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Clinical Academic Training Programme Showcase 2024

Welcome

To all, a very warm welcome to the 2024 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
Deputy Director of Clinical Academic Training Programme

Professor Shalini Ojha
Deputy Director of Clinical Academic Training Programme

Professor Helen Budge
Director of Clinical Academic Training Programme


Clinical Lecturers' Oral Presentations
Conclusion
Fire action

The acceptability and effectiveness of standardised diagnostic assessment approaches in children and young people's mental health services: An updated systematic review

Dr Salah Basheer, Dr Sue Fen Tan, Prof Kapil Sayal, Dr Ranjitha David, Dr Pallab Majumder

Background

The complex nature of children and young people's (CYP) mental health difficulties and subjectivity among child and adolescent mental health services (CAMHS) clinicians' pose diagnostic barriers (Frith, 2017; O'Connor et al., 2020). Standardised diagnostic assessments (SDA) guide evidence-based practice and improve diagnosis but they have not been consistently used in the CAMHS setting for various reasons (Reeves et al., 2016). Since the CAMHS landscape is changing with increasing waiting times and referral rejections, we aim to review the current acceptability and clinical utility of SDAs in CAMHS.

Methods

Literature search for peer-reviewed articles published from Jan 2013 to Aug 2023 was performed on PubMed, ASSIA, Cochrane Library, DARE, Embase, International Bibliography of Social Sciences, MEDLINE and PsycINFO. The review was registered (PROSPERO: CRD42024494051). Screening of titles and abstracts, followed by full articles, were independently performed by two authors. The quality appraisal of the reviewed articles will also be done using standardised checklist.

Results

We identified ten studies that evaluated the use of SDA in clinical practice (see Figure 1). Development and Wellbeing Assessment (DAWBA) was found to improve accuracy of referral decisions and improve identifying mental health disorders in clinics. Mini-International Neuropsychiatric Interview for Children and Adolescents was also shown to improve diagnosis compared to regular clinical assessment. Kiddie Schedule for Affective Disorders and Schizophrenia- Present Lifetime improved the detection of anxiety disorder despite symptom being absent in the referral information. While clinicians expressed predominantly positive sentiments regarding its psychometric properties, their views on its utility and feasibility in routine clinical assessment were less favourable.

Conclusion

Though the use of SDA has been shown to be effective in improving clinical diagnosis and referral decision making, there continues to be concerns around the utility and feasibility among clinicians. Further research around cost-effectiveness and patient acceptability with respect to use of SDA are needed.

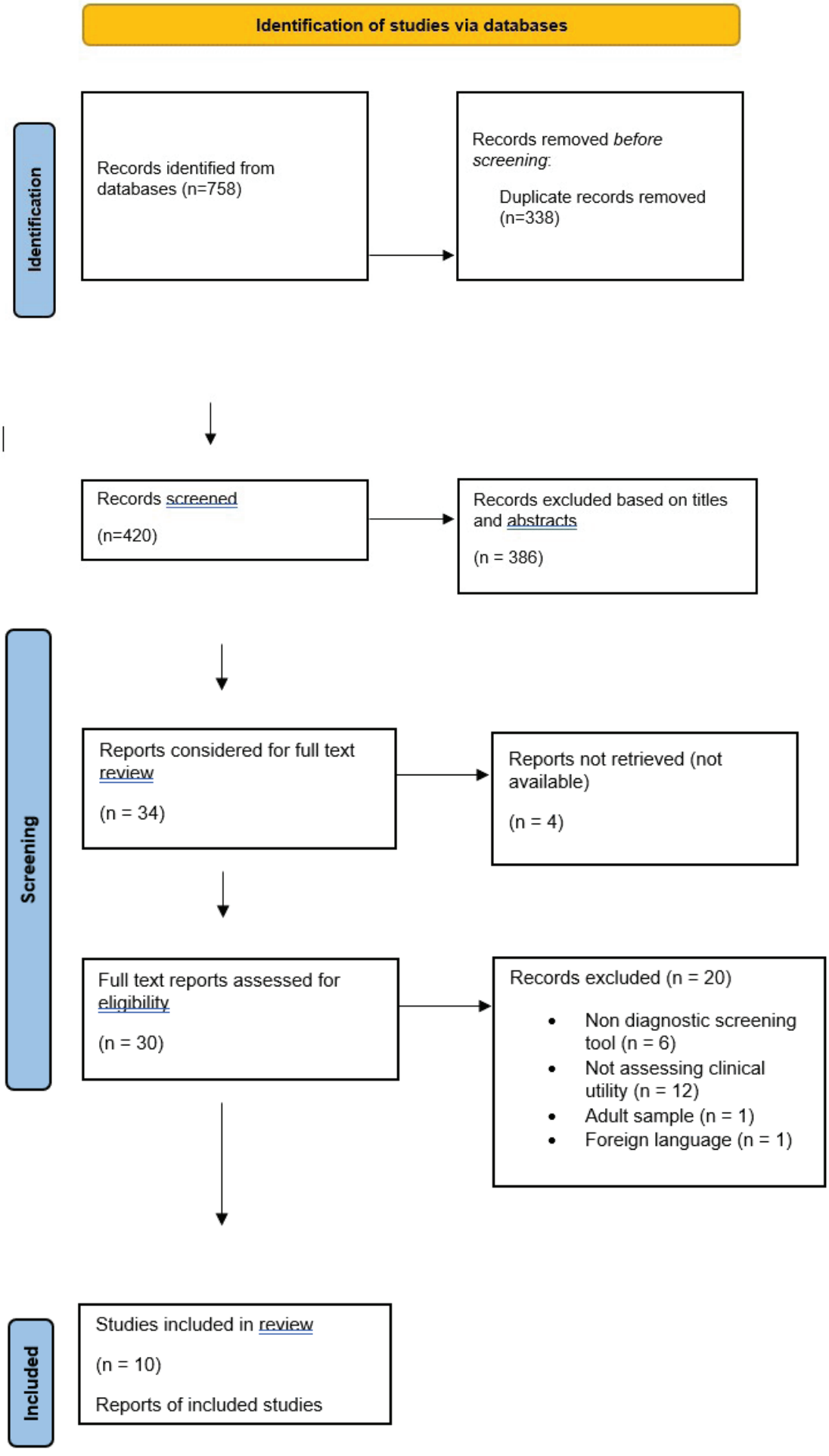
References

O'Connor, C., Downs, J., Shetty, H., & McNicholas, F. (2020). Diagnostic trajectories in child and adolescent mental health services: Exploring the prevalence and patterns of diagnostic adjustments in an electronic mental health case register. European Child & Adolescent Psychiatry, 29(8), 1111–1123. https://doi.org/10.1007/s00787-019-01428-z

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

Reeves, K., Charter, E., & Ford, T. (2016). Measurement Issues: Is standardised diagnostic assessment feasible as an adjunct to clinical practice? A systematic review. Child and Adolescent Mental Health, 21(1), 51–63. https://doi.org/10.1111/camh.12089

Figure 1: The study screening process and selection of papers



Boosting non-invasive brain stimulation therapy for major depressive disorder

Paul M Briley, Clinical Assistant Professor in General Adult Psychiatry
Clement Boutry, Lucy Webster, Domenica Veniero, Catherine Harvey-Seutcheu, JeYoung Jung, Peter F Liddle, Richard Morriss.

Background

Transcranial magnetic stimulation (TMS) delivers precisely timed magnetic pulses over the scalp to non-invasively stimulate specific brain regions. Delivered across 20-30 sessions, TMS to pre-frontal cortex is a well-tolerated, NICE-approved, therapy for major depressive disorder.

Despite its popularity, there is marked variability across patients in the rate and extent of clinical improvement with TMS. We are developing an approach to augment ("boost") the effectiveness of TMS by delivering TMS in synchrony with a second non-invasive neuromodulation technique called "transcranial alternating current stimulation" (tACS). tACS delivers weak electric currents via scalp electrodes.

Methods

The aim of this initial study, in non-patients, was to examine whether tACS-synchronised TMS increases, to a greater extent than TMS alone: (1) frontal "theta" (5 Hz) brain waves (oscillations), and (2) positive "emotional bias". Greater theta oscillations have previously been associated with better response to TMS, and positive shift in emotional bias is an indicator of antidepressant efficacy.

Twenty-six non-patients received single sessions of up to four conditions (on separate days): (1) TMS + tACS, (2) TMS + sham tACS, (3) sham TMS + tACS, (4) double sham. Before and after stimulation, we measured frontal theta oscillations using electroencephalography (EEG). Twenty minutes after stimulation, participants completed an emotional bias task (judging the emotion in ambiguous facial expressions).

Results

Theta oscillations increased in power across the fifteen minutes following TMS + tACS, to a greater extent than in the other three conditions. Emotional bias was also more positive (i.e., greater likelihood of reporting a facial expression as "happy") following TMS + tACS. Dual stimulation was similarly well tolerated to TMS alone.

Conclusion

Both findings suggest tACS-synchronised TMS may have greater antidepressant activity than TMS alone. This work is now published (Briley et al., 2024). We will soon commence a multi-session study in people with moderate-severity depression to understand further the mechanism of action of tACS-synchronised TMS.

References

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, doi: 10.1162/imag_a_00073

Single-cell RNA sequencing identifies a population of GREM1 expressing stromal cells which are expanded after co-culture with specific colorectal cancer cell lines

William Dalleywater, Adam Bills, Mohammad Ilyas.

Background

Colorectal adenocarcinoma (CRC) is a leading cause of cancer-related mortality. CRC shows substantial genetic variation between different patients and within the same tumour. With sequencing technologies, it has been recognised that CRC can be broadly categorised based genetic features, for example the consensus molecular subtype (CMS1-4) system1 . CMS subtype 4 (CMS4) has a complex tumour microenvironment characterised by fibrosis and angiogenesis, and substantially worse prognosis than other subtypes. It is thought that the tumour microenvironment is one explanation for this behaviour.

Methods

We used a novel co-culture model3 where four CRC cell lines with well-defined but distinct genetic backgrounds were each cultured in-vitro with intestinal stromal cells. This allowed us to investigate early events in formation of the CRC microenvironment. After co-culture, we depleted CRC cells from the stromal cells using magnetic cell sorting with EpCAM. Stromal cells cultured alone were used as a control (n=2/condition). We next performed single-cell RNA sequencing and finally performed bioinformatic analysis to investigate stromal population characteristics.

