

Methods

A mixed method survey on affective attitude, perceived burden, ethicality, intervention coherence, opportunity cost, perceived effectiveness, and self-efficacy was designed to reflect the seven domains of the Theoretical Framework of Acceptability. As the participants may have limited background knowledge of neuromodulation, we produced short informational videos and leaflets to accompany the survey. These resources were co-produced with a neuromodulation patient and public involvement group to ensure clarity and accessibility (see example video screenshot attached). The survey is open to individuals aged 16 and older who have or had chronic pain, mental health, or neurological conditions, or who care or cared for individuals with these conditions. This study received joint funding from the Nottingham NIHR Biomedical Research Centre, the NIHR MindTech Research Centre, Neuromod+, and the Mapperley Hospital Research Fund.

Results

The survey is awaiting ethical approval from the University of Nottingham and will run until June 2025.

Conclusion

Survey results will inform study design and patient information for future clinical trials. Participants can register their interest for a follow-up focus group on a separate questionnaire after completing the survey.

References

1. NICE (2015). Repetitive transcranial magnetic stimulation for depression. Retrieved 27 November from https://www.nice.org.uk/guidance/ipg542/ifp/chapter/What-has-NICE-said
2. Morriss et al. (2024). Connectivity-guided intermittent theta burst versus repetitive transcranial magnetic stimulation for treatment-resistant depression: a randomized controlled trial. Nature Medicine, 30(2), 403-413. https://doi.org/10.1038/s41591-023-02764-z
3. Webster et al. (2025). Acceptability, tolerability and safety of the BRIGhTMIND trial: Connectivity-guided intermittent theta-burst stimulation versus F3- repetitive transcranial magnetic stimulation for treatment-resistant depression. Comprehensive Psychiatry, 136, 152544. https://doi.org/https://doi.org/10.1016/j.comppsych.2024.152544
4. Sekhon et al. (2017). Acceptability of healthcare interventions: an overview of reviews and development of a theoretical framework. BMC Health Serv Res17, 88. https://doi.org/10.1186/s12913-017-2031-8

Clinical
Lecturers'
Posters

Assessing the effect of ethnicity and socioeconomic status on outcomes in asthma: A systematic review

Shruti Chandrasekharan[1], Emilia Barber[2], Adrije De[2], Christos Chalitsios[3], Jaspreet Kaur[4], Winifred Ekezie[5], Tricia M. McKeever[6], Dominick E. Shaw[7], Ireti Adejumo[6]

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2. University of Nottingham Medical School
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7. University of Leicester

Background

The international literature suggests that asthma outcomes are influenced by various biological and non-biological factors, including ethnicity and socioeconomic status (SES) (1, 2). This review aims to evaluate the literature on the roles of ethnicity and socioeconomic disadvantage in asthma outcomes in the United Kingdom (UK).

Methods

Embase, Ovid MEDLINE, and Web of Science were searched for citations published between 1998 and 2023. Searches were conducted in July 2023 and updated in May 2024.

Included studies were observational, and examined objectives related to minority ethnic heritage and/or SES in adults' asthma in the UK

The full protocol is registered on PROSPERO (CRD42023426156).

Results

Of 15 003 identified studies, 55 observational studies were included for full text review and 12 studies so far have been identified for inclusion. Interim results demonstrate that social factors were associated with an increased risk of asthma hospitalisations (5/5 reporting studies), exacerbations (2/2 reporting studies) and deaths (1/1 study).

Conclusion

Interim results for a systematic review suggest that minority ethnicity and socioeconomic disadvantage are associated with a risk of adverse asthma outcomes asthma in UK adults in line with the international literature.

References

1. Akin-Imran, A., et al. (2023). "Ethnic variation in asthma healthcare utilisation and exacerbation: systematic review and meta-analysis." ERJ Open Res 9(3).
2. Redmond, C., et al. (2022). "Socioeconomic disparities in asthma health care utilization, exacerbations, and mortality: A systematic review and meta-analysis." J Allergy Clin Immunol 149(5): 1617-1627.

FIT for Speed: Fast-Tracking Bowel Cancer Diagnosis in High-Risk Patients

J Bailey, J Jones, C Chapman, A Banerjea, D Humes

Background

Colorectal cancer (CRC) is a leading cause of cancer-related deaths in the UK, with most cases diagnosed in symptomatic patients[1, 2]. Faecal Immunochemical Testing (FIT) is widely used to guide referrals, with a threshold of ≥10 μg Hb/g faeces triggering urgent investigation[3]. FIT identifies a high-risk group (≥100) with disproportionately high CRC rates[4]. To improve diagnosis and outcomes, a FIT-stratified, expedited One Stop Colonoscopy and Radiological Staging (OSCARS) pathway was introduced. This study evaluates its effectiveness within the 2WW referral system.

Methods

This retrospective study examined CRC diagnostic pathways at NUH NHS Trust from January 2021 to October 2023, including all 2WW referrals with FIT testing. Patients were grouped based on their FIT and blood tests. Primary outcomes included diagnostic and treatment time intervals, with comparisons using Mann-Whitney U and chi-squared tests. The study compared the high-risk OSCARS pathway to standard urgent pathways.
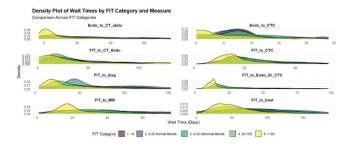
Results

Patients with a FIT ≥100 μg Hb/g had the fastest access to investigations, diagnosis, and treatment across all metrics. Median time to whole colon investigation was just 14 days, compared to 25 days in those with FIT <100. Time from FIT to diagnosis was 25 days in the highest FIT group, versus 33.5-110 days for other FIT groups. Similarly, time to treatment was 50 days for FIT ≥100, compared to 57.5–188 days for lower-risk categories. Imaging and endoscopy coordination were also notably faster in the high FIT group, supporting the value of stratified, expedited pathways.

Conclusion

Interim results for a systematic review suggest that minority ethnicity and socioeconomic disadvantage are associated with a risk of adverse asthma outcomes asthma in UK adults in line with the international literature.

References

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA: A Cancer Journal for Clinicians. 2021;71(3):209-49.
2. Saw KS, Liu C, Xu W, Varghese C, Parry S, Bissett I. Faecal immunochemical test to triage patients with possible colorectal cancer symptoms: meta-analysis. Br J Surg. 2022;109(2):182-90.
3. National Institute for H, Care E. Quantitative faecal immunochemical testing to guide colorectal cancer pathway referral in primary care. London: NICE; 2023 2023/08/24.
4. Bailey JA, Morton AJ, Jones J, Chapman CJ, Oliver S, Morling JR, et al. 'Low' faecal immunochemical test (FIT) colorectal cancer: a 4-year comparison of the Nottingham '4F' protocol with FIT10 in symptomatic patients. Colorectal Dis. 2024;26(2):309-16.

Density Plot of Wait Times by FIT Category and Measure
Comparison Across FIT Categories

The Influence of Probable Diagnostic Assignment on CAMHS Referral Acceptance: A Secondary Analysis of Randomised Controlled Trial (RCT) data

Dr Salah Basheer, Dr Josephine Holland, Dr Chris Partlett, Prof Kapil Sayal

Background

Increasing demand for Child and Adolescent Mental Health Services (CAMHS) and long waiting times are exacerbated by incomplete clinical information, leading to high referral rejection rates (Frith, 2017). Standardized diagnostic assessment tools, such as the Development and Well-Being Assessment (DAWBA), gather symptom information from parents/carers and young people, apply validated diagnostic algorithms and provide decision makers with probable diagnostic scores. Prior research suggests that integrating DAWBA with referral letters enhances prioritization of children with clinical needs (Hansen et al., 2023). This study examines whether DAWBA-assigned probable diagnoses influence CAMHS referral acceptance.

Methods

This secondary analysis used data from the STADIA trial, a multicentre RCT across eight large National Health Service (NHS) Trusts in England, all providing specialist CAMHS (Sayal et al., 2025). The sample included young people (5–17 years) with documented referral outcomes (n=612). Variables included DAWBA-assigned diagnostic probabilities, Strengths and Difficulties Questionnaire (SDQ) impact scores, sociodemographic data (age, sex, ethnicity, deprivation index), recruiting site and previous CAMHS referral. Univariable and multivariable analyses were performed.

Results

Sociodemographic factors did show any effect on referral decision. Referral acceptance varied across recruiting sites (16.7% to 72.7%). Higher parent-rated SDQ impact scores (OR = 1.11, 95% CI: 1.02–1.22) and previous CAMHS referral (OR = 2.3, 95% CI: 1.41–3.74) increased referral acceptance. However, DAWBA-assigned diagnostic probabilities did not influence decisions: referrals were rejected for 54% of cases with emotional disorders, 78.6% with behavioural disorders, and 52.9% with both.

Conclusion

While previous CAMHS referral and SDQ impact scores were associated with referral acceptance, DAWBA diagnostic probabilities were not, suggesting that some children with significant clinical needs may not receive timely help. Additionally, site-level variability in referral acceptance, despite clinical needs, highlights the influence of operational factors, emphasizing the need for uniform referral decision-making processes to ensure equitable access to services.

References

Frith, E. (2017). Access and waiting times in children and young people's mental health services. https://www.semanticscholar.org/paper/Access-and-waiting-times-in-children-and-young-Frith/b0440f4b79ee76fe7161d6b2aa77c0b967569e2d

Hansen, A. S., Kjaersdam Telléus, G., Mohr-Jensen, C., Færk, E., & Lauritsen, M. B. (2023). The effect of the Development and Well-Being Assessment as an adjunct to standard referral letters on referral decisions by child and adolescent mental health services—a randomized feasibility trial. Clinical child psychology and psychiatry, 28(2), 434-449

Sayal, K., Wyatt, L., Partlett, C., Ewart, C., Bhardwaj, A., Dubicka, B., ... & Montgomery, A. (2025). The clinical and cost effectiveness of a STAndardised DIagnostic Assessment for children and adolescents with emotional difficulties: the STADIA multi-centre randomised controlled trial. Journal of Child Psychology and Psychiatry.

Developing dual neuromodulation treatments for depression and anxiety conditions

Paul M Briley (Clinical Assistant Professor in General Adult Psychiatry), Lucy Webster, Sue Fen Tan (ACF), Alexander Axford (AFP), Jemima Shickle, JeYoung Jung, Domenica Veniero, Richard Morriss

Background

Non-invasive brain stimulation (neuromodulation) techniques have the potential to transform treatment for certain mental health conditions. One such technique that uses precisely timed magnetic pulses, called "transcranial magnetic stimulation" (TMS), is NICE recommended for treating major depressive disorder (MDD). Whilst some patients report early and lasting benefit with TMS, for others, improvement is delayed or insufficient (Briley et al., 2024a)

I have demonstrated that combining TMS with a second neuromodulation technique that uses weak electric currents – transcranial alternating current stimulation (tACS) – leads to greater target engagement and modulation of a marker of antidepressant efficacy than either technique alone (Briley et al., 2024b). The techniques are delivered at the same time and in synchrony. In this presentation, I will report four studies that are building upon my initial healthy volunteer study, with the aim of developing dual neuromodulation as an approach for boosting (augmenting) TMS for MDD as well as anxiety conditions.

Methods

Study 1 delivers one week of dual neuromodulation, or TMS alone, for people with mild-moderate MDD, examining effects on brain activity, cognition and an antidepressant marker, and including qualitative components on participant experience and acceptability.

Methods (continued)

Study 2 is a healthy volunteer study exploring whether "dual-site" dual neuromodulation (i.e., TMS and tACS targeting different brain sites) modifies communication between brain areas and might have anxiolytic effects. People with mild-moderate anxiety receive single sessions of the approach, with different timing relationships between the two techniques.

Study 3 is a healthy volunteer study optimising the tACS component of dual neuromodulation by exploring effects according to target brain site. Study 4 is a large-scale survey, developed in collaboration with people with lived experience of MDD, on the prospective acceptability of dual neuromodulation. Studies 3 and 4 will not be described further in this abstract (see abstracts by AFP Alexander Axford and ACF Sue Fen Tan).

Results

For Study 1, an initial pilot phase is complete, with results supporting greater target engagement from dual neuromodulation (measured with electroencephalography and functional near infrared spectroscopy), with the two approaches equally well tolerated.

For Study 2, early findings are that dual neuromodulation affects brain activity and connectivity, cognition and emotion processing, in different directions according to the timing relationship between the two techniques.

Conclusion

In conclusion, while most AD clinical trials of systemic treatments report concomitant topical treatments, reporting practices for rescue topicals were less consistent. The observed association with clearer reporting in more recent publications suggests a positive trend. Nonetheless, a standardized approach to reporting topical therapy in AD trials is needed to enhance transparency and interpretability.

References

[1]Briley et al. (2024a), doi:10.1038/s44184-024-00077-8

[2]Briley et al. (2024b), doi:10.1162/imag_a_00073

Agreement between a Chat-GPT advanced reasoning model and human assessors performing Cochrane risk of bias assessments of randomised controlled trials

Brett Doleman, Jonathan Lund, John Williams

Background

Artificial intelligence (AI) has the potential to revolutionise the conduct of research and automate many tasks which would normally require a significant number of hours for researchers to undertake. Cochrane risk of bias (ROB) version 2 assessments are particular time consuming, with staff resources averaging 358 minutes per study [1]. Although AI has shown promise in many areas, the agreement between humans and AI for ROB assessments is often poor, especially with the older AI models [2]. Therefore, we evaluated the newer advanced reasoning model Chat-GPT o3-mini-high and assessed agreement with human assessors for risk of bias.

Methods

We included 20 randomised controlled trials (RCTs) for evaluation. Cochrane risk of bias (version 2) was used by a human assessor with extensive experience in meta-analysis and clinical trials. A second human reviewer also performed these assessments, and studies were only included where 100% agreement was reached on initial assessments by both human assessors. A dedicated prompt was created to mirror human training for our ROB assessments. A weighted kappa in R was used to measure agreement between Chat-GPT and human assessors.

Results

The mean reasoning time was 17.9 seconds for Chat-GPT assessments. The agreement for randomisation, blinding of participants and anaesthetists, missing outcome data, bias in the outcome assessment, selection of the reported result and overall risk were: 0.42 (p=0.05), 0.57 (p=0.01), 0.12 (p=0.53), 0.26 (p=0.26), 0.42 (p=0.04) and 0.29 (p=0.09) respectively.

Conclusion

Although many assessments were better than chance, similar to previous models [2], there was only slight to moderate agreement between Chat-GPT and human assessors for risk of bias assessments. Despite the obvious time benefits of Chat-GPT, agreement with human assessments is currently suboptimal. Future studies should aim to deliver more specific prompts and feedback in an attempt to improve ongoing performance.

