

Riverina Medical & Surgical Symposium

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2020

Riverina
Medical &
Surgical
Symposium

Posters & Presentations

- Research Undertaken in the Riverina
- Updates in Practice
- Controversies in Practice

Saturday, 3 October 2020
Virtual Symposium via Zoom



THE UNIVERSITY OF
NOTRE DAME
AUSTRALIA



Health
Murrumbidgee
Local Health District



Riverina Hospital



DREAM
MENTORING

Introduction

Welcome to the Riverina Medical and Surgical Symposium! This event showcases research projects and innovations in medical science from the spectrum of medical specialties currently established in the Riverina. The Symposium has been founded to bring medical professionals from across these specialties together to share emerging ideas and innovations and celebrate our achievements as the medical fraternity in the Riverina.

In recognition of these achievements, there are a number of prizes that will be awarded. These include Young Investigator Awards in Orthopaedics, Critical Care, Medicine, Surgery, Radiology, Bioethics/Public Health, Bioethics, Infectious Disease, and Zoonotic Disease.

The Overall Young Investigator Award will be selected from the best of these nine young investigator awards after a short presentation from each candidate.

Format for the morning

09:00am - Symposium opens

09:00am - Welcome

09:10am - Poster Presentations

10:30am - Young Investigator Award presentation of prizes
and symposium summary

10:45pm - Close of Symposium

Congratulations to those presenting at the Symposium today. Thank you to our esteemed judges, including Dr Lachlan Weir, Dr Hannah Kempton, Dr Jacob Koestenbauer, for their valuable time. Thanks, also, to our sponsors for their generosity. We hope you enjoy this event.

RMSS Committee & Convenors

A/Professor Joseph Suttie, Simon Paton, Timothy Bemand, Mandy Kaur, Muhammad Khan, Adil Lathif, Geoffrey Murphy, Hannah Ryan, Daniel Tardo, and many others.

Abstracts

Hypotension, Adrenal Crisis and Age

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Context

Adrenal crises (AC) are episodes of severe adrenal insufficiency (AI) with hypotension. They cause morbidity and mortality in patients with Addison's disease [primary adrenal insufficiency (PAI)]. AC is defined by hypotension and symptoms and signs of AI, which includes confusion, acute abdominal symptoms, and electrolyte abnormalities. Misclassification of AC episodes is a common problem, particularly in patients with hypertension whose relative hypotension may go undetected.

This phenomenon is of particular importance in older AI patients, whose risk of poorer outcomes is compounded by under-recognition of cardiovascular compromise and increased burden of co-morbidities

Objective

To determine the effect of utilising relative hypotension (sBP decrease greater than 20mmHg) to define an AC diagnosis in estimating the true incidence of episodes, particularly in estimating age-specific AC incidence.

Methods

A retrospective study of paired systolic blood pressure (sBP) measurements in hospitalised patients with PAI, pre and post treatment of AI/AC. Patients included for analysis were those with PAI and an acute

medical illness admitted to a large regional hospital for urgent treatment between 2000 and 2017. Measurements included a comparison between sBP on arrival at hospital and on discharge. Hypotension was classified as either absolute hypotension (sBP 100mg or lower) or relative hypotension (sBP over 100mg but at least 20mmHg lower than discharge sBP).

Results

There were 152 admissions with paired blood pressure measurements. Of these, 46 (30.3%) included a record of a medically diagnosed AC. Absolute hypotension was found in 38 (25.0%) records, and a further 21 (13.8%) patients were classified as having relative hypotension. Patients aged 65 years and older had the lowest (14.8%, n=8) proportion with absolute hypotension but the highest (27.8%, n=15) with relative hypotension. Use of absolute and relative hypotension as the criterion for AC diagnosis increased the proportion of patients with an AC by 28.3% and the proportion of patients with an AC in the oldest age group by 130%.

Conclusions

Using absolute hypotension (sBP < 100mmHg) to define AC fails to detect cardiovascular compromise in a subgroup of older AI patients, underestimates the true rate of ACs in this group, and may result in delays in essential treatment. Relative hypotension should be assessed in all ill patients with AI.

Cross-Cultural Workers in maternity care in South-Eastern Sydney Local Health District: staff surveys and interviews

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6. The George Institute for Global Health, Sydney, Australia

Background

Pregnancy is a time of heightened risk for migrant and refugee women in Australia, with poorer perinatal outcomes arising from issues including access to services and health service inequities. This study evaluates a Cross-Cultural Workers (CCW) service that was implemented in local maternity care services to improve migrant and refugee women's and children's health. This study aimed to explore the experience of healthcare professionals (HCPs) with referral to, and use of, CCW in maternity care, to identify areas of strength and possible improvement.