Results

We identified a specific population of stromal cells which is expanded after co-culture with HCT116/HT29 cell lines (more aggressive) but is depleted after co-culture with CACO2/LS174T (less aggressive cell lines). This population shows high expression of GREM1, which has been associated with CMS4 and poor prognosis. Furthermore, this population shows increased expression of two specific cell surface receptors (LIFR, RYR2), which may be important mechanisms in establishing population phenotype through ligands produced by CRC cells. We have shown functional effects in CRC cells after co-culture with stroma where these expression changes led to a corresponding change in CRC cells.

Conclusion

These are highly promising observations which we are currently investigating further in our model. Understanding these mechanisms better could lead to novel strategies for targeting tumour growth by creating a tumour microenvironment which is less permissive for tumour cells.

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) Dalleywater, W., Predeus, A., Cakir, B. et al. A rapid method for generating transplantable and biologically responsive colonic tissue from human induced pluripotent stem cells. bioRxiv 2023.12.08.570795; doi: https://doi.org/10.1101/2023.12.08.570795

Publications and achievements

Work from PhD published on bioRxiv (reference above), which is undergoing review for journal submission.

The G Proteins $G_{\alpha q/11}$ and $G_{\alpha 12/13}$ Drive Unique Myofibroblast Functions to Promote Pulmonary Fibrosis

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2. Biodiscovery Institute, University of Nottingham
3. Imperial College London
4. Faculty of Dentistry, University of Toronto

Background

Pulmonary fibrosis (PF) is an incurable and progressive disease characterised by stiff scarred lung tissue. Myofibroblasts drive fibrosis through contraction, activation of transforming growth factor-β (TGFβ), and extracellular matrix generation. However, the precise mechanisms that drive the differentiation and activity of myofibroblasts are uncertain.

Signalling by G protein coupled receptors (GPCRs) has been implicated in PF, and we have previously shown that the G_{α} subunit family $G_{\alpha q/11}$ is important for stretch-induced TGFβ signalling (1). However the role of specific G_{α} subunit families in driving myofibroblast activity in PF is unknown.

Aim: Understand the role of $G_{\alpha q/11}$ and $G_{\alpha 12/13}$ in myofibroblast activity.

Methods

Wild-type (WT), $Gnaq^{-/-}$;$Gna11^{-/-}$ ($G_{\alpha q/11}{}^{-/-}$), and $Gna12^{-/-}$;$Gna13^{-/-}$ ($G_{\alpha 12/13}{}^{-/-}$) murine embryonic fibroblasts (MEFs), and human lung fibroblasts (HLFs) subject to siRNA-induced $G_{\alpha q/11}$ and $G_{\alpha 12/13}$ knockdown, were used. Cells were stimulated with lysophosphatidic acid (LPA) with or without a Rho-associated kinase (ROCK) inhibitor (Y27632), or subject to breathing-related cyclical stretch, and TGFβ signalling assessed.

MEFs and HLFs cultured on "wrinkling" silicone gels were stimulated with GPCR agonists (LPA, SFLLRN, TFLLRN, or control peptide), and time lapse images taken. Gel wrinkling was used to quantify contraction.

Results

$G_{\alpha q/11}$ and $G_{\alpha 12/13}$ knockdown both reduced LPA-induced TGFβ signalling in MEFs and HLFs. Rho-associated kinase (ROCK) inhibition inhibited LPA-induced TGFβ signalling, suggesting that cellular contraction is involved in LPA-induced TGFβ activation.

HLFs from PF donors were more contractile and had greater stretch-induced TGFβ signalling than non-diseased HLFs ($p=0.02$, $n=5$ per group). $G_{\alpha 12/13}$-deficient cells had reduced baseline and GPCR agonist-induced contraction ($p<0.05$), and $G_{\alpha 12/13}{}^{-/-}$ MEFs had an abnormal cytoskeletal appearances on immunofluorescence. Conversely, $G_{\alpha q/11}$ deficiency did not affect contractility or cytoskeletal structure.

Conclusion

Myofibroblast activity is enhanced in PF. $G_{\alpha q/11}$ and $G_{\alpha 12/13}$ mediate GPCR-induced TGFβ signalling via different mechanisms (non-contractile and contractile, respectively). Precise manipulation of these processes may reveal new treatment strategies for PF.

References

[1] Goodwin et al. Development 2023; 150(9):dev201046. doi: 10.1242/dev.201046

Academic Clinical Fellows' Oral Presentations

Characteristics and 12-month outcomes of clinically-referred children and young people at risk of bipolar affective disorder

Dr Sue Fen Tan, Dr Eleni Frisira, Chris Partlett, Grace Holt, Prof Kapil Sayal

Background

The overall prevalence of paediatric bipolar disorder (BD) is <1% in the US and between 0 to 0.1% in the UK (Sadler et al., 2017; Van Meter et al., 2019). While the prevalence is thought to be higher in children and young people (CYP) referred to Child and Adolescent Mental Health Services (CAMHS) outpatient services, their characteristics and clinical outcomes have not been widely studied in the UK.

Methods

Our participants were CYP aged 11-17 from the multi-centred STAndardised DIagnostic Assessment for CYP with emotional difficulties (STADIA) trial who completed the 'Rapidly Changing Mood/ Going Abnormally High' section of the Development and Wellbeing Assessment (DAWBA) questionnaire. The CYP were categorised into probable (n=9), less likely (n=20), unlikely (n=46), and very unlikely (n=230) for BD subgroups using the DAWBA algorithm for symptom and impact scores. We studied their socio-demographic characteristics, service use outcomes, self-harm tendencies, and functional scores at baseline, 6 months, and 12 months.

Results

The mean age of CYP at probable risk of BD was 13 (SD=1.5). They were predominantly females (89%) and white (100%) with higher socioeconomic status. This subgroup had the largest acceptance rate of index and any CAMHS referrals within 12 months (67% and 89%). They had the highest percentage of confirmed clinical diagnoses (33%) of depression, generalised anxiety disorder, social anxiety, and obsessive-compulsive disorder. The probable subgroup was most frequently offered (67%) and started on treatment within 12 months (56%). CYP in the possible subgroup also self-reported worst functional scores in conduct disorder and hyperactivity subdomains at baseline (M=5.0, SD=1.6; M=7.2, SD=1.3).

Conclusion

CYP at probable risk of BD from their DAWBA responses have high rates of emotional disorder diagnosis and are more likely to have their referrals accepted and treatment started.

References

Sadler, K., Vizard, T., Ford, T., Marcheselli, F., Pearce, N., Mandalia, D., Davis, J., Brodie, E., Forbes, N., Goodman, A., Goodman, R., & McManus, S. (2017). Mental Health of Children and Young People in England, 2017. Surrey: NHS Digital

Van Meter, A., Moreira, A. L. R., & Youngstrom, E. (2019). Updated Meta-Analysis of Epidemiologic Studies of Pediatric Bipolar Disorder. J Clin Psychiatry, 80(3). https://doi.org/10.4088/JCP.18r12180

Characteristics and 12-month outcomes of clinically-referred children and adolescents at risk of Body Dysmorphic Disorder

Dr Eleni Frisira, Dr Sue Fen Tan, Chris Partlett, Grace Holt, Prof Kapil Sayal

Background

Body Dysmorphic Disorder (BDD), characterised by excessive pre-occupation with perceived appearance flaws and repetitive behaviours1, is increasingly recognised as a disabling disorder in children and young people (CYP)2. Although it often leads to significant functional impairment, it remains underexplored2.

Methods

This study included 307 CYP aged 11-17, who completed the Development and Wellbeing Assessment (DAWBA) to measure likelihood of BDD based on their symptom and impact scores. The sample was derived from the STandardised DIagnostic Assessment for children and young people with emotional difficulties trial (STADIA). Baseline, 6 and 12-month measures were collected from parent/self-reports and healthcare records, and were descriptively analysed.

Results

CYP with probable BDD were mostly female (84%), white (89%) and came from a range of socio-economic quintiles. There was a positive association between the likelihood of BDD and DAWBA scores for social phobia, generalised anxiety and depression. CYP with probable BDD were no more likely to be accepted into child and adolescent mental health services (CAMHS) than those unlikely to have BDD. Self-harm and thoughts to self-harm were more frequent in CYP with higher likelihood of BDD at all timepoints, including at baseline with 33-48% vs 18% and 50-61% vs 35% respectively.

Conclusion

CYP referred to CAMHS for emotional difficulties with likely BDD are also at risk of co-morbid depressive or anxiety disorders and increased levels of self-harm. Despite this, BDD risk was not associated with acceptance to services, highlighting the need to raise awareness amongst clinicians.

References

1. American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

2. Krebs G, Clark BR, Ford TJ, Stringaris A. Epidemiology of Body Dysmorphic Disorder and Appearance Preoccupation in Youth: Prevalence, Comorbidity and Psychosocial Impairment. J Am Acad Child Adolesc Psychiatry. 2024 Mar 18:S0890-8567(24)00126-6. doi: 10.1016/j.jaac.2024.01.017. Epub ahead of print. PMID: 38508411.

Waiting Times for Elective Hip and Knee Replacements, an Analysis of Trust Level Data: Who Waits the Longest?

Dr Lawrence Gillam, University of Nottingham

Dr Brett Doleman, University of Nottingham

Dr John Williams, University of Nottingham

Background

Waiting times for elective services, notably trauma and orthopaedic services, have significantly risen over the past few years[1]. Other analyses note patients in the most deprived areas wait longer for their elective treatment[2]. Hip and knee replacements are among the most common operations within the NHS. We were interested to see if more patients were waiting for these operations in more deprived areas.

Methods

In combination with OHID data[3], an FOI request obtained the number of patients waiting over 18 or 52 weeks for a hip or knee replacement. The number waiting per 100,000 trust population, and the associated IMD quintile was calculated. The trend of number of patients waiting will be provided alongside a mixed-effects negative binomial regression model describing the effect of year and IMD quintile on number waiting.