References

[1] Crocker TF, Lam N, Jordão M, Brundle C, Prescott M, Forster A, Ensor J, Gladman J, Clegg A. Risk-of-bias assessment using Cochrane's revised tool for randomized trials (RoB 2) was useful but challenging and resource-intensive: observations from a systematic review. Journal of Clinical Epidemiology 2023; 161: 39-45.

[2] Pitre T, Jassal T, Talukdar JR, Shahab M, Ling M, Zeraatkar D. ChatGPT for assessing risk of bias of randomized trials using the RoB 2.0 tool: A methods study. Medrxiv 2023: 2023-11.

Developing a respiratory infection patient and public involvement group at University of Nottingham

Frances S Grudzinska, Wei Shen Lim, Tricia McKeever and Charlotte Bolton

Background

Community acquired pneumonia (CAP) is a common cause of hospitalisation in adults. CAP is associated with high short-term mortality, but also significant morbidity in survivors[1]. Over 60% of survivors have a primary care consultation within one week of discharge, and 15% are re-admitted to hospital[2, 3].

There are very few studies exploring this problem, but the patient perspective clearly demonstrates the challenges of CAP recovery.

Our research aim is to establish patient reported outcomes that accurately measure recovery from CAP.

The challenge was a lack of public and patient involvement and engagement (PPIE) group in CAP, given that this was a patient focused problem we set out to establish a new PPIE group to support our work.

We recognised the following challenges:

1. Identification of PPIE contributors following an acute illness which typically has no clinic follow up
2. Limited diversity of contributors
3. Lack of confidence in contributors to support research development
4. This abstract describes the methods used to recruit and train PPIE contributors

Methods

We targeted hospitalised inpatients and used community sources such as respiratory support groups to recruit contributors.

We identified a need for socio-economic diversity so developed a collaboration with a local community centre in a deprived area of Nottingham.

We undertook a survey of contributors to understand their PPIE experience and identify training needs. Using this data we worked with Asthma & Lung UK to deliver a bespoke training workshop for the contributors.

Following this we held regular meetings to develop CAP research. We intend to complete a further survey to understand contributor's experiences.

Results

We recruited 14 PPIE contributors and have delivered three sessions to date. By June 2025 we will have contributor feedback and outputs to present.

Conclusion

We developed a structured programme to recruit & train PPIE contributors in Respiratory Infection research.

References

1. Pick HJ, Bolton CE, Lim WS, McKeever TM. Patient-reported outcome measures in the recovery of adults hospitalised with community-acquired pneumonia: a systematic review. The European respiratory journal. 2019;53(3).
2. Lim WS, Lawrence H. British Thoracic Society National Audit Report: Adult Community Acquired. BTS National Audit Report: Community Acquired Pneumonia in Adults2019.
3. Baskaran V, Pearce F, Harwood RH, McKeever TM, Lim WS. Primary care consultations after hospitalisation for pneumonia: a large population-based cohort study. The British journal of general practice : the journal of the Royal College of General Practitioners. 2021;71(705):e250-e7.

Impact of co-existing osteoporosis on the risk of readmissions following a severe COPD exacerbation

Ayushman Gupta

Supervisors: Tricia McKeever, Charlotte Bolton

Background

Readmissions following a severe chronic obstructive pulmonary disease (COPD) exacerbation are common though underlying causes are poorly understood[1]. Co-existing osteoporosis is associated with negative outcomes in people with stable COPD as well as following exacerbations[2]. Yet it is also often overlooked. Little is known about the reasons for post-exacerbation morbidity in people with osteoporosis.

This preparatory work will:

- conduct a systematic review (SR) of the literature assessing the relationship between bone health and post-COPD exacerbation outcomes
- explore the impact of co-existent osteoporosis on first severe COPD exacerbations and subsequent all cause healthcare utilisation using a population-based dataset, to understand the burden of post exacerbation morbidity

Methods

SR: Searches in electronic databases will identify studies reporting associations between abnormal bone health and risk of adverse post discharge outcomes in patients hospitalised with COPD exacerbations. Meta-analysis will enable pooled odds ratios of readmissions/mortality by osteoporosis.

Methods (continued)

Population-based dataset: The Clinical Practice Record Datalink and Hospital Episode Statistics will be used to identify adults > 40 years with a diagnosis of COPD between 1/7/2004-31/12/2019. Analyses will include comparing the odds of co-existing osteoporosis in people admitted due to COPD exacerbation for the first time vs no COPD hospitalisations. The nature and factors for healthcare utilisation in those hospitalised with COPD exacerbations with and without osteoporosis will also be studied.

Results

Protocols are pending submission.

Conclusion

This will form the basis from which patients with COPD and co-existent poor musculoskeletal (MSK) health can be best managed, particularly in relation to exacerbations.

References

1. Suissa S, et al. Long-term natural history of chronic obstructive pulmonary disease: severe exacerbations and mortality.Thorax. 2012;67(11):957-63.
2. Njoku CM, et al. Risk factors and associated outcomes of hospital readmission in COPD: a systematic review.Respiratory Medicine. 2020;173:105988.

Can we use pulmonary MRI to assess long term sequalae of bronchopulmonary dysplasia?

Christabella Ng, Andrew Prayle

Background

Bronchopulmonary dysplasia (BPD) is a severe lung disease and the most common breathing complication in premature infants. Infants with severe BPD are usually discharged from intensive care with home oxygen needed for months to years, which impacts on quality of life. BPD is defined by the need for additional oxygen at a certain age but does not account for changes in lung structure or function. Lung function is the single-best predictor of survival in the general population. People with BPD grow up to have reduced lung function.

Multiple studies have reported clinical differences and structural changes using MRI (magnetic resonance imaging) in neonates and children with a history of BPD. However, there are limited studies which evaluate the lung function using MRI or the long term sequalae of BPD.

We aim to use MRI to understand the structural and functional changes in older children with a history of BPD.

Methods

Children aged six years and over with and without a history of bronchopulmonary dysplasia will be invited to undergo lung MRI and lung function testing.

Results

We have formed a collaboration with clinicians and MRI experts across the East Midlands to ensure a sufficient sample size is achieved.

Conclusion

Understanding the progression of BPD and subsequently finding a preventative treatment for BPD is a national neonatal priority. Nottingham is a world leading centre for MRI and we have established a collaborative group to undertake this research, which will transform the way BPD is managed from the neonatal period through to childhood and adulthood.

A scoping review of multi-factorial tools for preventing falls in adults

Michael J Taylor, Iskra Potgieter, Frances Allen, Grace Brough, Janet Darby, Denise Kendrick, Pip Logan, Denis Mutuku, Elizabeth Orton

Background

Falls in over-65s are common and are associated with high rates of injury and mortality[1], and high costs[2]. The World Guidelines for Falls Prevention[3] recommend that multifactorial falls risk assessments (MFRAs) are conducted for persons at risk of falling, so that identified, modifiable risks factors can be addressed. MFRAs being performed by non-clinicians, such as social prescribing practitioners, may help to reduce pressures upon the clinical workforce[4]. Tools, comprising an MFRA component along with guidance for how to reduce identifiable risks through preventative interventions, have been developed that could be used by people without clinical training. As far as we know, no literature review describing the components, and evidence for the effectiveness, of such tools has been published.

Methods

We conducted a scoping review to identify tools that can be used by people without clinical expertise to conduct multifactorial falls risk assessments for adults and specify associated interventions to reduce identified risks. MEDLINE, Embase, CINAHL, PsychINFO and SafetyLit were searched. Narrative synthesis was performed for retrieved articles.

Results

After screening of 7,143 identified articles, 368 full texts were reviewed, and nine (six randomised trials and three quasi-experimental studies) were included. We synthesised the components of the tools to create a list of 14 types of modifiable and assessable risks (Table 1). Three trials reported tools being associated with statistically significant reductions in falls rates or risk of falling.

Conclusion

An individual's risk of falling may be reduced through interventions that address a variety of modifiable factors. These interventions could be used to prevent falls in a wide range of settings, by practitioners with or without specialist clinical training. Wide scale implementation of such interventions could result in falls-related injuries being prevented, healthcare pressures and costs being lessened, and a greater number of patients benefiting from evidence-based falls prevention intervention.

References

Haagsma JA, Olij BF, Majdan M, Van Beeck EF, Vos T, Castle CD, Dingels ZV, Fox JT, Hamilton EB, Liu Z, Roberts NL. Falls in older aged adults in 22 European countries: incidence, mortality and burden of disease from 1990 to 2017. Injury prevention. 2020 Oct 1;26(Suppl 2):i67-74.

Su FY, Fu ML, Zhao QH, Huang HH, Luo D, Xiao MZ. Analysis of hospitalization costs related to fall injuries in elderly patients. World journal of clinical cases. 2021 Feb 26;9(6):1271.

Montero-Odasso M, Van Der Velde N, Martin FC, Petrovic M, Tan MP, Ryg J, Aguilar-Navarro S, Alexander NB, Becker C, Blain H, Bourke R. World guidelines for falls prevention and management for older adults: a global initiative. Age and ageing. 2022 Sep;51(9):afac205.

NHS England, NHS Improvement. Science in healthcare: Delivering the NHS long term plan [Internet]. The Chief Scientific Officer's strategy. 2020 Mar [cited 2025 Apr 03]. Available from: https://www.england.nhs.uk/wp-content/uploads/2020/03/science-in-healthcare-delivering-the-nhs-long-term-plan.pdf

Table 1. Types of falls risks that were assessed in the nine identified tools

Falls risk	How frequently (out of nine) the component was measured in the tool
Using medications	9 (100%)
Home hazards	7 (78%)
Footwear and condition of the feet	6 (67%)
Balance, gait and strength	6 (67%)
Medical history	6 (67%)
Vision and hearing	5 (55%)
Continence	5 (55%)
Use of walking aids	4 (44%)
Diet	4 (44%)
Lack of assistance	4 (44%)
History of falls	3 (33%)
Cognition	3 (33%)
Fear of falling	2 (22%)
Sleep, living alone and negative affect	1 (11%)

Academic Clinical Fellows' Posters

Geriatric Oncology in medical education: Optimising undergraduate curriculum design and implementation

Je Ern Chooi

Background

As the general population is ageing, the incidence of cancer in those aged 75 and above will rise from 36% to 46% by 20341. Nevertheless, geriatric oncology is not part of the formal syllabus in the undergraduate curriculum in the United Kingdom2. The International Society of Geriatric Oncology has proposed strategies to address this unmet need in medical education2. The aim of this research programme is to determine how best to embed geriatric oncology into the undergraduate medical curriculum in the UK through identifying optimum syllabi, pedagogy and assessment strategies. The research also aims to answer how do international medical undergraduate training curricula address geriatric oncology, explores the challenges to implementing geriatric oncology within undergraduate medical curricula and what are the key geriatric oncology learning outcomes and assessment strategies to include in future change to medical curricula.

Methods

The study design for this research programme involves successive empirical data collection to be merged and subsequently be generate a composite curriculum model and implementation strategy. My role in this multi-phase project includes developing survey instruments to be sent to all UK medical schools to collect data on whether and how they address geriatric oncology in their curricula, including barriers and facilitators. Following that, I will organise semi-structured interviews with purposive sample of medical school curriculum leads, geriatric oncology experts and medical education experts to explore the themes identified from the survey. Qualitative data will be collected, and a document analysis will be produced to capture key data on current curricula to aid future development.

Results

The data analysed from this multi-phase research programme will be used to build consensus using the DELPHI method on the key geriatric oncology learning outcomes and assessment strategies to include in proposals to Medical School Councils for consideration for future changes to medical curricula.

Conclusion

This research programme will be a crucial step in preparing the future medical workforce in improving the care of cancer patients in geriatric population.

References

1. Cancer Research UK. Improving Cancer Treatment and Care for an Ageing Population; Cancer Research UK: London, UK, 2018.
2. Khoury EG, Nuamek T, Heritage S, et al. Geriatric Oncology as an Unmet Workforce Training Need in the United Kingdom-A Narrative Review by the British Oncology Network for Undergraduate Societies (BONUS) and the International Society of Geriatric Oncology (SIOG) UK Country Group. Cancers (Basel). 2023;15(19):4782. Published 2023 Sep 28. doi:10.3390/cancers15194782

Personality disorders in youth: descriptive epidemiology and patient experience within services

Eleni Frisira, Kapil Sayal

Background

Personality disorders (PDs), the fourth leading mental health condition, typically emerge during adolescence, yet research remains disproportionately focused on adults, leaving gaps in early identification and developmentally tailored interventions. This mixed-methods project aims to (1) identify patient, educational, occupational and service- use factors of adolescents who later receive PD diagnoses, (2) identify predictors of diagnostic outcomes, and (3) explore stakeholder experiences of services.

Methods

Three studies will address these aims:

- A systematic review of educational and occupational outcomes in young people (YP) with PDs.
- A retrospective cohort study linking clinical data of 4644 YP with a PD diagnosis from a large mental health database, the Clinical Record Interactive Search, with educational data through the National Pupil Database, physical healthcare data through Hospital Episode Statistics, and occupational data through Department for Work and Pensions to profile trajectories and predictors.
- A qualitative study interviewing YP, parents/carers, and professionals across service contexts to identify barriers and solutions for care improvement.

Results

Findings will be synthesized with PPI/E input.

Conclusion

Conclusions from this research project will inform targeted pathways for young people with a personality disorder.

References

- GBD 2019 Mental Disorders Collaborators (2022). Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. The lancet. Psychiatry, 9(2), 137–150. https://doi.org/10.1016/S2215-0366(21)00395-3
- Chanen AM., Sharp C., Nicol K., Kaess M. (2022) Early intervention for personality disorder. FOCUS Am Psychiatr Publ. doi:10.1176/appi.focus.20220062
- Winsper C, Bilgin A, Thompson A, et al. (2020) The prevalence of personality disorders in the community: a global systematic review and meta-analysis. The British Journal of Psychiatry.216(2):69-78. doi:10.1192/bjp.2019.166

Accounting for NHS Trust when Assessing Risk Factors for Persistent Pain Following Elective Hip Replacement

Lawrence Gillam, Brett Doleman, John Williams

Background

Hip replacements are among the most performed elective operations within the NHS. They are primarily performed to improve patient's pain, functional status and quality of life. Yet, it is reported that between 7 – 23% suffer with chronic post-surgical pain(1).

There have been numerous studies identifying risk factors(2). However, to the authors knowledge a mixed effects logistic regression model has not been used to account for NHS trust. We present the results an analysis exploring factors associated with persistent pain after elective hip replacement using this approach.

Methods

We utilised patient reported outcome data published by NHS England following hip replacement from 2018 to 2024. Persistent pain after surgery was defined as severe or moderate pain in the post-operative survey at six months.

Initially a random forests analysis was used to highlight potential predictor variables for persistent pain after surgery. These were then inputted into a multilevel mixed logistic regression model with NHS trust as a cluster variable. We report an odds ratio and 95% confidence interval for these predictors. Statistical significance set as $P<0.05$.

Results

From 98,308 responses the overall prevalence of persistent pain after surgery was 17.2%, which does not significantly vary over time. Several potential predictor variables were highlighted on a random forests analysis: of which, NHS trust, preoperative pain, anxiety, living arrangement, ability to self-care and mobility were notable. The odds ratio of developing persistent pain after hip replacement in those with very mild, mild, moderate and severe preoperative pain = 0.72, 1.03, 1.59, 1.97, respectively, mild anxiety = 1.27, moderate anxiety = 1.69, live alone = 1.21, unable to wash and dress themselves = 1.28 (Table 1). There is a wide range of intercept values for each NHS trust.

Conclusion

We have been able to provide estimates for risk factors associated with persistent pain after hip replacement, whilst adjusting for NHS trust. This approach provides estimates that align with those within the literature. Furthermore, the variability between NHS trust intercepts in this work is evidence of inter-trust differences in the risk of pain after elective total hip replacement.

This work demonstrates the utility of multilevel modelling on routinely collected NHS data and highlights the potential of inter-trust differences that could be multifactorial. Further work will assess other risk factors and determine predictive characteristics.

References

1. Rosenberger DC, Pogatzki-Zahn EM. Chronic post-surgical pain - update on incidence, risk factors and preventive treatment options. BJA Educ. 2022;22(5):190-6.
2. Fernández-de-Las-Peñas C, Florencio LL, de-la-Llave-Rincón AI, Ortega-Santiago R, Cigarán-Méndez M, Fuensalida-Novo S, et al. Prognostic Factors for Postoperative Chronic Pain after Knee or Hip Replacement in Patients with Knee or Hip Osteoarthritis: An Umbrella Review. J Clin Med. 2023;12(20).
3. Schug SA, Lavand'homme P, Barke A, Korwisi B, Rief W, Treede RD, et al. The IASP classification of chronic pain for ICD-11: chronic postsurgical or posttraumatic pain. Pain. 2019;160(1):45-52.

Variable	Category	Odds Ratio	95% Confidence Interval	P Value
Preoperative Pain	No Pain	1		
	Very Mild	0.72	0.41 – 1.26	P = 0.250
	Mild	1.03	0.63 – 1.68	P = 0.913
	Moderate	1.59	0.99 – 2.56	P = 0.057
	Severe	1.97	1.23 – 3.18	P = 0.005
Anxiety	No Anxiety	1		
	Mild Anxiety	1.27	1.22 – 1.31	P < 0.001
	Moderate Anxiety	1.69	1.58 – 1.81	P < 0.001
Preoperative Living Arrangement	Live with partner/spouse/family/friend	1		
	I live alone	1.21	1.17 – 1.26	P < 0.001
	I live in a nursing home, hospital or other long-term care home	0.89	0.57 – 1.38	P = 0.596
	Other	1.16	0.90 – 1.49	P = 0.246
Preoperative Selfcare	I have no problem washing and dressing myself	1		
	I have some problems washing or dressing myself	1.04	1.00 – 1.08	P = 0.063
	I am unable to wash or dress myself	1.32	1.15 – 1.50	P<0.001
Preoperative Mobility	I have no problems in walking about	1		
	I have some problems in walking about	1.03	0.95 – 1.12	P = 0.444
	I am confined to bed	1.24	1.00 – 1.53	P = 0.050

Table-1: Summary of mixed effects logistic regression model showing odds ratio for each variable with its association with the development of persistent pain (moderate or severe pain reported in the 6-month post-operative survey). A 95% confidence interval and associated p-value are provided.

Incidence and survival of patients in England with angioimmunoblastic T-cell lymphoma: A population-based study using National Cancer Registration Data

Dr Sarah Halligan, Dr Matthew Grainge, Dr Mark Bishton

Background

Angioimmunoblastic T-cell lymphoma (AITL) is a rare, aggressive subtype of non-Hodgkin lymphoma arising from follicular T helper cells (1). It is typically a disease of older adults, with a median age of 65 years (2). Overall prognosis is poor, with a 5-year overall survival (OS) of 44% and 5-year progression-free survival of 32% (2,3). Currently, to our knowledge there are no large-scale English data describing epidemiology, therapies, the use of stem cell transplantation (SCT), and their impact on outcomes in AITL. National Cancer Registration and Analysis Service (NCRAS) data held by NHS-England will help describe these on a population level.

Methods

We will undertake a retrospective population-based study using ICD-coded cases of AITL in England. We will use NCRAS and linked datasets including hospital admissions, Systemic Anti-Cancer Therapy (SACT), comorbidities and death, and socio-demographics. We will identify cases from 1 January 2013 to 31 December 2019, with survival data up to 31st January 2021. We will describe baseline demographics, and calculate crude and adjusted incidence rate ratios to compare the incidence between groups. We will calculate OS using Kaplan-Meier methods, and fit a Cox proportional hazards regression model adjusted for age, sex, ethnicity, deprivation and SCT. We will describe delivered lines of therapy and analyse their impact on overall survival. Analysis will be undertaken using the statistical package R.

Results

The results for this project are not yet collected. There are over 1000 patients with AITL identified in the database, which would be a large series for this rare disease.

References

- Lunning M, Vose JM. Angioimmunoblastic T-cell lymphoma: the many-faced lymphoma. Blood [Internet]. 2017;129(9):1095–1102. Available from: https://ashpublications.org/blood/article/129/9/1095/36554/Angioimmunoblastic-T-cell-lymphoma-the-many-faced
- Advani R, Skrypets T, Federico M. Outcomes and prognostic factors in angioimmunoblastic T-cell lymphoma: final report from the international T-cell Project. Blood. 2021;138(3):213–220.
- Civarello M, Schroers-Martin J, Advani R. Long Term Outcome of Peripheral T Cell Lymphomas: 10-year Follow-Up of the International Prospective T Cell Project. Br J Haematol. 2024;205(1):166–174.

A vasculature niche orchestrates stromal cell phenotype through PDGF signaling: Importance in human fibrotic disease

Thomas Layton, Lynn Williams, Raguwinder Sahota, Jagdeep Nanchahal

University of Nottingham

Conclusion

These findings provide an important translational resource and highlight the therapeutic potential of targeting blood vessel signaling in human fibrosis.

Background

Fibrosis is characterized by excessive matrix protein accumulation and contributes to significant morbidity and mortality in the Western world. The relative lack of effective antifibrotic therapeutics for the majority of these conditions reflects the difficulty in identifying targets for human fibrosis. Animal models fail to recapitulate all of the facets of human disease, and the limited clinical samples from patients with fibrosis of visceral organs are usually of late-stage disease.

Methods

Here, we use Dupuytren's disease (DD), a localized fibrotic condition of the hand, as a model to profile the vasculature niche of human fibrosis at single-cell resolution.

Results

Our spatially resolved molecular taxonomy of fibrotic blood vessels identifies distinct endothelial and pericyte populations and demonstrates a complex topological organization in the fibrotic microenvironment. In developing fibrosis, we show that the endothelium acts to promote immune regulatory fibroblast phenotype through platelet-derived growth factor (PDGF) signaling, thereby sustaining an immune cell–enriched perivascular niche. Moreover, we highlight pericytes as "housing" a putative myofibroblast precursor in DD. Overall, our results elucidate a tightly coupled vasculature niche in fibrosis that instructs the differentiation of functionally distinct stromal cells.

Extended (28-days) chemical prophylaxis for venous thromboembolism in patients undergoing emergency colectomy for benign disease. A randomised pilot study protocol

Christopher Lewis-Lloyd, David Humes

Background

Patients undergoing colectomy for malignant disease receive 28-days (extended regimen) of chemical prophylaxis against venous thromboembolism (VTE) as per National Institute for Health and Care Excellence (NICE) guidance. Contemporary data shows postoperative VTE rates are higher in emergency benign compared to elective malignant colectomies. However, no guidance exists for benign colectomy patients despite the postoperative VTE risk being higher in patients undergoing emergency compared to elective colectomies, and most emergency resections for benign disease. Currently, no randomised clinical trial exists on this subject despite international interest in extended VTE prophylaxis following benign colectomies.

This study aims to address whether extended chemical prophylaxis compared to current NICE guidance reduces the VTE risk in patients undergoing emergency benign colectomy.

Methods

Prospective, multicentre, randomised, investigator-initiated, superiority, quadruple-blinded pilot study.
Population: Patients undergoing emergency colectomy (non-elective NCEPOD classifications codes 1-3) for benign pathology.
Intervention: 28-days of chemical VTE prophylaxis (subcutaneous low molecular weight heparin (LMWH)) post colectomy.
Comparison: Per NICE guidance, in-hospital chemical prophylaxis (subcutaneous LMWH) or up to 7 days, if discharged before 7 days, post colectomy.

Methods (continued)

All patients will receive in-hospital mechanical VTE prophylaxis with chemoprophylaxis starting the day of surgery.
Outcome: VTE either defined radiologically by active surveillance using duplex ultrasonography scanning at 30±4 days and 90±4 days postoperatively, or clinically as VTE related death or radiological evidence due to symptoms, either by duplex ultrasonography or computed tomography, by follow up in routinely collected data.

Results

With an assumed overall 20% loss to follow-up, 9% incidence rate in the control group and 65% reduction in VTE risk, 626 patients are needed to show a significant difference between study groups (two-sided 0.05, power 80%).

Conclusion

VTE is a key preventable cause of postoperative morbidity and mortality. This study would potentially change the management of colectomy patients and reduce VTE risk.

References

- Becattini C, Pace U, Pirozzi F, Donini A, Avruscio G, Rondelli F, et al. Rivaroxaban vs placebo for extended antithrombotic prophylaxis after laparoscopic surgery for colorectal cancer. Blood. 2022;140(8):900-8.
- Leow TW, Rashid A, Lewis-Lloyd CA, Crooks CJ, Humes DJ. Risk of Postoperative Venous Thromboembolism After Benign Colorectal Surgery: Systematic Review and Meta-analysis. Dis Colon Rectum. 2023;66(7):877-85.
- Lewis-Lloyd CA, Crooks CJ, West J, Peacock O, Humes DJ. Time trends in the incidence rates of venous thromboembolism following colorectal resection by indication and operative technique. Colorectal Dis. 2022;24(11):1405-15.
- Lewis-Lloyd CA, Humes DJ, West J, Peacock O, Crooks CJ. The Duration and Magnitude of Postdischarge Venous Thromboembolism Following Colectomy. Ann Surg. 2022;276(3):e177-e84.
- Lewis-Lloyd CA, Pettitt EM, Adiamah A, Crooks CJ, Humes DJ. Risk of Postoperative Venous Thromboembolism After Surgery for Colorectal Malignancy: A Systematic Review and Meta-analysis. Dis Colon Rectum. 2021;64(4):484-96.
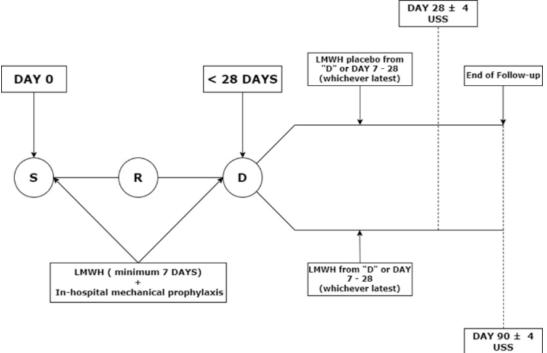
Figure 1: Study design flow chart

S = Emergency/ Unplanned colorectal resectional Surgery for benign pathology

LMWH = Low Molecular Weight Heparin

R = Recruitment and Randomisation

D = Discharge from hospital

USS – Venous Ultrasound Scan of lower limbs

Investigating the utility of Oxford Nanopore Technology for molecular diagnostics of melanocytic lesions in a clinically relevant context

Chrystle Mascarenhas, William Dalleywater, Somaia Elsheikh, Prof. Matt Loose

References

1. de la Fouchardiere A, Blokx W, van Kempen LC, Luzar B, Piperno-Neumann S, Puig S, et al. ESP, EORTC, and EURACAN Expert Opinion: practical recommendations for the pathological diagnosis and clinical management of intermediate melanocytic tumors and rare related melanoma variants. Virchows Archiv. 2021;479(1):3-11.
2. Marin-Acevedo JA, Harris DM, Burton MC. Immunotherapy-Induced Colitis: An Emerging Problem for the Hospitalist. Journal of Hospital Medicine. 2018;13(6):413-8.

Background

There is a heterogeneous group of intermediate melanocytic neoplasm called melanocytomas. Lack of reproducible morphological and molecular characterisation can lead to diagnostic over/undercalling (1,2). Our long-term aim is to develop a robust molecular classifier for melanocytic lesions to enable better decisions to be made by the multi-disciplinary team.

Methods

Few studies have investigated whether FFPE followed very shortly afterwards by extracting DNA for genetic analysis may represent a viable pathway for highly multiplexed genomic and epigenetic analysis. Fig.1 shows two case vignettes.
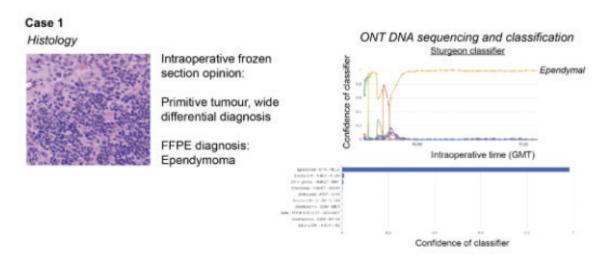
We will use melanoma cell-lines as a source of DNA for analysis. We will perform genome sequencing and methylation profiling on ONT. We will fix cells in formalin and form a cellblock in agarose from the cells. The cellblock will be processed, and paraffin embedded. On the same day, scroll sections will be taken and dewaxed prior to DNA extraction. Extracted DNA will be sequenced as above (n=2/cell-line). This will be repeated after 1 week to ascertain whether a short period in storage is associated with alterations.
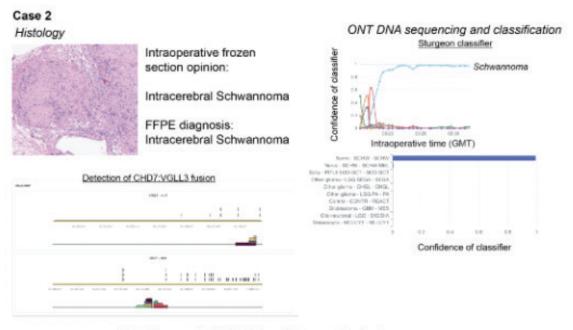
Conclusion

This study represents a significant enabling project in progressing ONT towards utility in classifying melanocytic tumours.