Results

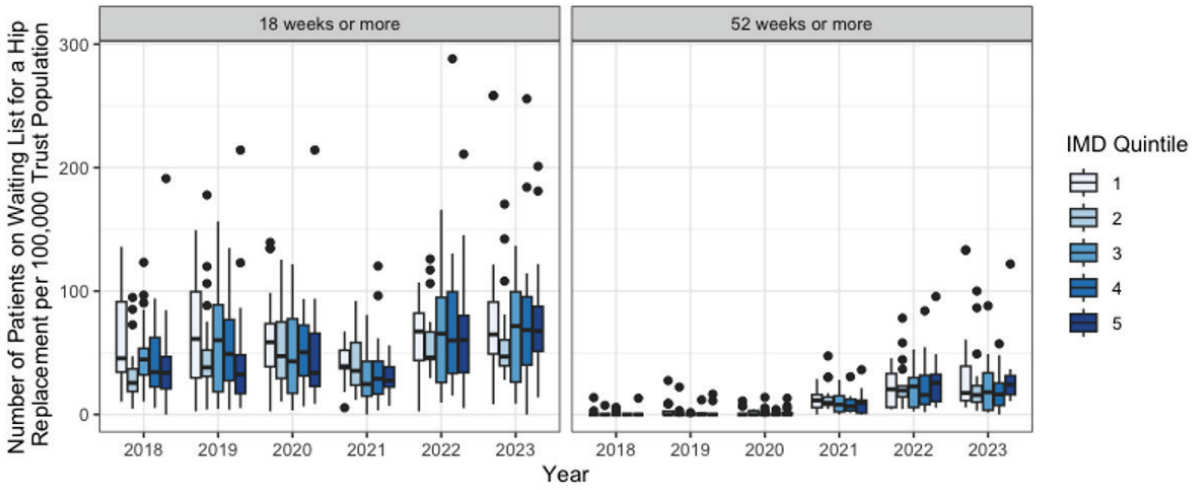
The number waiting for a hip or knee replacement has continued to rise. In 2023, there were 10,115 and 15,065 patients waiting over a year for a hip or knee replacement, respectively, having risen from 495 and 1255 in 2018. Notably, there is a significant range in number of patients waiting between trusts. Our regression model indicates that there has been a significant rise in number of patients waiting for arthroplasty over time, but this is not associated with IMD quintile of the trust.

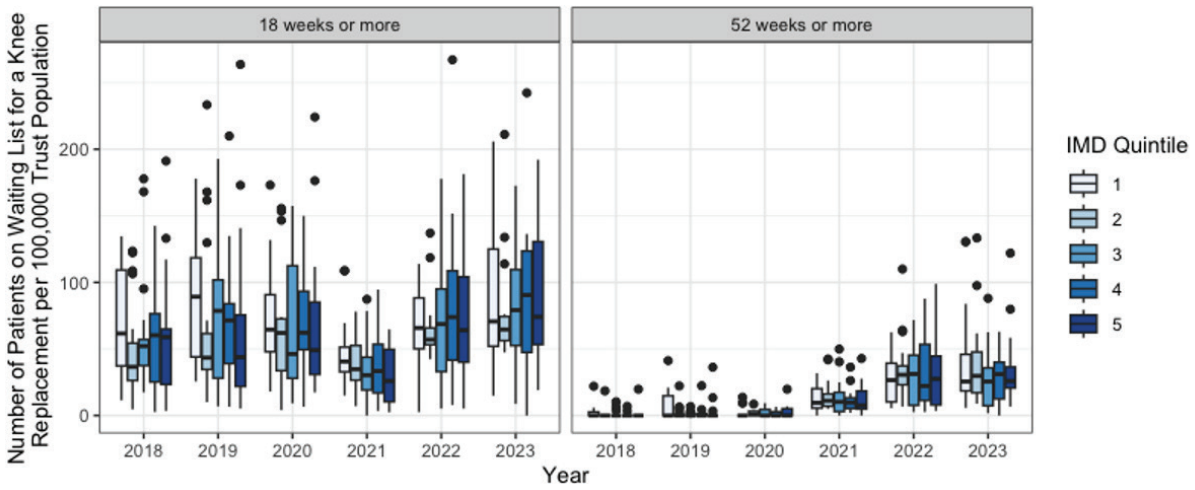
Conclusion

Despite a rising absolute number and proportion of people waiting for an elective arthroplasty: this is not influenced by the level of deprivation of the trust's population. Given this is trust level data, we plan to conduct further work examining the effect of deprivation on NHS waiting times at an individual patient level and determine if this has an impact on patient outcomes such as functional status and chronic pain.

References

1. NHS England (2024). Referral to Treatment (RTT) Waiting Times [Available from: https://www.england.nhs.uk/statistics/statistical-work-areas/rtt-waiting-times/
2. Kings Fund (2023). Unpicking the inequalities in the elective backlogs in England [Available from: https://www.kingsfund.org.uk/insight-and-analysis/long-reads/unpicking-inequalities-elective-backlogs-england]
3. Office for Health Improvement and Disparities (2022). NHS Acute (Hospital) Trust Catchment Populations. [Data Available from: https://app.box.com/s/qh8gzpzeo1firv1ezfxx2e6c4tgtrudl]


18 weeks or more
52 weeks or more
Number of Patients on Waiting List for a Hip Replacement per 100,000 Trust Population
300
200
100
0
2018
2019
2020
2021
2022
2023
Year
IMD Quintile
1
2
3
4
5


18 weeks or more
52 weeks or more
Number of Patients on Waiting List for a Knee Replacement per 100,000 Trust Population
200
100
0
2018
2019
2020
2021
2022
2023
Year
IMD Quintile
1
2
3
4
5

Characterisation of myeloid-derived suppressor cells as a therapeutic target in glioblastoma (GBM)

Dr D Scotto, Dr H Franks, Dr S Smith, Professor P Patel, Dr C De Santo, Dr A Jackson

Background

GBM is the most aggressive adult brain tumour with a high mortality rate and a poor response to treatment. The immunosuppressive microenvironment of GBM is thought to be a major barrier to effective implementation of immune-based therapeutics. Myeloid cells are the most important contributors to GBM's immune microenvironment (1). The immunosuppressive myeloid component of GBM includes tumour-associated macrophages (TAM), consisting of bone marrow-derived macrophages and tissue-resident microglia, and myeloid-derived suppressor cells (MDSC). TAM and MDSC accumulate in GBM tumours and associate with adverse clinical outcomes (2).

Aim

Map the immune landscape of GBM with a focus on MDSC and T lymphocytes (a major target of MDSC-mediated immune suppression).

Hypothesis

GBM polarises myeloid cells towards an immunosuppressive phenotype that promotes tumour immune evasion, resistance to immunotherapies and cancer progression.

Methods

1. Characterisation of GBM-infiltrating leucocytes: fluorescence-guided neurosurgical resection utilises 5-aminolevulinic acid, which is converted to a fluorescent metabolite in GBM cells, to generate fluorescent tumour cells and aid tumour excision. Non-fluorescent tumour-infiltrating immune cells may be separated from fluorescent tumour cells by flow sorting. Once isolated, immune cells will be analysed by flow-cytometry and their cytokine profile studied by multiplex cytokine assay.

2. Assessment of MDSC functional potency: MDSC generated in vitro using GBM cell lines will be studied for their ability to suppress anti-CD3/CD28-induced T cell proliferation. Later, MDSC isolated directly from surgical samples as per 1 above will be assessed by studying their ability to inhibit T cell activation in a mixed-lymphocyte reaction.

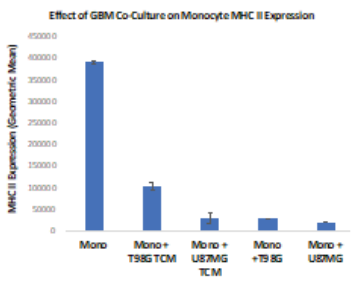
3. Mapping the distribution of MDSC, TAM and T cells: multi-regional multiplex immunofluorescence staining of GBM samples using a panel of myeloid-cell and T-cell-specific markers will enable a comprehensive assessment of the abundance, distribution, and spatial associations of different immune populations.

Preliminary Results

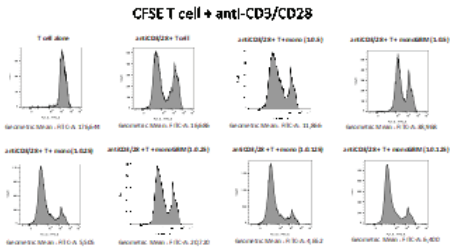
GBM polarises monocytes towards an immunosuppressive MDSC-like phenotype in vitro. GBM-conditioned monocytes display MHC receptor downregulation and inhibit T cell proliferation (Figure 1).

Figure 1: GBM polarises monocytes towards an MDSC-like phenotype characterised by MHC class II downregulation (a) and the ability to inhibit T cell proliferation (b).

a.



b.



Significance

Our results will provide insight into the contribution of immunosuppressive myeloid cells to the microenvironment of GBM, highlighting potential therapeutic targets for immunotherapies that seek to overcome the tumour's immunosuppressive network.

References

1. De Leo A, Ugolini A, et al. Myeloid cells in glioblastoma microenvironment. Cells. 2020 Dec 24;10(1):18.

2. Alban TJ, Alvarado AG, et al. Global immune fingerprinting in glioblastoma patient peripheral blood reveals immune-suppression signatures associated with prognosis. JCI insight. 2018 Nov 11;3(21).

Mother's own milk (MOM) feeding in preterm infants

Melissa-Sue Ryan, Lisa Szatkowski, Shalini Ojha

University of Nottingham, Centre for Perinatal Research, Academic Unit of Lifespan and Population Health, School of Medicine, Nottingham, United Kingdom

Background

Mother's own milk (MOM) feeding in preterm infants is associated with a reduction in rates of necrotising enterocolitis and in the incidence of sepsis [1, 2]. However it is well known that a NICU environment and the nature of the premature infant (need for respiratory support and poor sucking reflexes) make exclusive breastfeeding challenging [3]. We explore the feeding practices for preterm infants in neonatal units in England and Wales and the infant and mother characteristics associated with MOM feeding.

Methods

In this cohort study, we used whole-population data from the UK National Neonatal Research Database for infants <34 weeks' gestation admitted to neonatal units in England and Wales between 1 January 2016 and 31st of December 2022. Types of milk feeding (MOM, formula, MOM+formula) were obtained from the daily records. We examined the infant, maternal, and socioeconomic characteristics associated with exclusive MOM feeding throughout the admission, compared to exclusive formula feeding.

Results

The cohort included 90,655 infants. More infants were receiving formula feeds (39.2%) than MOM feeds at discharge (35.7%). Infants born at a later gestational age (GA) were more likely to be receiving MOM at discharge (see Figure 1).

10,194 were exclusively MOM fed throughout their neonatal stay. Infants receiving only MOM feeds were born at an earlier gestation (more likely to be very preterm vs. moderately preterm), more likely to be male, and had a longer neonatal stay (median 39 vs. 19 days) than infants who had received only formula (7506 infants). Exclusively MOM fed infants had older mothers, were of Asian or Black ethnicity, and of higher socioeconomic status (SES).