Fig. 1: Case vignettes from Oxford Nanopore Technologies sequencing of brain tumours demonstrate ability to classify tumours rapidly and with a high degree of confidence. Left-hand images show haematoxylin and eosin stained section of tumours, while right-hand images show realtime classification of tumour by sequencing, in both cases achieving near 100% classifier confidence in approximately 15 minutes. In case 2, specific high-depth sequencing of the CHD7/VGLL3 gene loci demonstrated a specific fusion event between the two genes.

Case 1
Histology

Intraoperative frozen section opinion:

Primitive tumour, wide differential diagnosis

FFPE diagnosis: Ependymoma

ONT DNA sequencing and classification
Sturgeon classifier

Ependymal

Confidence of classifier

Intraoperative time (GMT)

Confidence of classifier

Final diagnosis: ZFTA-fused supratentorial ependymoma

Case 2
Histology

Intraoperative frozen section opinion:

Intracerebral Schwannoma

FFPE diagnosis: Intracerebral Schwannoma

ONT DNA sequencing and classification
Sturgeon classifier

Schwannoma

Confidence of classifier

Intraoperative time (GMT)

Confidence of classifier

Detection of CHD7-VGLL3 fusion

Final diagnosis: VGLL3-fused intracerebral schwannoma

Comparison of recruitment to an RCT via online advertising and face-to-face methods: secondary analysis of SNAP2 trial data

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Background

Recruitment challenges in randomised controlled trials (RCTs) can significantly impact study validity, statistical power, and resource efficiency. A review by the UK's National Institute for Health Research (NIHR) found that only 56% of RCTs met their recruitment targets, leading to concerns about study feasibility and potential bias. Traditional recruitment methods, such as face-to-face engagement in clinical settings, may differ in effectiveness compared to digital approaches, such as social media advertising. Understanding these differences is essential to optimise recruitment strategies for future trials.

Aim

This study aims to compare the characteristics and engagement levels of participants recruited via social media advertising versus face-to-face methods in the SNAP2 trial.

Design and setting

This observational study will conduct a secondary analysis of a sub-sample of data collected from the SNAP2 trial, which assesses the effectiveness of an intervention aimed at promoting smoking cessation among pregnant women through better adherence to Nicotine Replacement Therapy (NRT).

Method

Sociodemographic, gestational, and behavioural characteristics of participants recruited through social media will be compared with those recruited in clinical settings. Engagement levels, including study retention and adherence to intervention protocols, will be assessed. Statistical analyses will be conducted using SPSS to identify potential differences between recruitment strategies.

Conclusion

Findings from this study will provide valuable insights into the effectiveness of social media as a recruitment tool for RCTs, contributing to the external validity and informing best practices for future trial designs. Understanding these differences may improve recruitment efficiency, enhance study generalisability, and contribute to evidence-based recommendations for digital recruitment in clinical research.

Keywords

Recruitment, social media, randomised controlled trial, smoking cessation, primary health care, pregnancy, Nicotine Replacement Therapy.

Demonstration of differences between pediatric and adult respiratory morphology observed using a handheld capnography device

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2. Nottingham University NHS Hospitals Trust
3. TidalSense Limited, Cambridge, UK
4. Modality GP Partnership, UK

Background

Lung development in children is a multi-step process beginning before birth and continuing into adolescence. Heterogenous airway enlargement following birth leads to changes in airflow dynamics and increased childhood susceptibility to obstructive airway disease. Waveform capnography is a method of assessing lung function by measuring the concentration over time of expired CO2.

Here we aimed to investigate the airflow dynamics of preschool children compared to adults using capnographic waveform morphology collected using an N-TidalTM handheld capnometer.

Methods

25 Healthy children produced capnographs using the N-TidalTM handheld capnometer. These capnograms were then compared to previously produced capnograms from a previous longitudinal observational study and correlation between the mathematical parameters (angles, durations and gradients) of the capnogram were calculated.

Results

Healthy paediatric waveforms showed a significantly shallower expiratory upstroke and obtuse alpha angle region when compared with healthy adult waveforms. This area of the waveform represents the transition between anatomical dead space and CO2-rich alveolar gas. (See Figure 1 on next page)

Conclusion

Healthy children were shown to exhibit a differential waveform morphology compared with healthy adults. These results suggest that changes in the capnograph waveform are produced by differences in airflow from the developing bronchial tree and could demonstrate changes in airflow dynamics that occur with heterogeneity of airway caliber. These changes further illustrate how changes in airway diameter, such as occurs in acute asthma, can have a significant impact on airflow in children.
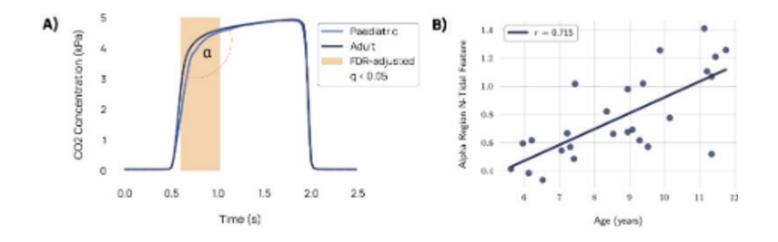
Figure 1: A) Overlaid images of the adult and paediatric capnogram. B) Scatterplot showing correlation between age and the alpha region of the capnogram.

Timing of cessation of Mothers' Own Milk (MOM) feeding in preterm infants

Melissa Ryan, Lisa Szatkowski, Sha Tao, & Shalini Ohja

Background

Breast milk has significant benefits for preterm infants in reducing mortality, rates of NEC, and late onset sepsis[1]. Sadly there are very low rates of exclusive MOM feeding in neonatal units in England and Wales[2]. Rates drop from 52% on day 14 since birth to 34.7% at discharge, with a greater drop for the more preterm infants[2]. We do not know when this drop occurs during admission.

Methods

We performed a retrospective cohort analysis using data from the National Neonatal Research Database (NNRD for infants born at 22-33 weeks' gestational age (GA) in England and Wales from 01 January 2016 to 31 December 2022.

We determined the proportion of these infants that were receiving MOM feed at D14 and discharge and the first day since birth that formula or mixed feeding was introduced, by GA group.

We established the feed type of these infants every 7 days thereafter to track the proportion still receiving MOM until discharge or the end of the dataset (day 203 since birth).

Results

In infants exclusive MOM feeding on D14, formula was introduced in the latter third of neonatal stay (median 16 days prior to discharge IQR 5-35, with a median length of stay of 42 days (IQR:26-62)), but earlier for the most preterm infants (median day 37 (IQR 14-67) with a median length of stay of 120 days (IQR:101-141)).

Compared to late and moderate preterm infants, the most premature have a greater proportion of infants with introduced formula feeds earlier on in their admission (Figure 1).

Conclusion

The most premature infants in neonatal care in England and Wales are more likely to switch to formula feeds earlier in their stay compared to more mature preterms. We need to develop strategies to support mothers of these infants in MOM feeding while in our neonatal care.

References

1. Parker M et al. Promoting Human Milk and Breastfeeding for the Very Low Birth Weight Infant. Pediatrics 2021;148:e2021054272
2. Ryan M, Szatkowski L, Doubatty A, et al. Association between maternal sociodemographic characteristics and exclusive mother's own milk feeding in preterm infants: a cohort study using data from the National Neonatal Research Database. Archives of Disease in Childhood - Fetal and Neonatal Edition Published Online First: 26 February 2025. doi: 10.1136/archdischild-2024-327990
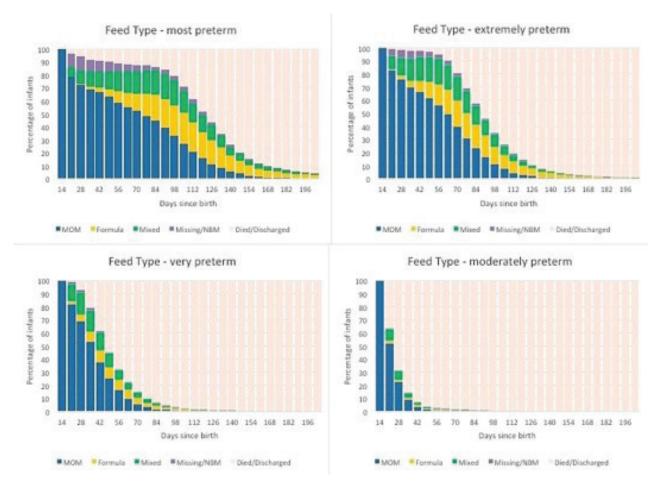
Figure 1: A) Overlaid images of the adult and paediatric capnogram. B) Scatterplot showing correlation between age and the alpha region of the capnogram.

Exploring Barriers and facilitators to Implementation of Repetitive Transcranial Magnetic Stimulation (rTMS) in the UK

Professor Richard Morriss: Chief Investigator
Dr Suranjana Senanayake

Background

Repetitive Transcranial Magnetic Stimulation is a NICE recommended treatment for treatment resistant depression. However, uptake of this therapeutic technique has been slow and only a minority of the NHS Trusts in the UK provide this service. (Hakan Yonel, 2020)

Primary objective: The primary objective of this study is to explore the barriers and facilitators to implementing repetitive Transcranial Magnetic Stimulation (rTMS) for Treatment resistant depression consistently across the National Health System (NHS), UK.

Secondary objectives:

1. Determine any regional disparities in relation to barriers and facilitators to rTMS implementation.
2. Determine whether views on barriers to implementation vary by sociodemographic characteristics of respondents.

Method

Study configuration: Qualitative study including an online survey and online one to one interviews

Setting: Recruitment to the online survey and interviews will be from secondary care mental health services via the Royal College of Psychiatrists. Snowballing techniques will be encouraged. The survey and the interviews will be conducted remotely by a researcher based at the Institute of Mental Health, University of Nottingham.

Sample size estimate:
Survey Participants: the survey will be sent to 200-250 Consultant Psychiatrists with experience in delivering or leading ECT and Neuromodulation services in the NHS.
One to one Interviews with Consultant Psychiatrists = 20-30 participants

Number of participants:
Phase 1:
Survey participants:

The nationwide survey in Phase I of the study will be sent to 200-250 Consultant Psychiatrists in charge of ECT and neuromodulation services in NHS Trusts in the UK ideally covering every NHS Trust in the UK.

Phase II:
One-to-one Interviews:

Interviews will be conducted with 20-30 Consultant Psychiatrist which experience in delivering or leading Neuromodulation services in NHS Trusts.

Eligibility criteria:
Survey participants:
Inclusion criteria: Consultant psychiatrists with experience in delivering or leading neuromodulation services in the NHS.

Interview participants:
Inclusion criteria: Consultant psychiatrists with experience in delivering or leading neuromodulation services in the NHS.

Exploring Barriers and facilitators to Implementation of Repetitive Transcranial Magnetic Stimulation (rTMS) in the UK

Professor Richard Morriss: Chief Investigator
Dr Suranjana Senanayake

Results

The study protocol is currently being developed and results have not yet been obtained.

References

Hakan Yonel, M. A. (2020). Knowledge and attitude towards TMS: a brief educational intervention. Progress in Neurology and Psychiatry.

Method (continued)

Description of interventions:

Phase I of the study will consist of a nationwide survey which will be completed by Consultant Psychiatrist with experience in delivering or leading neuromodulation services in the NHS to gather information on the current TMS service provision in the NHS. This will be an online survey self-administered via Google Forms. The survey will be developed with insights gained via individual and group discussions with Clinical Academics and Consultant Psychiatrists.

In phase II of the study, 30–60-minute Semi structured one to one interviews will be carried out with 20- 30 key informants to gain an in-depth understanding of the barriers and facilitators to more widespread implementation of rTMS in the NHS. Interviews will be carried out via Microsoft Teams. The interviews will be audio and video recorded.

Study duration:
The study duration will be 18 months. Participant recruitment will occur during a 12-month time window. We would anticipate participants participating in the interviews within 2-3 weeks from consent, but a maximum window is not specified.

Methods of analysis:
Categorical, Likert and numerical data will be descriptively analysed.

The qualitative data collected via interviews and free-text responses in the survey will be analysed using reflexive thematic analysis carried out using NVIVO software.

The Role of Proline Metabolism in Paediatric Ependymoma

Senali Y Seneviratne, Bhoomi Shastri, Madhumita Dandapani

Background

Ependymoma is a common intracranial malignancy in children and has poor progression-free survival, particularly in the case of disease recurrence.[1] Proline metabolism is rewired in malignancy and this is hypothesised to contribute to the proliferation of cancer cells.[2] The pyrroline-5-carboxylate reductase (PYCR) enzyme, which has three isoforms, catalyses the final step in the proline synthesis pathway and is coded for by the PYCR gene, a potential oncogene.[3] Proline dehydrogenase (PRODH) catalyses the first step in proline catabolism and the PRODH gene acts as a potential tumour suppressor.[3]

Aims

To investigate the role of PYCR1 and PRODH in paediatric ependymoma.

Methods

We plan to statistically analyse data on the R2 genomics analysis and visualisation platform to evaluate the expression of PYCR1, PYCR2 and PRODH across datasets, comparing ependymomas to normal brain and other tumours such as medulloblastomas and gliomas. Additional analyses include survival data, creating Kaplan-Meier curves on ependymoma datasets based on levels of PYCR1, PYCR2 and PRODH expression.

Methods (continued)

We plan to undertake immunohistochemical staining of Ependymoma tumour tissue to identify differential expression of PYCR1, PYCR2 and PRODH. We hypothesise that PYCR1 and/or PYCR2 may be highly expressed and PRODH may have reduced expression in ependymoma tissue, compared to normal brain tissue.

We aim to then evaluate the effect of gene inhibition in ependymoma cell lines. We hypothesise that inhibition of PYCR1, a potential oncogene, using the specific PYCR1 IN1 inhibitor, may have an adverse effect on cell survival in vitro.

Results

Results to follow.

References

1. Hwang EI, Hanson D, Filbin MG, Mack SC. Why haven't we solved intracranial pediatric ependymoma? Current questions and barriers to treatment advances. Neoplasia. 2023; 39: 100895.
2. Tanner JJ, Fendt SM, Becker DF. The Proline Cycle As a Potential Cancer Therapy Target. Biochemistry. 2018; 57(25): 3433.
3. Burke L, Guterman I, Palacios Gallego R, Britton RG, Burschowsky D, Tufarelli C et al. The Janus-like role of proline metabolism in cancer. Cell death Discov. 2020; 6(1).

Magnetoencephalography with optically pumped magnetometers (OPM-MEG) in Alzheimer's Disease

Priya Sharma, Rob Seymour, Lindsey Eriamietor, Inra Tu, Lauren Gascoyne, James Leggett, Clarise Castleman, Christopher Gilmartin, Peter Sellars, Matthew Brookes, Mark Woolrich, Nikos Evangelou

Background

Dementia is estimated to affect nearly one million people in the UK, with Alzheimer's disease (AD) being the leading cause[1]. There is, therefore, a growing need for both effective disease-modifying treatments and reliable biomarkers to monitor disease progression and therapeutic response.

Magnetoencephalography (MEG) is a non-invasive neuroimaging technique that measures magnetic fields generated by neuronal electrical activity, offering high temporal and good spatial resolution for assessing neural dynamics. Optically pumped magnetometer (OPM)-MEG is an emerging, wearable form of MEG that allows for improved signal sensitivity and spatial resolution[2].

Methods

This study investigates the potential of OPM-MEG to detect differences in neuronal activity between individuals with AD and healthy controls, with the goal of identifying a neuroimaging biomarker for AD monitoring. The study will recruit 20 participants with amyloid-positive mild cognitive impairment or early-stage AD, and 20 age-matched healthy controls. Each participant will undergo OPM-MEG whilst performing a battery of tasks: eyes-open resting-state, eyes-closed resting-state, movie watching and an auditory oddball task. Data analysis will focus on neural power, neural connectivity, consistency of neural activity, as well as oddball mismatched response.

Results

Data collection and analysis are currently ongoing.

References

1. Wittenberg R, Hu B, Jagger C, Kingston A, Knapp M, Comas-Herrera A, et al. Projections of care for older people with dementia in England: 2015 to 2040. Age Ageing. 2020 Feb 27;49(2):264–9. Available from: https://pubmed.ncbi.nlm.nih.gov/31808792/
2. Brookes MJ, Leggett J, Rea M, Hill RM, Holmes N, Boto E, et al. Magnetoencephalography with optically pumped magnetometers (OPM-MEG): the next generation of functional neuroimaging. Trends Neurosci. 2022 Aug 1;45(8):621–34.

Specialised Foundation Programme Doctors' Posters

Large dataset performance of logistic regression model for diffuse glioma genotyping

Yousif Aldabbagh, Faheem Bhatti, Nitin Menon, Paul Morgan, John Maynard, Simon Paine, Stuart Smith, Stefanie C. Thust

Background

Glioblastoma (GBM) is an aggressive WHO Grade 4 IDH-wildtype (IDHwt) diffuse glioma with poor prognosis—even in early WHO grade 2–3 stages [1]. Accurate early identification is essential, as timely maximal resection improves outcomes [2]. We previously developed a multivariable MRI model to predict IDH status [3]. This study validates the model in a large cohort and compares expert vs. trainee radiologist performance using the model.

Methods

Patients eligible were diagnosed with diffuse gliomas at Nottingham (11/2013–09/2024), with pre-treatment MRI and confirmed IDH and 1p19q status. Two blinded observers assessed tumour morphology (enhancement, location, cysts, calcification) and measured ADC to calculate a ratio (rADCmean). Along with age, this informed logistic models: Model A (no calcium) and Model B (no cysts). Observer predictions alone, and with model outputs, were compared to histology. Analysis was conducted in Python.

Results

Of 1708 eligible cases, 688 MRIs (mean age 56.79 ± 15.33) were analysed; 24.3% had WHO grade 2–3 histology. 511 were IDHwt, 177 IDHmut. For the expert rater, Models A and B identified GBM with 97.3% and 95.9% sensitivity, 81.4% and 83.1% specificity, 93.2% and 92.6% accuracy, and AUC of 0.96. This represented a 1.4% gain in sensitivity and 0.3% gain in accuracy over guessing alone. For the trainee, Model A and B showed 97.6% and 96.5% sensitivity, 47.8% and 73.9% specificity, 87% and 91.7% accuracy, and AUC of 0.93 and 0.94. Models increased trainee sensitivity by 10.5% and accuracy by 7.4%. rADCmean interclass correlation coefficient ranged from 0.79–0.88 (n=108, P<0.001). Morphological feature reproducibility (kappa) showed 'substantial' to 'almost perfect' agreement, except for calcium.

Conclusion

Our model accurately predicts IDH status in diffuse gliomas, with strong performance across experience levels and high reproducibility. Its simplicity, speed, and PACS compatibility make it a practical tool for early glioma stratification, enabling faster clinical decision-making prior to molecular confirmation.

References

1. Körber V, Yang J, Barah P, Wu Y, Stichel D, Gu Z, et al. Evolutionary Trajectories of IDHWT Glioblastomas Reveal a Common Path of Early Tumorigenesis Instigated Years ahead of Initial Diagnosis. Cancer Cell. 2019 Apr 15;35(4):692-704.e12
2. Kawauchi D, Ohno M, Miyakita Y, Takahashi M, Yanagisawa S, Omura T, et al. Early Diagnosis and Surgical Intervention Within 3 Weeks From Symptom Onset Are Associated With Prolonged Survival of Patients With Glioblastoma. Neurosurgery. 2022 Nov;91(5):741.
3. Maynard J, Okuchi S, Wastling S, Busaidi AA, Almossawi O, Mbatha W, et al. World Health Organization Grade II/III Glioma Molecular Status: Prediction by MRI Morphologic Features and Apparent Diffusion Coefficient. Radiology. 2020 Jul;296(1):111–21

Optimising neuromodulation for the treatment of anxiety and depression

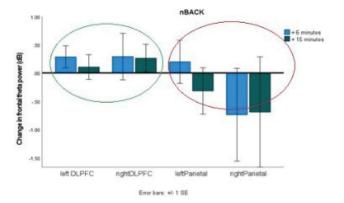Alexander Axford, Lucy Webster, Paul M Briley

Background

Transcranial alternating current stimulation (tACS) is a non-invasive neuromodulation technique holding potential for the treatment of anxiety and depression. An oscillating waveform, delivered between scalp electrodes, mimics and modulates natural brain oscillatory activity. Its effect on frontal theta brain oscillations (4-8 Hz) is of particular interest due to this frequency's association with the antidepressant effects of neuromodulation (1, 2). This study investigates whether tACS stimulation over a particular brain region results in a greater increase in frontal theta power during a memory task and aims to inform the optimisation of subsequent therapeutic protocols.

Methods

Healthy participants underwent four stimulation sessions at least 72 hours apart, each session comprising ten minutes of 5 Hz tACS stimulation to one of four brain regions: right dorsolateral prefrontal cortex (DLPFC), left DLPFC, right posterior parietal cortex, and left posterior parietal cortex. Session order was randomised across participants. Theta oscillations were recorded with electroencephalography (EEG) at rest and during an n-back working memory task before and after ten minutes of tACS stimulation.

Results

Six participants to date have completed all four sessions. An increase in frontal theta power during the n-back task was observed six minutes after stimulation to the left and right DLPFC regions. This began to drop off by 15 minutes after stimulation. There was an associated improvement in working memory for the same regions. Generally, a decrease in frontal theta power was observed following right and left parietal stimulation (except for one individual who showed an increase following left parietal tACS).

Conclusion

Although only a small number of participants have completed all four sessions, these preliminary results suggest stimulation to the left and right DLPFC regions result in the greatest increase in frontal theta power with associated improvement in working memory.

References

1. Bailey et al. (2018). Responders to rTMS for depression show increased fronto-midline theta and theta connectivity compared to non-responders. Brain Stimulation, 11(1), 190–203. https://doi.org/10.1016/j.brs.2017.10.015

2. Briley et al. (2024). Intermittent theta burst stimulation with synchronised transcranial alternating current stimulation leads to enhanced frontal theta oscillations and a positive shift in emotional bias. Imaging Neuroscience, 2, Article 73. https://doi.org/10.1162/imag_a_00073

Assessing the impact of intraoperative diathermy on accuracy and functioning of glucose monitoring systems

Dr Aneeha Bajpai, Dr Emma Wilmot, Dr James Armstrong, Professor Helen Budge, Dr James Law

Background

The incidence of type 1 diabetes mellitus (T1DM) is rising[1], and technology is an increasingly important part of its management. Continuous glucose monitoring (CGM) systems provide real-time data on patients' glucose levels, even allowing some pumps to adjust insulin automatically. They allow enhanced monitoring and improve long-term patient outcomes.[2] CGM systems are now the standard of care in T1DM in children, young people, and adults in England.[3]

Many surgeries use diathermy to control bleeding with high-frequency electrical energy. The impact on the accuracy of CGM systems remains unclear but with an indication that systems may not be affected.[4] This study will assess the impact of diathermy on CGM accuracy in patients with T1DM.

Methods

I will undertake a single-centre observational study of 126 participants with T1DM, aged 4 or older, who routinely use an Abbott Libre-2, Abbott Libre-3, Dexcom G6 or Dexcom G7 (29 for each) and have planned elective surgery at Nottingham University Hospitals NHS Trust. Twelve paired glucometer and sensor glucose measurements will be recorded every 45+/-30 minutes from up to 4 hours before surgery until up to 4 hours after surgery. Two venous blood samples will also be taken, one before and one after diathermy.

Results

The study will assess whether the Absolute Relative Difference (ARD) of each system changes after diathermy. An ANOVA mixed effects model will be applied. An equivalence F-test with an ARD equivalence value of 0.05 will be used to determine the effect of diathermy on ARD.[5]

Conclusion

Demonstrating CGM systems can be used safely during surgery would provide the anaesthetic team convenient and accurate data of glucose trends and reduce the need to take finger-prick capillary glucose tests or access venous/arterial lines. Real-time data on glucose trends would lead to better control of glucose levels peri-operatively and improve patient experience.

References

1. Gregory, G.A., Robinson, T.I.G., Linklater, S.E., et al. (2022). Global incidence, prevalence, and Mortality of Type 1 Diabetes in 2021 with Projection to 2040: a Modelling Study. The Lancet Diabetes & Endocrinology, [online] 10(10), pp.741–760. DOI: 10.1016/S2213-8587(22)00218-2.

2. Manov, A.E., Chauhan, S., Dhillon, G., et al. (2023). The Effectiveness of Continuous Glucose Monitoring Devices in Managing Uncontrolled Diabetes Mellitus: A Retrospective Study. Cureus, [online] 15(7). DOI: 10.7759/cureus.42545.

3. NICE (2022). Overview | Diabetes (type 1 and type 2) in children and young people: diagnosis and management | Guidance | NICE. [online] Nice.org.uk. Available at: https://www.nice.org.uk/guidance/ng18. Date Accessed: 05/04/2025

4. Kriventsov, S., Lindsey, A. and Hayeri, A. (2020). The Diabits App for Smartphone-Assisted Predictive Monitoring of Glycemia in Patients With Diabetes: Retrospective Observational Study. JMIR Diabetes, 5(3), p.e18660. DOI: 10.2196/18660.

5. Campbell, H.F. and Daniël Lakens (2020). Can we disregard the whole model? Omnibus non-inferiority testing for R^2 in multi-variable linear regression and in ANOVA. British Journal of Mathematical and Statistical Psychology, 74(1), pp.64–89. DOI: 10.1111/bmsp.12201.

Creating bacterial strains to help determine the effect of corticosteroids on quorum sensing in Pseudomonas aeruginosa

E Bearblock, E Jordana-Lluch, K Hardie, S Heeb

Background

Dr Jordana-Lluch has shown that corticosteroids, used frequently in the treatment of respiratory diseases, promote biofilm formation in P. aeruginosa (1). Biofilms are associated with chronic infection (2). Biofilm formation in this pathogen is regulated by three quorum sensing pathways. Corticosteroid treatment of mutants unable to synthesise Quorum Sensing Signalling Molecules (QSSMs) do not show an increase in biofilm biomass leading to the hypothesis that a QSSMs are implicated in mediating this phenotype (3).

Methods

We constructed luciferase reporter genes fused to the promoter genes that are required to synthesize the QSSMs. The production of these molecules can be monitored indirectly by quantifying the light emitted using a plate reader.

For each of the 3 QS pathways, we built two types of reporter strains: wild type strains that were able to produce the QSSMs and mutants that were unable to produce the QSSMs. The mutants can then be chemically complemented to determine at which concentration of signalling molecules responsiveness to corticosteroids is restored.

Results

After the first attempt at conjugation two of the mutant strains (PAO1LΔpqsAPpqsA:lux, PAO1LΔLasIPlasI:lux) produced bioluminescence at an intensity equal to or greater than their wild type counterparts even in the absence of exogenous QSSMs. It is a known phenomenon that the lux system used can become spontaneously more active after conjugation. As such the conjugation process was repeated for these two pairs. We successfully created the following pairs:

PAO1Lwt PlasI::Lux,   PAO1LΔlasI Plas:lux
PAO1Lwt PrhlI:lux,   PAO1LΔrhlIPrhlI:lux
PAO1Lwt PpqsA:lux, PAO1LΔpqsA PpqsA:lux

Conclusion

By the end of the experiment, we had generated three recombinant pairs such that there was a wild type and knockout strain for each QSSM. The knockout strains showed a dose-dependent response to the addition of exogenous QSSMs. These strains will be used to determine the effect of corticosteroids on the dose-dependent response of the knockout strains to QSSMs.

References

1. E. Jordana-Lluch, M. Escobar-Salom, C. Camps-Munar, C. López-Causapé, A. Iglesias, E. Rojo-Molinero, I.M. Barceló, B. G. Cosio, C. Juan, A. Oliver. (2022) Modulation of Pseudomonas aeruginosa biofilm by corticosteroids in Chronic Obstructive Pulmonary Disease context. EuroBiofilms 31st August-3d September, Palma de Mallorca (Spain)
2. Thi MTT, Wibowo D, Rehm BHA. Pseudomonas aeruginosa Biofilms. Int J Mol Sci. 2020 Nov 17;21(22):8671. doi: 10.3390/ijms21228671. PMID: 33212950; PMCID: PMC7698413.
3. Jordana-Lluch E, Escobar-Salom M, Iglesias A, Barceló IM, Cosio BG, Juan C, et al. Corticosteroids modulate biofilm formation in Pseudomonas aeruginosa. XXVI Conference of the Spanish Society of Infectious Diseases and Clinical Microbiology (SEIMC). Santiago de Compostela (Spain), 1-3 June 2023.
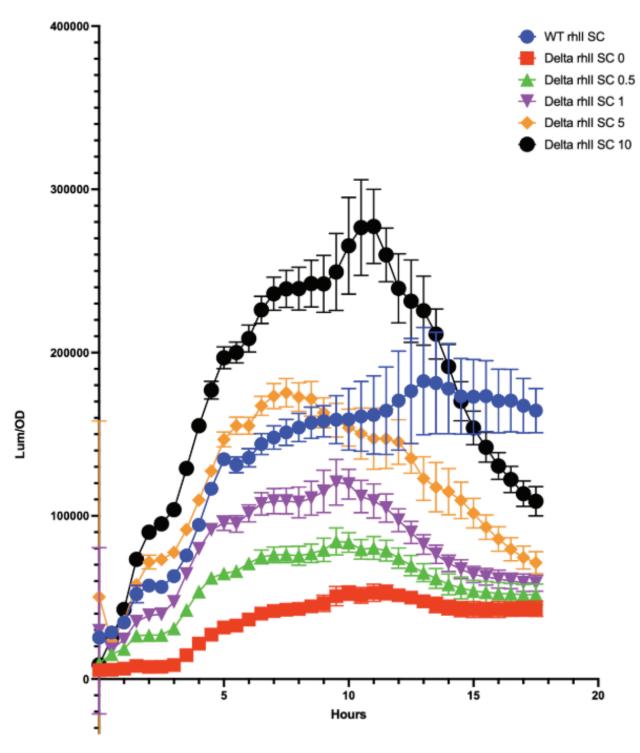
Figure 1: Example of experiment using these strains showing a dose dependant response in quorum sensing activity as measured by Lum/OD with increasing concentrations of QSSMs.