Conclusion

Rates of MOM feeds at discharge in England and Wales are low, and exclusive MOM feeding lower still. Strategies to improve this need to consider how to support younger mothers from lower SES to confidently breastfeed.

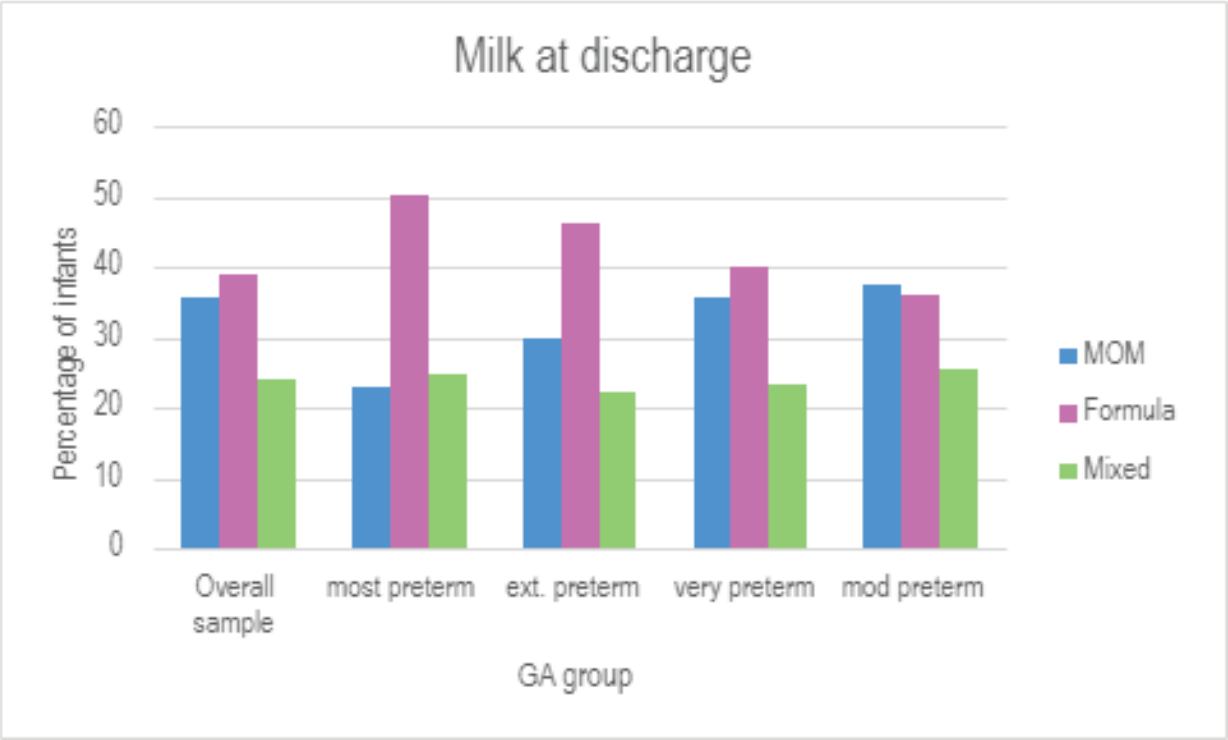
References

[1] Miller et al. A systematic review and meta-analysis of human milk feeding and morbidity in very low birth weight infants. Nutrients 2018, 10, 707-742

[2] Furman, L.; Taylor, G.; Minich, N.; Hack, M. The effect of maternal milk on neonatal morbidity of very low-birth-weight infants. Arch. Pediatr. Adolesc. Med. 2003, 157, 66–71

[3] Swanson et al. Implementing an exclusive human milk diet for preterm infants: real-world experience in diverse NICUs. BMC Pediatrics; 2023:23:237

Figure 1: Milk feeding at discharge in the overall samples and different gestational age (GA) groups. Key: most preterm = born at 22-24 weeks' GA, ext preterm = born at 25-28 weeks' GA, very preterm = born at 29-1 weeks' GA, mod preterm = born at 32-33 weeks' GA.




Clinical
Lecturers'
Posters

Non-opioid analgesics for acute pain and opioid adverse events after surgery: a Bayesian network meta-analysis

Brett Doleman, Ole Mathiesen, Alex Sutton, Nicola Cooper, Jon Lund, John Williams.

Background

Postoperative pain is a common consequence of surgery and the gold standard of treatment is non-opioid analgesia. Postoperative use of opioids to treat this pain is common but is associated with adverse events. Use of non-opioid analgesia can reduce opioid consumption and therefore opioid adverse events. Many clinical trials have been published on non-opioid analgesics, although it is as yet unknown which are the most effective. Therefore, our research question is: 'which non-opioid analgesics are most effective in reducing postoperative pain, opioid consumption and opioid adverse events after surgery?'.

Methods

We will undertake a search of published and unpublished literature for randomised controlled trials of non-opioid analgesia for postoperative pain in adult participants [1]. We estimate there will be over 500 trials included in the final analysis. We will analyse trials using a Bayesian network meta-analysis approach.

Results

As our previous analyses have identified that analgesic efficacy is dependent on baseline risk (control group pain or opioid consumption) [2], we will report estimates following a network meta-regression from a fixed baseline risk to reduce confounding. This will, for the first time, allow accurate comparison between different non-opioid analgesics.

We will also use this data to develop novel methodology in network meta-analysis including the use of interactive plots, assessment for publication bias and assessment of inconsistency in a network.

Conclusion

Our network meta-analysis will provide important clinical information regarding the most effective non-opioid analgesics in clinical practice. It will also allow identification of clinical circumstances where analgesics are most effective. Finally, the review will provide important real-world data for the development of novel network meta-analysis methodology.

References

[1] Doleman B, Mathiesen O, Jakobsen JC, Sutton AJ, Freeman S, Lund JN, Williams JP. Methodologies for systematic reviews with meta-analysis of randomised clinical trials in pain, anaesthesia, and perioperative medicine. British Journal of Anaesthesia 2021; 126(4): 903-11.

[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; 130: 719-728.

Knowing where you are going: co-producing and standardising information about Child and Adolescent Mental Health Services inpatient units

Dr Josephine Holland, Dr James Roe and Professor Kapil Sayal

Background

At-distance and out-of-region admissions form a significant proportion of inpatient admissions in CAMHS. The recent "Far Away from Home" study which investigated the impacts of these admissions for young people (YP), parents/carers (P/C) and services identified a lack of consistent, easily accessible information about inpatient units. P/C and YP reported that when they struggled to find information about a unit, this increased their distress and negative views about the admission before arrival. In contrast, those who found useful information felt more reassured about the admission, even if it was far away. Our aim was to create an expert-by-experience designed standardised template of the minimum information that all inpatient units would be required to make publicly available.

Methods

We carried out regular expert consultation meetings with YP and P/C with lived experience to co-design a standardised template of information that units would provide for young people and their families on their websites and in printed form.

Results

In early meetings the current available information was review and YP and P/C highlighted what they found helpful and unhelpful as well as what was missing. The YP and P/C then discussed the layout, aesthetics, and functionality that they would like to see on unit websites. They also identified the content which would be helpful for Y/P and their P/C individually as well as what both groups would want to know. This included realistic and practical information about the unit itself, visiting, local amenities and available funding support.

Conclusion

In collaboration with YP and P/C we have created an expert-by-experience designed standardised template of information that all inpatient units will be asked to provide on their website. Better information provision prior to admission will reduce anxiety and uncertainty for YP and their P/C. This will also contribute towards improved staff/patient/carer relationships because of clearer expectations and understanding.

Academic Clinical Fellows' Posters

A systematic review of barriers to diagnosis of vulval lichen sclerosus in primary care

Dr Louise Clarke, Rheanne Leatherland, Dr Rosalind Simpson

Background

Vulval lichen sclerosus (VLS) is a chronic, inflammatory genital skin condition causing itch, pain, anatomical changes and 22-fold increased risk of vulval cancer (1). Diagnostic delay and misdiagnosis are common. Most women present to primary care. The aim of this systematic review is to identify patients' and professionals' perspectives on barriers to diagnosis and reasons for misdiagnosis/diagnostic delay in primary care.

Methods

Separate searches of 7 databases for literature relevant to patients' (search 1) and professionals' (search 2) perspectives were conducted (December 2023). Two reviewers screened titles and abstracts with one performing full text review. Data extracted were coded 'line by line', followed by the organisation of codes into descriptive themes. These were subsequently developed into analytical themes as described by Thomas and Harden (2008). Themes generated from each search were compared with one another.

Results

We identified 320 references for search 1 and 1793 for search 2. A total of 50 studies met inclusion criteria for analysis. Inductive coding formed 13 descriptive themes which were further developed into six analytical themes:

1. Cultural and social taboos
2. Education and knowledge gaps
3. Feelings and attitudes
4. Inadequate health systems
5. A medically challenging diagnosis
6. Problems with examination of female genitalia

Similar themes were identified from both data sets, with some notable differences. A common theme identified from data on patients' perspectives was that dismissive clinician attitudes were likely to delay diagnosis. Distinct themes were also identified relating to misattribution of symptoms to lifestyle, mental health and sexual practices.

Conclusion

There are core similarities and appreciable differences in perspectives on barriers to diagnosis of VLS in primary care between professionals and patients. This review highlights potential obstacles to women in achieving a diagnosis of VLS in primary care. These results could be used as a framework to identify, research, and introduce facilitators to diagnosis.

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Reporting of concomitant and rescue topical therapies in Eczema randomized controlled trials evaluating a systemic treatment: a scoping review

Wei Chern Gavin Fong, Sophie Leducq , Hywel C. Williams, Lucy Bradshaw, Kim S. Thomas

Background

The landscape of atopic dermatitis (AD) treatment has witnessed an increase in randomized controlled trials (RCTs) exploring systemic medications. These trials often incorporate topical therapies either as permitted concomitant treatments (concomitant) or as rescue medications (rescue). Variable use of topicals post-randomisation introduces potential bias. Nonetheless, there is a scarcity of literature addressing the systematic reporting of topical therapy details in AD clinical trials. We reviewed current practices in reporting topical treatments in AD systemic medication RCTs to address this gap.

Methods

Our primary objectives included determining the proportion of RCTs that clearly report the allowance or prohibition of concomitant and rescue topical treatments. Secondary outcomes involved examining the reporting of specific parameters for these topicals, such as type, potency, duration, application quantity, and etc. We screened AD systemic medication RCTs included in the living systematic review and network meta-analysis of AD systemic treatments by Drucker et al(1) (n=83), spanning from inception to March 2023.