Evaluating expression of P-AKT, H3K27me3 and copy number changes in paediatric ependymoma: A Biological Markers of Ependymoma in Childhood and Adolescence (BIOMECA) study

C Brewer, T Ritzmann, R Chapman

Background

Paediatric ependymoma remains a clinical management challenge with limited adjuvant therapies, potentially devastating treatment sequalae and poor prognosis[1]. The World Health Organisation defines ependymoma by histopathology alongside molecular and anatomical features[2]. Phosphoinositide 3-kinase pathway dysregulation shows association with cancer pathogenesis and activation can be visualised with immunohistochemistry (IHC) using phosphorylated AKT (P-AKT)[3,4]. Trimethylated histone (H3K27me3) loss is a surrogate marker for poor prognosis and high-risk copy number changes present in disease recurrence[5]. The aim of this study was to examine the expression of biomarkers in paediatric and adolescent ependymoma.

Methods

Stained slides were scored for P-AKT: 0=negative, 1=positive cytoplasmic/nuclear or 2=positive intense nuclear/cytoplasm staining. Ilumina EPIC 850K methylation array (MA) identified molecular subtype, high-risk chromosomal copy number changes (1 and 6) and cyclin dependent kinase inhibitor 2A (CDKN2A) alterations. IHC identified loss or retention of H3K27me3. Statistical analysis was via Chi-square testing and calculation of Pearson correlation coefficients.

Results

Eighty-eight UK ependymoma samples were included. Median age at diagnosis was 3.2 years; 48 participants were male and 40 were female. MA identified high risk indicators in 16 cases: 1q gain in 12.5%, 6q loss/partial loss in 9.1% and both in 3.4%. CDKN2A loss occurred in ZFTA subtype only. PFA tumours accounted for 92% of H3K27me3 loss across the cohort (p=0.0001; n=81). P-AKT positivity was seen in 71.6% (infratentorial, n=49; spinal, n=5; supratentorial, n=9; p=0.4962). Both H3K27me3 and P-AKT and, high risk indicators and P-AKT, weakly correlated however neither were significant (r=0.06483; p=0.970; n=81 and r=0.1187; p=0.271; n=88 respectively).

Conclusion

Results support existing literature on H3K27me3 loss in PFA ependymoma subtype, and the proportion of samples expressing P-AKT is aligned with previous findings4,5. This consistency suggests both markers present potential roles in diagnosis of ependymoma. The role of P-AKT in chromosomal instability, copy number changes and prognostication in ependymoma remains an area for further investigation.

References

1. Chapman, R. J. et al. Optimizing biomarkers for accurate ependymoma diagnosis, prognostication, and stratification within International Clinical Trials: A BIOMECA study. Neuro Oncol 25, 1871–1882 (2023).
2. Louis, D. N. et al. The 2021 WHO Classification of Tumors of the Central Nervous System: a summary. Neuro Oncol 23, 1231–1251 (2021).
3. Mishra, R., Patel, H., Alanazi, S., Kilroy, M. K. & Garrett, J. T. PI3K Inhibitors in Cancer: Clinical Implications and Adverse Effects. Int J Mol Sci 22, (2021).
4. Rogers, H. A. et al. PI3K Pathway Activation Provides a Novel Therapeutic Target for Pediatric Ependymoma and Is an Independent Marker of Progression-Free Survival. Clinical Cancer Research 19, 6450–6460 (2013).
5. Ritzmann, T. A. et al. SIOP Ependymoma I: Final results, long-term follow-up, and molecular analysis of the trial cohort-A BIOMECA Consortium Study. Neuro Oncol 24, 936–948 (2022).

Additional Table

Demographic Variable		Number of Participants (*n=88*) from 18 UK centres
Gender	Male	48
	Female	40
Age (years)	Mean	5.5
	Median	3.2
	Range	0.5-18.0
Site	ST	13
	IT	66
	SP	9
DNA Methylation Analysis	PFA	59
	ZFTA	10
	PFB	5
	MYXO	4
	MPE	4
	NC	1
	Not defined/No match^	5
1q MA	Gain	11
	No Gain	77
6q MA	Loss	7
	No Loss	80
	Not recorded	1
CDKN2A MA	Gain	1
	Loss	7
	No change	80
H3K27me3 IHC	Loss	60
	Retained	19
	Equivocal	2
	Not recorded	7
P-AKT IHC^^	0	25
	1	56
	2	7

^includes LGG/PATZ1 (n=1) PLAGL1 (n=1)

^^P-AKT IHC Scoring 0 = negative; 1 = cytoplasmic and/or nuclear staining; 2 = widespread/intense cytoplasmic and/or nuclear staining

Abbreviations: ST – supratentorial, IT – Infratentorial, SP – Spinal

Predicting reductions in acute pain and opioid consumption with non-opioid analgesics: a machine learning analysis of randomised controlled trials (OPERA study)

Doleman B, Benaichouche M, Douzenis P, Daramola T

Background

Chronic post-surgical pain (CPSP) is one of the most common complications following surgery, and has a detrimental effect on patients' quality of life. It also poses significant healthcare and economic burdens 1. According to the James Lind Alliance, research on chronic surgical pain has been ranked the 11th highest priority for anaesthetic specialties 2. The role non-opioids play in managing post-surgical pain is increasing, either as a sole agent or in combination with other analgesics 3. Advances in machine learning (ML) presents opportunities to use data from randomised controlled trials in developing algorithms that can enhance treatment recommendations 4. This study is part of a wider systematic review and network meta-analysis, and aims to use machine learning to develop an algorithm that aims to predict reductions in acute pain and opioid consumption with non-opioid analgesics.

Methods

Studies in adult patients undergoing a surgical procedure wither under general or regional anaesthesia, were included. Other procedures, dental surgery and ophthalmic procedures were excluded.

For interventions, the studies included evaluated non-opioid analgesia (especially analgesia commonly used in the management of acute pain i.e., paracetamol, NSAIDs, pregabalin/gabapentin, alpha-2 agonists, ketamine, nefopam, anti-depressants, steroids, cannabinoids and magnesium). Agents that were commonly classified as opioids (e.g., tramadol) were not included. Moreover, studies that gave interventions to treat acute pain, used the analgesic in a patient controlled device, or had interventions that were given at the end of the surgery were excluded.

Methods (continued)

Data extraction
The risk of bias in the included studies was assessed using the Cochrane risk of bias tool Version 2. This was done by two study authors, and if consensus could not be reached a third study author was consulted. The risk of bias was assessed at the study level, instead of each numerical value to ensure that the study was feasible.

Outcomes
Postoperative opioids were converted to intra-venous morphine equivalents using set conversion ratios. For adverse events, if there were multiple timepoints recorded, the timepoint closest to 24 hours if reported cumulatively or the earliest timepoint if follow up times were similar. For serious adverse events, outcomes were included if the event was a known adverse event of the medication and met ICH definition. Mortality was not included as a SAE as this could be attributable to surgical factors.

Results and Conclusion

TBC

References

1. Rosenberger DC, Pogatzki-Zahn EM. Chronic post-surgical pain – update on incidence, risk factors and preventive treatment options. BJA Education 2022 Feb 24;22(5):190–6.
2. Doleman B, Mathiesen O, Sutton AJ, Cooper NJ, Lund JN, Williams JP. Non-opioid analgesics for the prevention of chronic postsurgical pain: a systematic review and network meta-analysis. British Journal of Anaesthesia 2023 Apr 12;130(6):719–28.
3. Schug SA, Manopas A. Update on the role of non-opioids for postoperative pain treatment. Best Practice & Research Clinical Anaesthesiology 2007 Mar 1;21(1):15–30.
4. Watson JA, Holmes CC. Machine learning analysis plans for randomised controlled trials: detecting treatment effect heterogeneity with strict control of type I error. Trials 2020 Feb 10;21(1).

Non-opioid analgesics for reducing postoperative pain, opioid consumption and adverse events – respiratory depression (ongoing)

B. Doleman, P. Douzenis

Background

Postoperative pain negatively affects quality of life and functional recovery and is considered a risk factor for persistent pain. Postoperative pain is often managed with opioid medications. Opioids have significant side effects that limit their use including respiratory depression. Postoperative opioid induced respiratory depression is a significant cause of death and brain damage in the perioperative period. Gabapentinoids have been associated with respiratory depression although reductions in opioid consumption may reduce respiratory depression. We therefore conducted a meta-analysis to determine whether gabapentinoids influence postoperative respiratory depression.

Methods

The studies included were randomised controlled trials in adult patients (18 years and older) undergoing a surgical procedure under general or regional anaesthesia. Studies were excluded for other procedures such as dental surgery and ophthalmic procedures. Studies were excluded if they did not report clinical outcomes, pharmacokinetic studies, cluster randomised trails, quasi-randomised trials and cohort studies. Bias assessment of all studies was performed following data extraction using the revised Cochrane risk-of-bias tool for randomised trials (RoB2). Results were synthesised using a random effects model. Statistical heterogeneity was assessed using I2 statistic. Odds ratios (OR) and 95% confidence intervals (CIs) were used for estimates. Publication bias was assessed using inverse sample size on the Y axis. All analyses were conducted in R statistical software.

Results

15 studies were analysed. There was no evidence of statistical heterogeneity (I2=0%). There was no difference in respiratory depression with gabapentinoids (OR 0.80; 95% CI 0.43 to 1.50). There was no evidence of publication bias (P = 0.29).

Conclusions

Gabapentinoids were not associated with reduced respiratory depression.

References

Lee, L.A. et al. (2015) 'Postoperative opioid-induced respiratory depression', Survey of Anesthesiology, 59(5), p. 250. doi:10.1097/sa.0000000000000172.

Nir, R. -R. et al. (2016) 'Preoperative Preemptive Drug Administration for acute postoperative pain: A systematic review and meta-analysis', European Journal of Pain, 20(7), pp. 1025–1043. doi:10.1002/ejp.842.

Pirie, K. et al. (2022) 'Current approaches to acute postoperative pain management after major abdominal surgery: A narrative review and Future Directions', British Journal of Anaesthesia, 129(3), pp. 378–393. doi:10.1016/j.bja.2022.05.029.

Shrestha, S. and Palaian, S. (2021) 'Respiratory concerns of gabapentin and pregabalin: What does it mean to the pharmacovigilance systems in developing countries?', F1000Research, 9, p. 32. doi:10.12688/f1000research.21962.2.

Srivastava, D. et al. (2021) 'Surgery and opioids: Evidence-based expert consensus guidelines on the perioperative use of opioids in the United Kingdom', British Journal of Anaesthesia, 126(6), pp. 1208–1216. doi:10.1016/j.bja.2021.02.030.
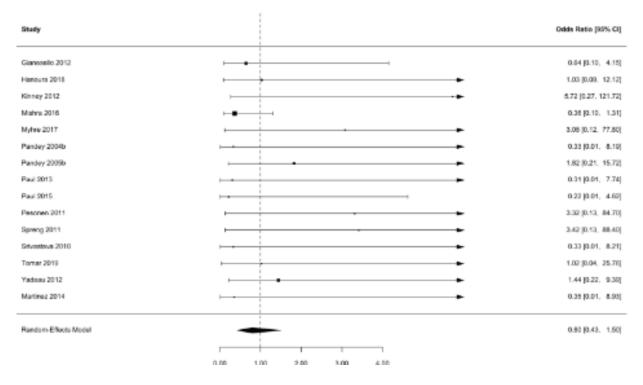
Figure 1: Forest Plot showing the included studies and the odds ratio and confidence interval as well as the random effects model.

The critical role of advanced neurophysiological techniques in the surgical management and post-operative prognostication of a patient with hemifacial spasm (HFS)

Aaida Eghbal[1], Alba Diaz Baamonde[2], Sinan Barazi[2], Ana Mirallave[2], Jose David Siado[2]

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Background

Hemifacial spasm (HFS) is a peripheral movement disorder characterised by involuntary facial muscle contractions, typically caused by compression of the facial nerve (CNVII) by aberrant branches of the anterior or posterior inferior cerebellar artery (Chaudhry et al., 2015). Microvascular decompression (MVD) is a surgical approach used to treat HFS. Continuous intraoperative neurophysiological monitoring (IONM) ensures effective decompression of the offending vessel from CNVII, whilst minimising the risk of neurological injury. Key parameters include lateral spread response (LSR) and blink reflex (BR) synkinesis, which are expected to disappear or reduce significantly upon successful decompression (Bollu., 2024).

LSR is proposed to result from peripheral hyperexcitability (Hsu et al., 2019). Conversely, BR synkinesis may reflect the extension of this excitability, with central changes to the facial motor nucleus (Møller, 1991). This case report evaluates the differential behaviours of LSR and BR synkinesis during MVD, and their prognostic implications.

Methods

A 46-year-old female with chronic, medically-refractory, right-sided HFS underwent MVD. Baseline IONM recordings were measured, and thresholds for eliciting BR synkinesis and LSRs were defined. The Teflon sponge was placed between the offending vessel and CNVII, and post-decompression thresholds were subsequently determined following separation.

Results

Baseline monitoring revealed significant hyperexcitability of the right facial nerve, with pathological responses reflecting both peripheral and central underlying mechanisms (Figure 1). Following decompression, LSRs disappeared, and BR thresholds increased, suggesting successful nerve release. However, intermittent BR synkinesis persisted, implying residual central hyperexcitability. Despite some initial post-operative facial twitching, the patient has since experienced substantial improvement in symptoms.

Conclusions

As demonstrated in our case, MVD of the facial nerve appears to have a more prominent effect on the peripheral component of this hyperexcitable state. The disappearance of LSRs indicates effective decompression, while BR synkinesis provides additional insights into central mechanisms. Utilising LSR and BR synkinesis concurrently enhances surgical precision and aids in predicting long-term outcomes, emphasising the prognostic value of BR synkinesis in managing chronic HFS cases.

References

OLLU., T. R. C. F. L. P. C. 2024. Hemifacial Spasm [Online]. Treasure Island (FL): StatPearls Publishing StatPearls [Internet]. Available: https://www.ncbi.nlm.nih.gov/books/NBK526108/ [Accessed 14/05/2024].

CHAUDHRY, N., SRIVASTAVA, A. & JOSHI, L. 2015. Hemifacial spasm: The past, present and future. Journal of the Neurological Sciences, 356, 27-31.

HSU, P.-C., YANG, T.-F., HSU, S. P. C., YEN, Y.-S., LIN, C.-F., TSAI, Y.-Y., CHOU, C.-L. & WU, H.-L. 2019. Blink synkinesis monitoring during microvascular decompression for hemifacial spasm. Journal of the Chinese Medical Association, 82, 519-523.

MØLLER, A. R. 1991. Interaction between the blink reflex and the abnormal muscle response in patients with hemifacial spasm: Results of intraoperative recordings. Journal of the Neurological Sciences, 101, 114-123.

Figure 1: Baseline intra-operative neuromonitoring (IONM), demonstrating pathological lateral spread responses (LSR) (green box) and pathological blink reflex (BR) synkinetic responses (red box) on the affected right side. These findings collectively support a hyperexcitable right facial nerve.

Investigating the structure-function relationship of the healthy human brain using high-resolution connectomes

Reece W Hill, Marcus Kaiser

Background

The connectome maps brain connectivity. As two brain areas co-activate only if directly or indirectly connected, a prevailing theory suggests brain activity may be inferred from it. Prior research shows that coarse intra-areal connectomes correlate moderately with functional networks (Pearson's r = 0.416, p < 0.0001) [1]. Yet, machine-learning methods predict brain activity from structural connectomes with extraordinary accuracy (cohort-averaged: r = 0.9 ± 0.1) [2], suggesting an inextricable link between structure and function.

This study extends the work of Taylor et al. [3], employing diffusion- and T1- weighted magnetic resonance images (MRI) to approximate human structural connectomes and compare them to task-based functional MRI (fMRI). We assess whether motor homunculus areas emerge from sub-portions of the connectome.

Methods (see image on next page)

MRIs of healthy adults (n=150) were sourced from an open dataset. Cortical surfaces were downsampled to high-resolution triangular meshes (64,000 points per hemisphere). A deterministic fibre-tracking algorithm followed neurone paths within precentral gyri. Using this intra-region connectivity, each gyrus was divided into "structural modules".

fMRIs from five motor tasks (tongue and bilateral hand and foot movements) were projected onto the mesh and treated as spatially discrete "functional modules".

Akin to genomics, the modalities' modules were treated as categorical sequences (indexed by mesh position) for quantitative analysis: do structural modules constrain function?

Results

High structure-to-function completeness scores (mean=0.71; SD=±0.0941) indicated substantial structural prediction of functional activations. Function-to-structure completeness was lower (mean=0.30; SD=±0.1116), suggesting some functional modules cross structural module boundaries.

Mutual information (MI) scores further indicated strong structure-function concordance (mean=0.76; SD=±0.2804). Paired t-tests comparing real versus permuted connectomes showed significant differences (t=155.12; p < 0.0001; Cohen's d ≈ 2.39).
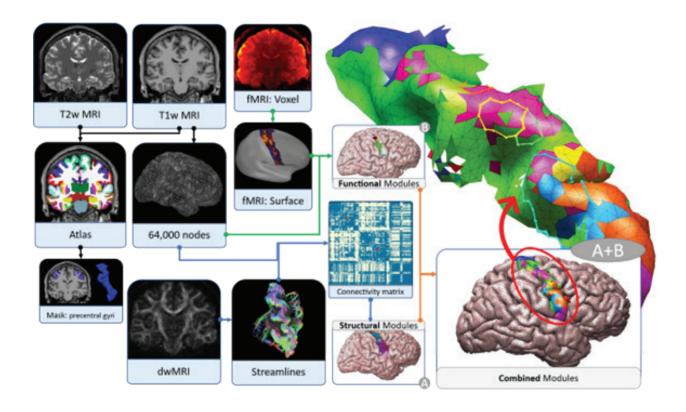
Conclusion

The connectome constrains functional activity, though function remains partially flexible. Future work will address structure-function outliers, consider spatial alignment metrics, and explore whether structure-function deviations correlate with changes in dexterity, endurance, or strength.

References

[1] Gu, Z. et al. (2021) 'Heritability and interindividual variability of regional structure-function coupling', Nature Communications, 12(1). doi:10.1038/s41467-021-25184-4.

[2] Sarwar, T. et al. (2021) 'Structure-function coupling in the human connectome: A machine learning approach', NeuroImage, 226, p. 117609. doi:10.1016/j.neuroimage.2020.117609.

[3] Taylor, P.N., Wang, Y. and Kaiser, M. (2017) 'Within Brain Area Tractography suggests local modularity using high resolution connectomics', Scientific Reports, 7(1). doi:10.1038/srep39859.

T2w MRI

T1w MRI

fMRI: Voxel

Atlas

64,000 nodes

fMRI: Surface

Mask: precentral gyri

dwMRI

Streamlines

Connectivity matrix

Functional Modules

Structural Modules

Combined Modules

A+B

A Systematic Review to Assess the Effectiveness of Testing Uptake Interventions of Hepatitis B amongst Prison Population

Saumiya Kesavan, Jo Leonardi-Bee, and Joanne R Morling

Background

Hepatitis B (HBV) is a blood borne virus that can cause chronic liver disease. The World Health Organisation (WHO) estimates that 254 million people are living with chronic hepatitis in 2022, with a rise in 1.2 million cases per year (1). There is a higher prevalence of blood borne viruses amongst the prison population. To this date, there has not been a published systematic review that assesses the effectiveness of interventions to promote testing uptake of hepatitis B amongst the prison population.

Methods

Databses searched: OVID MEDLINE, OVID EMBASE, CENTRAL, and CINAHL. The inclusion criteria for the papers: prison population, attended prison after 1st of January 2000, and must be an intervention study of quantitative study design including randomised control trial, non-randomised intervention studies, or controlled interrupted time series. Economic studies will also be included. After title, abstract and full-text screening, the included articles will undergo data extraction. The relevant Joanne Briggs Institute (JBI) critical appraisal tool will be used to appraise the quality of the study. Synthesis of the data will be done as a narrative synthesis where it will be adherent to the Synthesis Without meta-analysis (SWiM) guideline. Sub-group analysis will be performed to ascertain if this impacts outcome e.g. low vs. high-income countries, the category of prisons, and the specific study design. If sufficient similarities exist within the included studies, a random effect meta- analysis will be conducted to quantify the pooled effectiveness of the intervention. Heterogeneity will be quantified using I2.

Methods (continued)

Heterogeneity will be explored using subgroup analysis based on the category of prison and the geographical location of the study (HIC vs LMICs). Additionally, sensitivity analysis will be conducted where studies will be excluded where the criterion for allocation concealment or having similarity in characteristics between the treatment groups is not met.

Results and Conclusion

TBC

References

1. Hepatitis B [Internet]. [cited 2025 Feb 28]. Available from: https://www.who.int/news-room/fact-sheets/detail/hepatitis-b

To determine the factors predicting post-operative motor recovery in patients with footdrop secondary to lumbar degenerative disease and to propose a critical time frame for operative management

Abbas Khizar Khoja; Asfand Baig Mirza; Vishvan Naidu; Suleyman Ullah; Priyanka S. Iyer; Jack Plume; Arsalan Baig; Chaitanya Sharma; Ahmed Ramadan Sadek

Background

Footdrop is defined as partial or complete failure of ankle dorsiflexion. Left untreated it has potential for lifelong disability. Amenable to neurosurgical management, degeneration at spinal nerve roots—lumbar degenerative disease (LDD)—is a recognised cause of footdrop. LDD warrants thorough investigation given the absence of standardised management protocols.

Methods

The systematic review and meta-analysis were carried out in accordance with the PRISMA statement and with pre-defined eligibility criteria. The validated MRC muscle power scale for ankle dorsiflexion was used uniformly throughout the review (table 1). The primary outcome was the degree of motor function recovery at final follow-up. An improvement to >3/5 was used as the definition of recovery from footdrop. Predictors of recovery (patient age, gender, pre-operative severity, symptom duration, and spinal level of pathology) were tested for statistical significance at alpha level 0.05 using a multi-variate cumulative odds statistical model.

Results

The search returned 1037 studies of which 66 extractable individual patient cases were eligible for inclusion. Statistical analysis demonstrated that patients aged ≤ 47 [P=0.045] and symptom duration ≤6 weeks [P=0.01] had favourable outcomes. When comparing pre-operative severity, patients with the highest severity of footdrop (MRC=0/5) were upto 23 times more likely to have poorer post-operative motor function when compared to patients with lower severity clinical foot drop (MRC >/=2/5) [P=0.001]. Gender and level of pathology were not statistically significant factors. A time frame of </=6 weeks from onset was isolated as critical for surgical decompression after which outcomes started to dramatically shift towards poorer motor recover.

Conclusions

We isolated three factors significantly prognosticating motor recovery: (1) ≤47 years age, (2) symptom duration ≤6 weeks, and (3) Lower pre-operative severity. We recommend a critical time-frame of under 6 weeks for surgical intervention from onset for this population. Further prospective, multi-centred research is required to explore these factors further.

References

1. Liu K, Zhu W, Shi J, et al. Foot Drop Caused by Lumbar Degenerative Disease: Clinical Features, Prognostic Factors of Surgical Outcome and Clinical Stage. PLoS One. 2013;8(11):null. doi:10.1371/journal.pone.0080375
2. Brockett CL, Chapman GJ. Biomechanics of the ankle. Orthop Trauma. 2016;30(3):232-238. doi:10.1016/j.mporth.2016.04.015
3. Nath RK, Somasundaram C. Incidence, Etiology, and Risk Factors Associated with Foot Drop. Eplasty. 2023;23:e16.
4. Macki M, Lim S, Elmenini J, Fakih M, Chang V. Clinching the cause: A review of foot drop secondary to lumbar degenerative diseases. J Neurol Sci. 2018;395:126-130. doi:10.1016/j.jns.2018.09.036
5. Adibatti M, V S. Study on variant anatomy of sciatic nerve. J Clin Diagn Res. 2014;8(8):AC07-9. doi:10.7860/JCDR/2014/9116.4725

SCORE	DESCRIPTION
0	No contraction
1	Flicker or trace of contraction
2	Active ankle dorsiflexion with gravity eliminated
3	Active ankle dorsiflexion against gravity
4	Active ankle dorsiflexion against gravity and resistance
5	Normal ankle dorsiflexion

Table 1: MRC Power Scale for Ankle Dorsiflexion. </=3 defines presence of footdrop.

Determining Models Of Education Delivery In Clinical Placements For High-Volume And High-Quality Clinical Placements In Primary Care

Dr Amirah Latief, Professor Jaspal Taggar, Dr Kate Hodson

Background

General practice is a vital setting for undergraduate clinical education. However, student experiences vary, especially in high-volume placements. Delivery of effective medical education in primary care depends on various aspects including supervision, structured induction, clinic structure, and engagement opportunities (1,2). High satisfaction is linked to meaningful participation and support (3), while poorly structured placements often yield negative outcomes (4). Although primary care is generally viewed favourably, relatively few students select it as a first-choice career, with educational quality representing a key determining factor (5). Understanding characteristics of high-performing, high-volume teaching practices is hereby essential to improve clinical education and promote careers in general practice.

Methods

This mixed-methods study will analyse feedback from 4th and 5th-year medical students across 80 general practices in Nottinghamshire. Practices with response rates of ≥ 50% will be included. High-volume practices (≥10 students) will be stratified into those with high and lower satisfaction scores. A structured survey will be developed and distributed, featuring Likert-scale and open-ended questions on key aspects of primary care education, including supervision, induction, clinic exposure, home visits, and MDT involvement. Quantitative and thematic analyses will compare practices with higher and lower satisfaction scores to identify key differences and inform models for effective clinical education in high-volume settings.

Results

Survey design and piloting will occur in April and May. Data collection is planned for June. Comparative analysis will identify key factors influencing the quality of medical education in high-volume practices. Ethical approval will be obtained before publication.

Conclusion

Findings will inform strategies for delivering effective, scalable undergraduate teaching in general practice. Insights may help to improve student experiences and encourage future careers in primary care.

References

1. Mokhtari Nouri J, et al. Identification of the factors that affect clinical education: A qualitative study. Med J Islam Repub Iran. 2023;37(10):612–619.
2. Taghizadeh Z, et al. Clinical education barriers from the perspective of nursing and midwifery students: A qualitative study. J Educ Health Promot. 2023;12:29.
3. Fessehaye A, et al. Undergraduate students' satisfaction with clinical learning environment in a resource-limited setting: A cross-sectional study. BMC Med Educ. 2024;24(1):120.
4. Arkan B, Ordin Y, Yılmaz D. Undergraduate nursing students' experience related to their clinical learning environment and factors affecting their clinical learning process. Nurse Educ Pract. 2018;29:127–132.
5. Alshahrani M, et al. Medical students' attitudes towards family medicine in Saudi Arabia. J Fam Med Prim Care. 2014;3(2):123–127.

Clinical Outcomes of Adjuvant Antibiotic-Loaded Stimulan Beads in Periprosthetic Joint Infection Management: A Retrospective Service Evaluation at a Tertiary Centre

Dr A. Nadella, Prof. A. Pillai

Background

Periprosthetic joint infections (PJIs) are devastating complications of total joint arthroplasty, contributing to increased morbidity, mortality, and healthcare costs (1). Stimulan, a bioabsorbable calcium sulphate antibiotic carrier, has been utilised as an adjuvant therapy for PJI treatment. This service evaluation aimed to assess the clinical outcomes of adjuvant Stimulan use in PJI patients at a tertiary centre, Wythenshawe Hospital.

Methods

A retrospective analysis was conducted on 20 PJI cases treated with Stimulan between October 2021 and February 2024 at Wythenshawe Hospital. The inclusion criterion was PJI diagnosis according to the Musculoskeletal Infection Society 2018 criteria. Microbiology data, infection outcomes, implant removal, mobility, and complications were collected. Cases were stratified into infection control (Group A) and implant removal due to infection persistence/ recurrence (Group B) groups for analysis. Infection control was defined as resolution of infection and maintenance of this according to C-reactive protein (CRP) values, clinic notes and imaging.