Results

Most trials adequately reported the allowance or prohibition of concomitant topicals (95.5%,N=64/67), but less so regarding rescue topicals (73.1%,N=49/67). All trials permitting concomitant therapies consistently reported the type, though details on potency (88.6%,N=31/35), duration (54.3%,N=19/35), application frequency (34.3%, N=12/35), and quantity (5.7%,N=2/35) were less frequently reported. Similarly, trials allowing rescue treatments often specified the type (91.2%, N=31/34) but provided limited information on potency (53%,N=18/34), duration (8.8%,N=3/34), application frequency (5.9%, N=2/34), and quantity (0%,N=0/34). In multivariate logistic regression models, the variable “publication year ≥ 2020” was significantly associated with reporting of the use of rescue topicals (adjusted odds ratio: 9.55[1.73-82.9], P<0.001).

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.

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

Thomas B. Layton Lynn Williams Nan Yang Mingjun Zhang Carl Lee Marc Feldmann Glenda Trujillo Dominic Furniss Jagdeep Nanchahal

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.

Conclusion

Overall, our results elucidate a tightly coupled vasculature niche in fibrosis that instructs the differentiation of functionally distinct stromal cells. These findings provide an important translational resource and highlight the therapeutic potential of targeting blood vessel signaling in human fibrosis.

Venous Thromboembolism in the Postoperative Period during the COVID-19 Pandemic: A Systematic Review and Meta-Analysis

Oluwademilade Merotohun, Andrew Jackson, David Humes, Christopher Lewis-Lloyd

Background

During the Coronavirus Disease 2019 (COVID-19) pandemic, global trends emerged indicating increased venous thromboembolism (VTE) incidence among postoperative patients, potentially attributable to perioperative Severe Acute Respiratory Syndrome Coronavirus-2 (COVID) infection. However, there is insufficient data on VTE incidence among postoperative patients in the context of the pandemic. This study aims to examine the global incidence of postoperative VTE during the COVID-19 pandemic.

Methods

Following PRISMA and MOOSE guidelines (PROSPERO: CRD42023460464), MEDLINE and Embase databases were searched from inception to 03/11/2023, including 4 other registered databases. 2 blinded reviewers screened studies with a third adjudicating discordance.

Inclusion criteria: All study types including single institutions reporting patients aged ≥18-years undergoing surgery during the COVID-19 pandemic. Exclusion criteria: Case reports or studies reporting <10 patients per grouping, patients aged <18-years or undergoing completely endoscopic surgery.

Outcomes were 30-day or 90-day postoperative VTE incidence rates per 1,000 person-years (pyrs) in patients with and without perioperative COVID infection circa the COVID-19 pandemic.

Results

Of 5,943 studies retrieved, 16 were available for meta-analysis reporting on 2,921,346 patients.

No significant differences were observed between pre-pandemic and pandemic pooled VTE incidence rates following Orthopaedic Total Joint Arthroplasty (TJA), Orthopaedic Other Surgery (OOS), Emergency General Surgery (EGS) or Multiple Specialty Surgery.

Pooled VTE incidence rates per 1,000 pyrs in perioperative COVID-positive compared to COVID-negative patients were significantly higher following TJA: 71 (95%CI, 47-108, I^2 97.3%) and 244 (95%CI, 110-541, I2 97.6%), OOS: 138 (95%CI, 84-229, I^2 99.4%) and 253 (95%CI, 240-266, I^2 0.0%), and EGS: 97 (95%CI, 61-157) and 474 (95%CI, 226-995), see Figure.

Conclusion

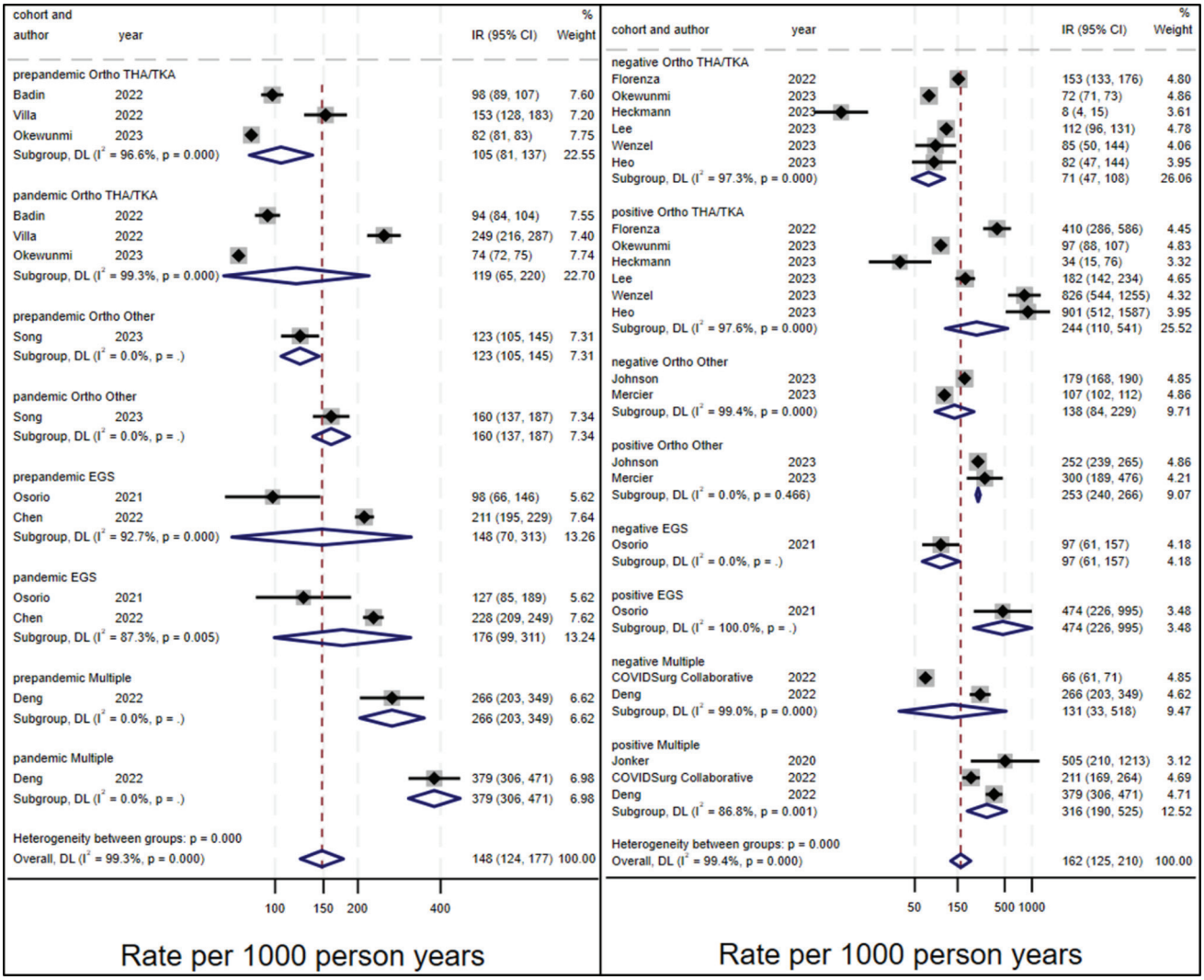
There appears an increased postoperative VTE risk in perioperative COVID-positive, particularly Orthopaedic and EGS, patients that may not be attributable to patient selection bias during the COVID-19 pandemic. However, further investigation is required to delineate postoperative VTE risk and inform future practice.

Publications and achievements

Gysling S, Lewis-Lloyd CA, Lobo DN, Crooks CJ, Humes DJ. The effect of diabetes mellitus on perioperative outcomes following colorectal resections: a national cohort study. BJA. Accepted for publication 2024.

Figure: Postoperative venous thromboembolism rates per 1,000 person-years of pre-pandemic and pandemic patients by surgical specialty (Left). Postoperative venous thromboembolism rates per 1,000 person-years of perioperative COVID-negative and COVID-positive patients by surgical specialty (Right).

IR; Incidence rate.



Association between modifiable risk factors for dementia and neuroimaging-based brain-predicted age

Dewen Meng, Alireza Mohammadinezhad Kisomi, Christopher Tench, Dorothee Auer

Background

According to the 2020 Lancet Commission on dementia prevention, intervention, and care, 40% of dementia cases could be prevented or delayed by targeting twelve modifiable risk factors throughout life [1]. Brain structure and function among individuals can be substantially different, suggesting that they change at different rates as a consequence of heterogeneity in genotype, environment, lifestyle and disease [2]. Brain-predicted age, which is the estimation of the brain biological age by applying machine learning algorithms to MRI data, has recently emerged as a reliable imaging-based biomarker of brain health [3]. The difference between brain-predicted age and chronological age (BrainAGe delta) signifies a deviation from the normal ageing trajectory and has the potential to identify risk factors that are beneficial or detrimental to brain health and thus detect potential targets for interventions [4].

Aims

The primary aim of this study is to examine the independent and cumulative effects of dementia-related modifiable risk factors on brain ageing and cognition in the middle-aged adults. Firstly, we will examine the association between each individual risk factor and BrainAGE delta to elucidate contributions of a single risk factor to this age acceleration prediction. Then we will investigate the association between combined risk factors, BrainAGE delta and cognition to examine if there is a dose-response effect of risk factors on BrainAGE delta.

Further research plans

1. Extract demographical, clinical and risk factor data from the UK Biobank.
2. Collaboration with researchers from the NIHR Nottingham BRC to get the predicted brain age data and BrainAGE delta for the UK biobank participants.
3. To conduct an exploratory analysis in a sub cohort to investigate whether the combination of risk factors will differentiate the participants with ‘young’ brain age from those with ‘old’ brain age

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Metabolomics in the diagnosis and prognostication of childhood cancers: a narrative review

Senali Y Seneviratne[1,2], Madhumita Dandapani[1,2]

Background

Cancer is the leading cause of death for children in the UK[(1)] and there remains a need to identify novel biomarkers for the diagnosis and prognostication of childhood cancers and the early detection of recurrence/relapse. Metabolomics is a high-throughput 'omics' technology which enables the identification and quantification of metabolites in a biological sample, allowing inferences to be made regarding cellular function. This review aims to evaluate current literature on the applications of metabolomics within paediatric oncology.

Methods

Literature search was carried out on Pubmed, MEDLINE and EMBASE databases using a comprehensive search strategy of MeSH keywords.