Results

Infection control was achieved in 77.77% (n=14/18) of the cases, whereas implant removal due to infection persistence/recurrence occurred in 22.22% (n=4/18) of cases.

Results (continued)

Subgroup analysis revealed a correlation between implant removal and debridement, antibiotics, and implant retention (DAIR) procedures. The wound drainage complication rate was 50%, which was higher than those reported in past studies. Mobility improved or remained stable in 86.67% (n=13/15) of the cases evaluated.

Conclusion

This service evaluation demonstrated promising infection control with adjuvant Stimulan in PJI management at Wythenshawe Hospital. However, implant removal was more common with DAIR operations, suggesting that single/ two-stage revisions with Stimulan may yield better outcomes. The high wound drainage rate warrants further investigation. Future research is required to evaluate factors contributing to treatment failure. This study provides the foundation for future research into whether Stimulan beads, rather than systemic antibiotics, should be used as the primary adjunct in PJI surgical management.

References

1. Atkin B, Dupley L, Chakravorty P, Zafar K, Boden R. Approach to patients with a potential prosthetic joint infection. BMJ. 2022 Mar 21;376:e069502.

The role of Artificial Intelligence in the Detection of Rotator Cuff Tears: A systematic review and meta-analysis

Nidhruv Ravikumar, Thomas Kurien, Jason Ong

Conclusion

The overall data suggests that AI has a high accuracy rate in the identification of RCTs. It improves clinician efficiency by accelerating the speed to diagnosis and can improve healthcare costs. It is a suitable to adjunct for the diagnosis of RCTs. However further research is warranted to optimise AI models to accurately diagnose multiple different pathologies prior to uptake within clinical settings.

Background

Within the last decade, Artificial Intelligence (AI), has been a widely researched subject in the field of healthcare. One of the most common areas of interest is in diagnostic imaging. Rotator cuff tears (RCT) are one of the most common causes of shoulder disability. The diagnosis of RCTs can often be a time-consuming process with a great inter-reader variability. Hence, there are various AI software that have been created to aid in the detection of RCTs. This study aims to review the literature and assess the diagnostic performance of AI in the detection of RCTs.

Methods

A systematic literature search was performed in accordance with the PRISMA guidelines. Studies that analysed the use of AI using Convolutional Neural Networks in the detection of RCTs were included within the study.

Results

12 studies, including 17 different CNN software were included in the study. The pooled sensitivity was 0.92 (95% CI [0.90 - 0.95]) and pooled specificity for the AI for models was 0.83 (95% CI [0.79 - 0.87]). It was noted that highest sensitivities and specificities were noted with Ultrasound images.

Performance of Faecal Immunochemical Texting in Symptomatic Patients Under 50 Attending Primary Care: A Systematic Review

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Background

Although traditionally associated with older adults the incidence of colorectal cancer (CRC) has risen rapidly in younger patients over the last few decades. Despite this the absolute prevalence of CRC in patients under 50 remains low with high relative frequency of other bowel pathologies. With recent national guidelines advocating for faecal immunochemical testing (FIT) as a diagnostic triage tool for symptomatic patients in primary care it is crucial to ascertain its diagnostic performance in the younger age group.

Methods

This Systematic review was performed as per the PRISMA statement and prospectively registered on PROSPERO (CRD42025638390). The search strategy was formulated in MEDLINE and EMBASE. The primary outcome was to assess the diagnostic performance of FIT in detecting colorectal cancer, advanced adenoma and high risk polyps in symptomatic patients under 50 years at the NICE-recommended FIT positivity threshold of 10 µg Hb/g.

Results

Altogether 3308 records were screened. Twenty studies were deemed eligible. Authors have been contacted to seek data to perform a quantitative and/or qualitative analysis. We await their responses in order to complete the review.

Conclusion

Synthesised evidence from this review will enable assessment of the clinical utility of FIT in younger symptomatic patients, providing guidance for clinical decision making in primary care and the optimisation of local referral pathways.

A retrospective cohort study evaluating the use of zonal and non-zonal models in penetrating neck injuries

Remarez Sheehan, Lauren Blackburn, David Hewson, Rory O' Connor

Background

Historically, treatment of penetrating neck injuries (PNIs) was determined by external wound position according to a 3-zone horizontal model by Monson et al[1]. Recently, evidence has questioned the use of this zonal approach, and modern algorithms focus on clinical signs and imaging.

Methods

To assess the use of zonal models we are doing a retrospective cohort study on all adult trauma-called patients presenting with PNIs to QMC Major Trauma Centre over the last 5 years. We will determine external wound injury zones using clinical images and correlate them with intraoperative findings to determine their predictive value. We will use this approach to evaluate Monson's model and our own novel 2-tier vertical zoning model, both of which will be compared against a non-zonal approach outlined by RCS England[2]. Binary logistic regression will be used to identify if our model can predict the need for airway or vascular interventions.

Results

Our pilot data for the last year has identified 25 eligible patients, 3 female, with a median age of 36. Stabbing was the most common mechanism (92%), either by self (56%) or assault (36%). 13 (52%) patients required blood and 2 patients (8%) required intubation prehospitally or in ED. There were 6 hard signs associated with 5 different injuries; 3 expanding haematomas, 1 pulsatile bleed, 2 wounds with bubbling and 1 with extensive subcutaneous emphysema. 6 patients had haemodynamic instability, although only 1 patient went straight to theatre without CT.
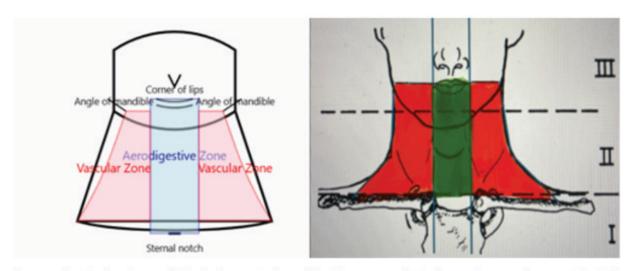
Results (continued)

86% of patients went to theatre for surgical exploration; 32% of which were negative for any vascular or soft tissue injury. Of the injuries found; IJV (20%), ECA (16%) and the pharynx (12%) were most prevalent. 2 patients developed unilateral vocal cord palsy and 2 had aspiration pneumonias complicating their recovery. 1 patient died in theatre secondary to haemorrhagic shock.

Conclusion

Pending clinical image analysis by our senior author.

References

1. Monson, D. O., Saletta, J. D. & Freeark, R. J. Carotid vertebral trauma. J Trauma 9, 987–999 (1969).
2. Nowicki, J., Stew, B. & Ooi, E. Penetrating neck injuries: a guide to evaluation and management. Ann R Coll Surg Engl 100, 6–11 (2018).

Proposed vertical zoning model including central aerodigestive zone and lateral vascular zone. Image on the right shows vertical zoning model super-imposed on Monson et al's historical horizontal zoning model.

Improving precision of malignancy prediction in pulmonary nodules

Manasi Shirke

Background

Incidental and indeterminate pulmonary nodules are becoming increasingly common in individuals undergoing CT scanning. Some nodules can be an early sign of cancer. British Thoracic Society guidelines recommend the use of mathematical models to predict the risk of malignancy of a nodule, such as the Herder model. The model assesses the risk of malignancy in nodules following PET scanning and largely relies on subjective visual classification of the intensity of the FDG uptake on PET, which is dependent on the radiologist. The aim of this study is to create a mathematically robust model for predicting malignancy of pulmonary nodules.

Methods

2261 PET scan reports were analysed from years 2017-2022 to look for single and double pulmonary nodules. This is a descriptive analysis of over 1000 nodules in the Nottinghamshire area.

Results

We included 765 patients with SPNs and 275 patients with two pulmonary nodules. Of the 765 with SPNs, 630 patients had nodules of less than 20mm in size. The average age of these patients at the time of scans was 70. There were more females compared to males (337,293 respectively). Most patients had nodules between 10mm-20mm in size (435). 195 patients had nodules less than 10mm, 135 patients had nodules between 20mm and 30mm in size. The scans were further analysed and measurements of the Standardised Uptake Value of the nodules were obtained. Mediastinal blood pool values were also measured as a comparator. Most SUVmax measurements were between 1 and 3 (255), followed by 94 between 3 and 5.

Conclusion

Currently, baseline characteristics are being analysed. Additional radiological data has been collected from the scans, such as the SUV measurements and size of the nodule. Using the patient factors in addition to the radiological and nodule factors, we aim to develop a new mathematical model for predicting malignancy of pulmonary nodules.

References

1. Callister ME, Baldwin DR, Akram AR, Barnard S, Cane P, Draffan J, et al. British Thoracic Society guidelines for the investigation and management of pulmonary nodules. Thorax. 2015;70 Suppl 2:ii1-ii54.
2. Herder GJ, van Tinteren H, Golding RP, Kostense PJ, Comans EF, Smit EF, et al. Clinical prediction model to characterize pulmonary nodules: validation and added value of 18F-fluorodeoxyglucose positron emission tomography. Chest. 2005;128(4):2490-6.
3. Perandini S, Soardi GA, Larici AR, Del Ciello A, Rizzardi G, Solazzo A, et al. Multicenter external validation of two malignancy risk prediction models in patients undergoing 18F-FDG-PET for solitary pulmonary nodule evaluation. Eur Radiol. 2017;27(5):2042-6.
4. Al-Ameri A, Malhotra P, Thygesen H, Plant PK, Vaidyanathan S, Karthik S, et al. Risk of malignancy in pulmonary nodules: A validation study of four prediction models. Lung Cancer. 2015;89(1):27-30.
5. Yang B, Jhun BW, Shin SH, Jeong BH, Um SW, Zo JI, et al. Comparison of four models predicting the malignancy of pulmonary nodules: A single-center study of Korean adults. PLoS One. 2018;13(7):e0201242.

Adverse Events Associated with Psilocybin Use in Chronic Pain Management: A Systematic Review and Preliminary Descriptive Analysis

Shahida Wahid, Mamon Nofal, Neil Nixon, Naomi Thorpe, Dave Ashbey

Background

Chronic pain is a widespread condition with significant personal and societal impacts. Amid the ongoing opioid crisis, there is an urgent need for alternative treatment options. Psilocybin, the active compound in "magic mushrooms", is a serotonergic psychedelic that primarily targets 5-HT2A receptors and has re-emerged in clinical research due to promising therapeutic effects. However, safety data regarding its use in chronic pain remains limited. This systematic review aims to evaluate the adverse events (AEs) associated with psilocybin use in chronic pain, offering insights into its safety, tolerability, and reporting practices in clinical trials.

Methods

A systematic search of MEDLINE, Embase, Cochrane CENTRAL, ClinicalTrials.gov, and Scopus was conducted on November 12, 2024, without date restrictions. Eligible studies included clinical trials involving adults with non-cancer chronic pain, receiving any form or dose of psilocybin or psilocin, compared with placebo, no treatment, or standard care. The review followed PRISMA guidelines. Two independent, blinded reviewers screened records using Rayyan and extracted data into Excel spreadsheets.

Results

After removing duplicates, 679 records were screened, and seven trials met the inclusion criteria. One eligible trial is yet to publish data; researchers were contacted to obtain this data for a full quantitative analysis. A descriptive analysis of the six trials with available AE data (n = 53) was conducted. No serious AEs were reported. The most common mild and transient AEs included nausea, headache, anxiety, and fatigue. AEs were recorded on the experimental day and most provided data for the following 24 hours, however no studies reported AEs beyond this acute period.

Conclusion

Psilocybin appears to have a favorable short-term safety profile in chronic pain populations. While findings are preliminary and limited by small sample sizes, they highlight the need for further research and for longer-term reporting of adverse events. Pending additional data, future meta-analysis may offer deeper safety insights.

Highlights of last year's meeting

The 2024 Annual Showcase was a resounding success, where we brought together researchers of all career stages to celebrate and share the achievements of CATP's members. The event featured 23 poster presentations from SFPs, ACFs and CLs and 9 oral presentations from ACFs and CLs. The presentations spanned a diverse range of research from basic science to clinical applied healthcare research, showcasing the breadth and depth of research undertaken by CATP's members.

More than 70 participants contributed to dynamic discussions, insightful feedback, and valuable networking opportunities. The keynote address by Professor Alan Montgomery, Director of Nottingham Clinical Trials Unit, inspired attendees to consider clinical trials in their future academic careers and highlighted the impact these have on developing the health of UK and global populations.

The showcase also fostered new collaborations and networking. Participant surveys reflected overwhelming satisfaction, with 51% rating the event as "extremely useful" and 43% as "somewhat useful". A particular highlight for many attendees was the focus groups, where we shared specific advice and insight on career development for each stage of the clinical academic career. Participants fed back that the "advice given was excellent" and "it was valuable to be able to talk through the next steps".

Last year's winners

Our expert panel of senior academics judged the presentations. The winners were:

- CL oral presentation – **Paul Briley** for "Boosting non-invasive brain stimulation therapy for major depressive disorder"

- CL poster presentation – **Brett Doleman** for "Non-opioid analgesics for acute pain and opioid adverse events after surgery: a Bayesian network meta-analysis"

- ACF oral presentation – **Daniele Scotto** for "Characterisation of myeloid-derived suppressor cells as a therapeutic target in glioblastoma (GBM)"

- ACF poster presentation – **Gavin Fong** (pictured below left) for "Reporting of concomitant and rescue topical therapies in Eczema randomized controlled trials evaluating a systemic treatment: a scoping review"

- SFP poster presentation – jointly **Faheem Bhatti** for "Diffusion weighted image parameters for the characterisation of untreated gliomas: a systematic review of cohort composition and techniques" and **Yousif Aldabbagh** for "Signs & Symptoms Predictive of CSF Shunt Dysfunction in Children & Young People Presenting to ED"

Thank you to Professor Helen Budge

We would like to extend our deepest gratitude to Professor Helen Budge, who in 2024 stepped down as Director of CATP after an extraordinary 18 years of dedicated leadership and unwavering commitment.

Your vision, passion, and tireless efforts have not only shaped the direction of the programme but have also profoundly impacted the careers and lives of countless individuals. During your tenure, a remarkable 162 clinical academics have passed through the programme, receiving support and guidance as they embarked on clinical academic careers.

Under your guidance, the programme has flourished, evolving into a beacon of excellence and innovation. More importantly, your mentorship and support have empowered many to grow, achieve, and surpass their own expectations. Your legacy of nurturing talent and fostering a collaborative spirit will continue to inspire us all.

As you step down, please know that your contributions have left an indelible mark, and your influence will be felt for many years to come. Thank you for your remarkable service, your leadership, and above all, your dedication to people.

We wish you all the best in your next chapter.

Meet the team

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