Results

Metabolomic profiling of amino acids in peripheral blood samples from patients with leukaemia using liquid chromatography-mass spectrometry was able to distinguish patients with acute lymphoblastic leukaemia (ALL) or acute myeloid leukaemia from controls.[(2)] A similar study on patients with medulloblastoma and healthy controls identified six potential biomarkers in peripheral blood for the diagnosis of medulloblastoma.[(3)] Developing less invasive diagnostic tests, reducing the need for invasive procedures in this context, could be of immense clinical value. Metabolomic profiling of bone marrow plasma samples from patients with ALL identified metabolic pathways significantly associated with minimal residual disease status, which is a strong predictor of relapse.[(4)]

Metabolomic profiling of tumour tissue samples from patients with pilocytic astrocytoma, medulloblastoma and ependymoma showed that each tumour type was characterised by a distinct metabolic signature[(5)] providing insights into tumourigenesis. Metabolomic profiling has also been shown to be predictive of outcomes in patients with neuroblastoma.[(6)]

Conclusion

Our review highlights the wide-ranging applications of metabolomics within paediatric oncology across haematological malignancies, brain tumours and other solid tumours. Applications include facilitating less invasive diagnoses, allowing risk stratification of disease, monitoring response to treatment, detecting disease recurrence/relapse, providing insights into the pathophysiology of disease and enabling the discovery of novel therapeutic targets.

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Inter- and Intra- region variation in the availability neonatal intensive care technologies across the UK

Rosalind B Simpson, Don Sharkey

Background

There is variation between UK regions in outcomes for high-risk infants. Vital neonatal care is delivered using devices. The availability of devices and technologies across a healthcare service has not previously been documented. We sought to map the UK's neonatal technology landscape and describe the inter-and intra-regional variation.

Methods

All UK units with co-located maternity services were invited to take part. Data were collected on availability, makes and models of delivery room and neonatal intensive care unit technologies via a web-based survey. Data collection took place between April and December 2023. Data are presented by unit level and by region.

Results

84% of UK units including 91% of tertiary units participated.

T-Piece ventilation and volume-targeted ventilation were among the technologies that were available at >95% of responding units. Near infra-red spectroscopy and delivery room respiratory function monitoring were among the technologies that were available at <5%. Many technologies were highly variable in their availability including video laryngoscopes and ECG monitoring of heart rate in the delivery room.

For several key technologies, there is significant variation in the makes and models in use both within and between regions. 15 different neonatal ventilators are in use in the UK and up to 9 are in use in a single region.

Conclusion

This allows individual units to benchmark their use of technology. Shared areas of best practice and areas of significant variation are highlighted including variation within units belonging to the same region and providing the same level of care. This may contribute to inequalities in care and outcomes. Other implications of variability may include learning burden for staff and anxiety for families.

Specialised Foundation Programme Doctors' Posters

Let's Get Your Patient Moving

Sherin Abdelbadiee, Melanie Paul and Bethan Philips

Background

Patients with cancer often experience significant psychological distress, including anxiety and depression, which can impact their motivation to stay active. This, coupled with poor nutrition, can increase frailty levels before surgery, affecting the postoperative course. Enhanced recovery after surgery (ERAS) aims to reduce postoperative complications and length of hospital stay (LoHS). Given that, the evidence points to postoperative movement reducing the risk of complications such as chest infections, ileus, and postoperative muscle wasting, and should be encouraged in all patients. However, amount of postoperative movement is currently variable, even within ERAS protocols. Physical rehabilitation starting immediately after surgery is integral to ERAS but lacks consistent monitoring and guidance on achievable targets for patients.

Aims:

- Primary goal: Determine if patients with lower daily step-counts during postoperative inpatient stay exhibit increased 30-day complication rates.

- Secondary objective: Investigate correlation between lower physical activity levels and higher Hospital Anxiety and Depression Scores (HADS).

Methods

This observational cohort study employed accelerometry to measure inpatient activity postoperatively. It aimed to determine if lower daily step counts during the postoperative period correlate with increased 30-day complication rates. Additionally, it explored whether total reduced physical activity levels relate to higher Hospital Anxiety and Depression Scores (HADS).

ActivPAL™ monitors measure the amount of activitity patients take do starting from the midnight of POD1, in metabolic equivalent of task in hours (MET.h), steps, sit to stands and sedentary time. The activPAL™ monitors, worn on the right anterior thigh for up to a week, are non-invasive tools. Their compact size and non-intrusive nature make these monitors valuable for auditing and categorizing immediate postoperative activity levels, including the timing of activities throughout the day. This data aids in identifying patterns and areas warranting further investigation.

Results and Conclusion

TBC

Artificial intelligence in the delivery of patient care: avatar-generated videos for patient education post breast surgery

William Adeboye[1,2], Vikramaditya Tayal[2], Elizabeth Odunbanjo[2], Ange Siakeu[2], Deborah Das[1], Sallie-Ann Young[1], Georgette Oni[1,2]

[1]Nottingham Breast Institute

[2]University of Nottingham

Background

The use of artificial intelligence has become the latest digital frontier across multiple sectors. In medicine hitherto, most of the focus has been on the use of artificial intelligence (AI) in diagnostic and training but not in the direct delivery of patient care. This study aimed to evaluate the use of Avatar-generated videos in postoperative management of patients undergoing breast surgery at a tertiary referral centre.

Methods

The wound management video content was created as part of a number of different videos designed by a multidisciplinary team using software that enables avatar in different ethnicities, dialects and languages. Over a four week period patients' were sent the video via text message alongside the standard information they were given (orally and/or via leaflet) on discharge for how to manage their wounds. After at least one week a non-validated survey was sent electronically consisting of 18 questions to evaluate how patients perceived the video in relation to the standard of care.

Results

Of the 55 responses received, 67% of patients preferred the video content. On average, 91% of patients had a better understanding of post-operative wound management. Patients were more likely to refer to the video rather than the leaflets. 24% of patients still required additional support post-discharge.

Conclusion

Our findings indicate that the use of a video as an online resource for post-operative care is practical and preferred by patients. In addition, it helps deliver consistent information to patients and can be adapted to reflect ethnicity and language.

Signs & Symptoms Predictive of CSF Shunt Dysfunction in Children & Young People Presenting to ED

Yousif Aldabbagh, Sana Riaz, Rachel Wiffin, Milo Hollingworth

Aim

To investigate signs and symptoms in children and young people (CYP), with cerebrospinal fluid (CSF) shunts, presenting to a CYP emergency department (ED) with onsite paediatric neurosurgical facilities; and assess their association with 30-day shunt revision rate.

Methods

Retrospective analysis of CYP (<17 years old) with CSF shunts presenting to the CYP ED. Univariate and multivariate analyses were performed to assess the relationship between patient characteristics, presenting signs and symptoms, and 30-day shunt revision rate.

Results

We analysed 107 presentations between 03/11/2021 and 25/10/2022. 42% of patients were female with a mean age of 5.64 years. The most common shunt aetiologies included tumour (30%) and intraventricular haemorrhage (30%). Vomiting (37%), reduced alertness (27%), and behaviour change (27%) were the most common symptoms. 13% of patients underwent shunt revision within 30 days of presentation. No individual sign or symptom was highly sensitive, with the most sensitive being headache (64%) and vomiting (64%). Univariate analysis demonstrated that ≥2 (two or more) previous shunt revisions, fever, pallor, headache, and surgical site swelling, were significantly more common in those who underwent shunt revision ($p<0.05$). However, only headache and shunt site swelling were independently predictive using multivariate analysis ($p<0.05$).

Conclusion

CYP with CSF shunts present with complex symptomatology. Number of shunt revisions, headache, and shunt site swelling were predictive of shunt revision at 30 days. Understanding and integrating key predictors of CSF shunt failure into the diagnostic pathway is essential for improving efficiency and minimising the impact on CYP and their families.

Predicting risk of major gastro-intestinal bleed associated with use of non-steroidal anti-inflammatory drugs. Development and validation of a risk model in primary care patients.

Kartikeya Bhardwaj, Anthony Avery, Ralph Kwame Akyea, Darren Ashcroft, Brian Bell, Colin Crooks, Rachel Elliott, Barbara Iyen, Amelia Taylor, Yana Vinogradova

Background

Non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used medications for their analgesic and anti-pyretic properties, with 15% of the UK population being prescribed one in their lifetime. They are however associated with significant side effects including gastro-intestinal (GI) bleeds, cardiovascular problems and impaired renal function, particularly in the older population. Observational studies have noted many factors associated with GI bleeding risks, but few have integrated them into prediction models to aid the prescriber. The aim of this study is to develop a general risk prediction model for General Practitioners (GPs) that predicts GI-bleeding for patients attending for their first instance of pain with no recent history of analgesia prescriptions.

Methods

Provided by the Clinical Practice Research Datalink (CPRD) and Hospital Episode Statistics (HES) we used routinely- collected anonymised data from GP practices across the country from January 2010 until April 2021. The patient group includes those over eighteen years of age with at least 2 years of records prior to entering the study. Patients entered the cohort at first record of pain requiring analgesia and followed up until treatment changed or until their last record on the database. Patient demographics, BMI, co-morbidities, other prescriptions, smoking status, alcohol consumption were prepared for analysis. A Cox regression model will then be used to assess the probability of the adverse outcome based on NSAID use and established risk factors. The model will undergo assessment in an external validation cohort to measure its fit, discrimination, and calibration accuracy. Sensitivity, specificity, positive predictive value, and negative predictive value will be calculated across various risk thresholds. Additionally, a decision-curve analysis will be performed.

Results

In the process of preparing the dataset for analysis.

Conclusion

Work currently in progress but aim to develop a clinical model that predicts risk of major GI bleeds in patients with no recent NSAID prescription to aid with prescribing.

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Diffusion weighted image parameters for the characterisation of untreated gliomas: a systematic review of cohort composition and techniques

Faheem Bhatti, Joachim Strobel, Nico Sollmann, Stefanie Thust

Background

As of 2016, the WHO classification of adult diffuse gliomas assesses both the molecular and histological features of gliomas.[1] Key molecular features include the IDH mutation and 1p19q co-deletion status.[1] Early classification of glioma genotype is important in guiding treatment. For example, IDH mutant/1p19q^{codel} gliomas respond to chemotherapy, whereas surgical resection is key to improving outcomes in IDH mutant/1p19q intact gliomas.[2,3]

Diffusion weighted, magnetic resonance imaging (DWI) could be used to noninvasively characterise the genetic composition of gliomas. This systematic review was performed to assess:

1) The diagnostic accuracy of DWI for glioma characterisation.

2) How published data on the diagnostic accuracy of DWI is shaped by cohort composition and measurement methods.

Methods

A systematic search of Pubmed and Embase databases was performed. Studies which assessed the performance of DWI in the characterisation of IDH mutation status and 1p19q codeletion status were included. Data extracted from relevant studies included the WHO grade composition of cohorts, the method of DWI assessment, and diagnostic performance of DWI parameters as assessed by receiver operated characteristic analysis. The quality of studies was assessed using the Quality Assessment of Diagnostic Accuracy Studies (QUADAS 2) tool and PRISMA guidelines were followed.

Results

The search yielded 833 studies of which 100 met the inclusion and exclusion criteria after being screened by two reviewers. Data extraction has been completed for 54 of the 100 papers as of 10/04/24.

Conclusion

This systematic review aims to evaluate which DWI parameters are suitable to non-invasively characterise gliomas and how the reported performance of such parameters may be affected by the cohorts they are assessed in.

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Even Mild Anaemia is Associated with Poor Outcomes in Chronic Kidney Disease

Dr Jonathan Bowley, Professor Maarten Taal

Background

Anaemia is a common complication of chronic kidney disease (CKD)[1]. Current NICE guidance advises clinicians to only investigate anaemia in CKD patients if Haemoglobin is less than 110 (g/L)[2].

Methods

Adults with CKD stage 3 were recruited from 32 primary care practices in Derbyshire, United Kingdom. Study visits were undertaken at baseline, year 1, and year 5. Factors contributing to anaemia at baseline were assessed using univariate and then multivariate binary logistic regression. The effect of several baseline factors including anaemia on cardiovascular events within 5 years and 5-year survival was assessed using Cox proportional hazards analysis. All analyses were performed using SPSS.

Results

1741 patients were recruited. The mean age of the population was 72.9±9.0, with 1052 (60.4%) female. It was an overwhelmingly (97.5%) white population. 418 (24.0%) people were anaemic at baseline, 209 (50.0%) of those were female. Most cases of anaemia were mild, with 179 (85.6%) of the male cases and 147 (70.3%) of the female cases having Hb>110. Anaemia at baseline was shown to be significantly associated with both 5-year mortality and cardiovascular events within 5 years with hazard ratios of 2.2 (1.8-2.8) and 1.5 (1.3-1.8) respectively.

Conclusion

Even mild anaemia in mild CKD patients should be interpreted as a risk marker and should prompt consideration of underlying factors. Future studies should aim to include a more diverse population to increase the representativeness of the results.

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Acceptability of chatbot-delivered psychological interventions in perinatal women: A systematic review

Salima Davlidova, Neil Nixon

Background

Many women develop mental health conditions during perinatal period. The chatbot technology is relatively new, but rapidly evolving and might become even more significant in the way mental health is supported (Ogilvie el al. 2022, Laranjo et al., 2018). It is important to understand how this technology is accepted by the end-users, what are ethical considerations, potential risks (inappropriate advice, privacy concerns, triggering exacerbations) as perceived by the users.

Methods

Databases searched: MEDLINE, EMBASE, PsycINFO, CINAHL, Web of Science, Emcare. The search strategy included two concepts: chatbot; perinatal women. Psychological interventions – cognitive behavioural therapy (CBT), interpersonal therapy (IPT), mindfulness-based, interpersonal, narrative therapies; psychoeducation. Participants: pregnant women + 12 months postpartum. Intervention: use of chatbots for psychological interventions. Method of synthesis: both, quantitative and qualitative, data were extracted. If quality and heterogeneity of data allows meta-analysis of quantitative and meta-synthesis of qualitative data will be conducted.

Results (in progress)

Three studies were identified (see PRISMA chart) and showed various acceptability measurements: Client Satisfaction Questionnaire (CSQ-8); Working Alliance Inventory Short - Revised version (WAI-SR); frequency of use over 2-weeks; percentage of users engaged post-registration; number of active days (Green et al., Inkster et al., Suharwardy et al.).

Conclusion (in progress)

Low number of academic articles on the topic available as only three articles meeting criteria were yielded during the search process. Meta-analyses were not possible to perform due to heterogeneity of used acceptability measurements. There is a need for using more unified acceptability measurement system as chatbot technology is rapidly evolving in the view of artificial intelligence (AI) development and high likelihood of these services being used more intensively.

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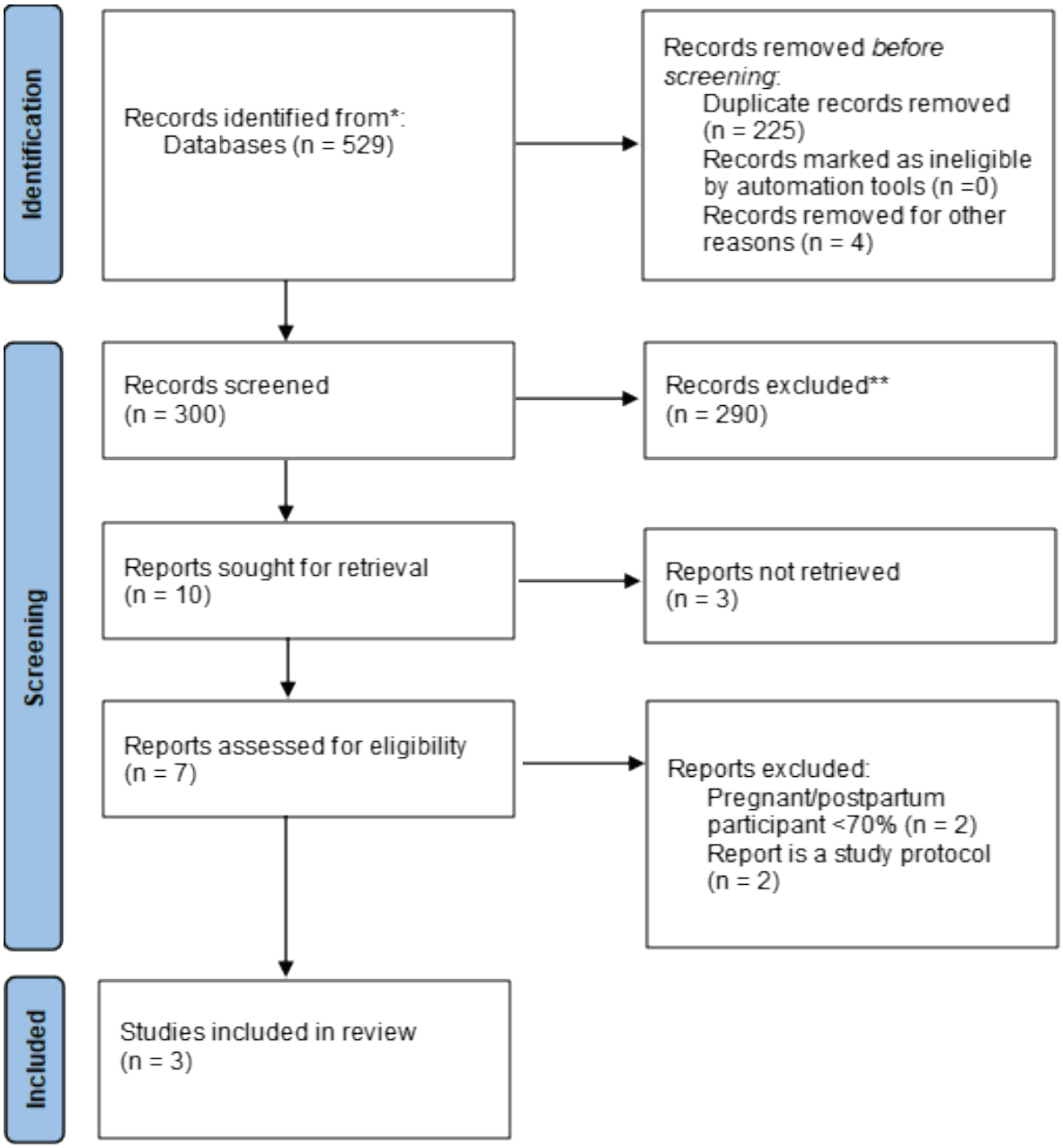
Identification
Records identified from*:
Databases (n = 529)
Records removed *before screening*:
Duplicate records removed (n = 225)
Records marked as ineligible by automation tools (n =0)
Records removed for other reasons (n = 4)
Screening
Records screened
(n = 300)
Records excluded**
(n = 290)
Reports sought for retrieval
(n = 10)
Reports not retrieved
(n = 3)
Reports assessed for eligibility
(n = 7)
Reports excluded:
Pregnant/postpartum participant <70% (n = 2)
Report is a study protocol
(n = 2)
Included
Studies included in review
(n = 3)

Motor Unit Discharge Threshold is Repeatable Across Serial Muscle Contractions in Older People

Callum Eve, Abdulmajeed Altheyab, Bethan Phillips, Mathew Piasecki

Background

The coordinated activation of skeletal muscle is essential for human movement. Increases in contractional force are influenced by the motor unit firing rate (MUFR) and the recruitment of motor units, where recruitment refers to the force threshold at which a motor unit is activated (1). With ageing, there is reduced muscle mass and function, known as sarcopenia. This is caused by a reduction in motor unit numbers with the remainder undergoing remodelling, resulting in increased motor unit size (2-3). If the recruitment threshold varies, there would be variability in motor unit activation and thus inconsistent force production. Recent advances in high-density electromyography (HD-EMG) enable quantification of MU activity in humans, and the tracking of individual MUs across successive muscle contractions. This study aims to ascertain whether there is variability in recruitment thresholds across serial contractions in elderly patients.

Methods

Sixteen older people took part in this study. Maximal dorsiflexion was recorded, followed by a series of trapezoid contractions at 25% of maximum, with a targeted ramp up and down phase. HD-EMG signals were recorded from the tibialis anterior and decomposed and cleaned to represent induvial MU spike trains. All MUs and corresponding spike trains were tracked across contractions. Multi-level regression models were generated to explore differences across contractions.

Results

Across serial muscle contractions, there was no significant difference in motor unit recruitment thresholds. Thus, in the elderly, motor unit activation is repeatable across contractions.

Conclusion

Motor units are activated at the same stage of contraction repeatedly and therefore this does not result in variability in force of contraction. The reduced functional capacity is due to the reduced firing rate and reduced number of motor units.

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Advance Diffusion Models for Brain Tumours

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Background

Advanced diffusion models in MRI imaging have emerged as promising tools for characterizing brain tumours, offering insights into tissue microstructure and cellular organization beyond conventional diffusion-weighted imaging (DWI). These models utilize sophisticated mathematical frameworks to analyse diffusion patterns and provide valuable information about tumour heterogeneity, aggressiveness, and treatment response. This abstract aims to review the application of advanced diffusion models in MRI imaging of brain tumour patients, highlighting their potential benefits and clinical implications.

Methods

A comprehensive literature search was conducted using the electronic database PubMed. Keywords such as “diffusion MRI,” “diffusion kurtosis,” “brain tumour,” “glioma,” “cell density, and “microstructure” were used to identify relevant studies published within the last 10 years. Studies were transferred to an application software, Rayyan, for abstracts screening based on exclusion criteria: no advanced diffusion models, simulation only, no brain tumour, no tissue analysis performed, review articles, <5 patients, no English full text. This was performed by 2 reviewers and any discrepancies were resolved by a senior consultant radiologist. Full text review was conducted for included studies and data such as MRI acquisition, advanced diffusion models, parameters studies, patient demographics and key results of studies were extracted onto Excel by 2 reviewers. Evaluation of bias of studies was performed alongside data extraction using the QUADAS 2 framework.

Further Research Plans

Extracted data will be reviewed by medical physicists and results from the studies will be collated before commencement of the write up.

Conclusion

Motor units are activated at the same stage of contraction repeatedly and therefore this does not result in variability in force of contraction. The reduced functional capacity is due to the reduced firing rate and reduced number of motor units.

Ethnic inequities in genomics and precision medicine

Bains M, Qureshi N, Bajwa RK, Leonardi-Bee J, Hassanein ZM, Hassan S, Jayes L, Bogdanovica I

Background

Precision medicine strives to understand human genetic variation in populations and individuals with the aim of developing tailored therapies (1). However, minoritised ethnic groups are hugely underrepresented in genomics and precision medicine research, with evidence further downstream of inequities in access to genomic medicine services that are developed as a result (2).

Methods

- A UK-based policy and guidance document review, exploring the extent to which ethnic inequities are acknowledged in documents related to the field of precision and genomic medicine.
- A systematic review to identify ethnic inequalities in precision medicine, focusing on recruitment biases in research and patient access to genomic medicine services.
- Qualitative research to gather views of stakeholders regarding current knowledge, understanding and practice relating to genomics research and genomics service provision.

Results

Policy and Guidance Review:

- 50 UK based documents were identified and reviewed.
- Qualitative themes: Ethnicity in relation to precision and genomic medicine, data recording on ethnicity, efforts to engage ethnic minority groups, health service and system level recommendations.

Systematic review:

- 143 included studies (137 quantitative, six qualitative)
- Ethnic minority participants accounted for 6.56% of the total participant population across all included studies.
- Qualitative analysis revealed themes of- barriers to access and engagement and exclusion of ethnicity in genetic risk prediction models.

Stakeholder Analysis:

- 98 participants from different ethnic and professional backgrounds.
- Thematic analysis- improving knowledge and awareness, barriers and facilitators to access services and research, community engagement, monitoring equity of access and workforce training.

Conclusion

- Community engagement- to effectively mainstream and embed precision medicine within the health service for all.
- Policy and practice- development of national Equality Diversity and Inclusion frameworks.
- Research- Need for development of ethnically diverse genetic databases to improve understanding of genetic variation.
- Workforce training- a drive to improve the genomic education of prospective and current health professionals.

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An investigation into the acceptability of the SAFER-YMH care bundle for transitions out of CAMHS Crisis and Liaison services

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Background

CAMHS Crisis and Liaison teams are designed to give intensive short-term support to young people experiencing mental health crisis and aim to reduce the need for hospital admission. However, when the time comes to be transferred out of these teams it can be a point of increased vulnerability where young people and their families can lack support and information about ongoing care.

The SAFER-YMH care bundle has been developed to improve discharge from adolescent mental health units. This study will assess the acceptability and necessary adaptations for this bundle to be used by CAMHS Crisis and Liaison teams.

Methods

Focus groups were conducted with seven stakeholder groups (CAMHS crisis and liaison practitioners, young people, parents, NHS managers, commissioners, and IT professionals). The seven 'stage 1' focus groups each used one set of stakeholders to ensure that participants could speak freely.

At the three 'stage 2' focus groups the adapted tool was presented to mixed groups to ensure that all were happy with this version and to capture discussion between stakeholders. All discussions were recorded and transcribed verbatim. The data were analysed using normalisation process theory.

Results

Focus group participants were able to describe current transition practices out of CAMHS Crisis and Liaison teams and their experiences of these. The SAFER-YMH tool was presented, and participants discussed how they would like it to be adapted for use in Crisis and Liaison Teams. There was a focus on how the bundle could enhance current practice without increasing clinician workload.

Conclusion

Through the integration of stakeholder feedback, a version of the SAFER-YMH bundle has been created for use in transfers out of CAMHS Crisis and Liaison Teams. The next steps include a trial of implementation to assess whether introduction of this care bundle improves experiences of transfers out of these teams.

PRocessed Electroencephalography Monitoring in mechanical thrombectomy for acute Ischaemic StrokE: a pilot observational study (PREMISE)

Dr David Hewson, Dr Alex Mankoo, Dr Kailash Krishnan, Dr Mark Barley, Dr Luqman Malik, Professor Philip Bath, Dr Michael O'Donoghue

Background

Acute ischaemic stroke (AIS) is a leading cause of UK mortality (~20% within 1 year) and disability (>50% survivors) [1]. Mechanical thrombectomy (MT) for large-vessel occlusion (LVO) improves outcomes and is recommended in UK and international guidelines [2,3]. However, >50% patients are either dead or disabled at 6 months despite radiologically successful vessel recanalisation [4,5]. This implies radiological evidence of vessel recanalization alone is insufficient to determine subsequent stroke recovery. General anaesthesia (GA) is commonly administered to facilitate MT in the UK [6] and emerging evidence suggests that GA is associated with superior recanalisation rates and functional outcome compared to local anaesthesia or conscious sedation [6]. However, GA is associated with abrupt, unpredictable and profound alterations in cerebral blood flow, cerebral metabolic rate, systemic blood pressure, heart rate and cardiac output. Clinicians do not know the utility of processed electroencephalography (pEEG) monitors in AIS undergoing MT under general anaesthesia.

Aims

This study protocol outlines a pilot observational study which aims to find out if data obtained from routine pEEG monitoring in people with strokes undergoing MT can identify any changes in brain electrical activity during the procedure, whether these changes are related to responses to the treatment and whether they can be used to predict recovery and survival.

Methods

The primary outcome measure will be mean intra-procedural pre-canalisation pEEG index in ischaemic and non-ischaemic hemispheres. Secondary outcome measures will include additional pEEG markers and patient outcome measures. Descriptive statistics will summarise relevant disease, procedural and participant characteristics. Within-subject intra- and inter-hemispheric differences in quantified pEEG parameters (index, BST) will be analyzed by the Wilcoxon signed-rank test. Postprocedural secondary outcomes will be collected for hypothesis-generation only and will not be suitable for comparative statistical analysis. Data will be validated, cleaned and analyzed by Dr Mankoo under the supervision of Professor Hewson.

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Which therapist factors are associated with fidelity of delivering a vocational rehabilitation intervention in the ROWTATE (return to work after trauma) randomised controlled trial?

Ritter J, Holmes J, Lindley R, Radford K, Wright-Hughes A, Kendrick D.

Background

Vocational rehabilitation (VR) supports people to remain in or return to work. The ROWTATE (return to work after trauma) randomised control trial is testing the clinical effectiveness of a VR intervention in patients with moderate or severe trauma. As part of this trial, intervention fidelity will be measured. Fidelity is defined as the extent to which intervention delivery adheres to the protocol (1). It is key in determining the internal validity of the intervention and thus, whether the intervention is truly effective (2). The RETAKE (return to work after stroke) trial shows intervention fidelity is positively associated with return to work. The amount of mentoring received by occupational therapists (OTs) delivering the intervention was also significantly associated with fidelity (3). This study will further explore the relationship between therapist factors such as competency and mentoring time with intervention fidelity in the ROWTATE trial.

Methods

Focus groups were conducted with seven stakeholder groups (CAMHS crisis and liaison practitioners, young people, parents, NHS managers, commissioners, and IT professionals). The seven 'stage 1' focus groups each used one set of stakeholders to ensure that participants could speak freely.

At the three 'stage 2' focus groups the adapted tool was presented to mixed groups to ensure that all were happy with this version and to capture discussion between stakeholders. All discussions were recorded and transcribed verbatim. The data were analysed using normalisation process theory.

Results

Findings will be presented describing therapists' attributes, competency scores, intervention fidelity, mentoring attendance and therapist factors associated with fidelity.

Conclusion

This study will improve our understanding of factors associated with the fidelity of a vocational rehabilitation intervention delivered by OTs and CPs for patients after trauma.

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What factors affect the spread of a falls prevention programme?

Amar Shukla, Elizabeth Orton, Jodi Ventre, Denise Kendrick

Background

Falls in older adults are a major health problem, leading to injuries, fear of recurrence and loss of independence. One in three older adults fall at least once a year, costing the NHS £2.3bn. [1] Falls can be prevented by improving strength and balance.[2] The Falls Management Exercise (FaME) programme is effective in reducing falls,[3] but FaME provision varies across the UK. This study identifies factors affecting spread of FaME in two demographically distinct areas.

Methods

As of writing, 9 semi-structured interviews have been carried out with stakeholders in Greater Manchester and Devon. Interviews focus on factors affecting the decision-making process around commissioning and adoption of FaME. Framework analysis was used with themes mapped to the 'Consolidated Framework for Implementation Research' (CFIR).

Results

Study analysis is ongoing. Preliminary themes emerging include:

1. Adoption and spread is facilitated when falls is a strategic priority locally, leading to cohesive commissioning across NHS and local authority leisure sectors.
2. Conversely, maintenance of provision (rather than expansion) is more likely where there is less strategic join-up, and funding availability is ad-hoc.
3. Expert groups such as Falls Collaboratives, and local co-ordination and leadership roles such as Falls Leads, play an important role in engaging commissioners and ensuring delivery meets local need.

Conclusion

More cohesive healthcare services are needed to deliver and spread innovations; where Integrated Care Systems work as intended, they may facilitate this by connecting healthcare, leisure providers, and local experts, and creating a joint spending plan.

Connections between national, regional, and local experts are necessary to ensure sufficient priority and funding is given to falls prevention nationally, but also that spending power remains local to allow services to meet local needs.

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