Methods

Within a service evaluation framework, a mixed-methods study using surveys and interviews 12-24 months after implementation of the CCW model was conducted. HCPs, including nurses, midwives, and medical practitioners were surveyed regarding their satisfaction with the CCW model and suggestions for improvement. Semi-structured interviews with the CCWs and HCPs were then performed to receive feedback on the CCW

model and recommendations for improvement. Survey data was analysed descriptively, and interview data was analysed inductively.

Results

69 surveys and 19 interviews were completed. Strengths of the service were the perceived improved care for women, and ability of the CCWs to act as a 'bridge' to health. A limitation of the service was the part-time hours of CCWs, reducing their ability to perform the role and fully implement the model. The major suggestion for improvement was increased CCW hours.

Conclusions

The CCW Service was highly regarded by the HCPs, with staff evaluating it to be of crucial importance in providing pregnancy care for migrant and refugee women.

Subacute thyroiditis linked to SARS-CoV-2 infection

Elizabeth Monk, Suzannah Bownes, A/Prof Joseph Suttie

Purpose

Subacute thyroiditis (SAT) refers to post-viral inflammation of the thyroid. SAT is typically characterised by an episode of thyrotoxicosis, followed by a period of hypothyroidism and ultimately return to euthyroidism. There are emerging case reports describing SAT post-SARS-CoV-2 infection.^{1,2,3,4} This is an evolving area of interest as the pandemic continues to unravel and an understanding of the sequelae of infection with SARS-CoV-2 comes to light.

Methods

Case presentation of a 34-year-old female who presented with grossly diffuse neck swelling and deranged thyroid function tests following confirmed infection with SARS-CoV-2. Coronavirus disease (COVID-19) symptoms included fever, cough, widespread myalgia, shortness of breath on exertion and heavy central chest pain with left sided pleuritic chest pain. Symptoms were conservatively managed with no specific treatment and her recovery is still ongoing 5 months post infection. She was not hospitalised.

Result

Thirty-two days following the onset of upper respiratory symptoms, the patient developed profound neck swelling and tenderness with symptoms of upper airway obstruction when lying supine. At this time, the patient was self-isolating in a remote location, and therefore no physical examination was performed.

The patient reported weight loss, fatigue and cervical tenderness with a diffuse and tender goitre. Biochemical evaluation a week following symptom onset showed suppressed TSH (0.44mIU/L, Ref 0.5-4.0).

Thyroid ultrasound performed 6 weeks after symptom onset revealed a multinodular goitre with right lobe measuring 13cc and the left lobe 7cc. Multiple spongiform nodules were present in the right lobe but were not reported as suspicious. No more formal investigations were performed, and symptoms were conservatively managed with ongoing monitoring. Around this time serological testing for SARS-CoV-2 confirmed recent infection with significant IgG antibodies present (80AU/ml). 8 weeks after the onset of symptoms, biochemical thyroid function had returned to baseline and thyroid antibodies were not significant. Although the cervical tenderness had subsided, her goitre remains. To date she is still experiencing symptoms of fatigue and breathlessness, most likely due to a post viral syndrome

Conclusion

Here we report a case of subacute thyroiditis post-infection with SARS-CoV-2. Clinicians should be aware of the thyroid manifestations potentially associated with COVID-19.

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2. Mattar, S. A. M., Koh, S. J. Q., Chandran, S. R., & Cherng, B. P. Z. (2020). Subacute thyroiditis associated with COVID-19. *BMJ Case Reports CP*, 13(8), e2373336.
3. Muller, I., Cannavaro, D., Dazzi, D., Covelli, D., Mantovani, G., Muscatello, A., & Cuzzocrea, M. (2020). SARS-CoV-2-related atypical thyroiditis. *The Lancet Diabetes & Endocrinology*, 8(9), 739-741
4. Ruggeri, R. M., Campenni, A., Siracusa, M., Frazzetto, G., & Gullo, D. (2020). Subacute thyroiditis in a patient infected with SARS-CoV-2: an endocrine complication linked to the COVID-19 pandemic. *Hormones*, 1-3.

Recurrence of Takotsubo cardiomyopathy post-ECT: Shocking insight from the literature

Evelyn Wilkins, Caterina Klasen,
Dr Daniel Tardo, A/Prof Joseph Suttie

Abstract

Takotsubo cardiomyopathy (TCM) is a transient akinesis of the left ventricle commonly involving the apex, which is typically induced by severe physical or emotional stressors. TCM is being increasingly recognised as a rare but serious complication of electroconvulsive therapy (ECT).

The precise mechanism of this phenomena remains unclear, although some merit is given to a hypothesis involving coronary artery spasm caused by catecholamine surge. It has been established that individuals with conditions amenable to ECT, such as depression and chronic anxiety, have higher baseline levels of catecholamines and altered neuron catecholamine reuptake secondary to pharmacological interventions. It has been shown in the literature more than half of the documented cases of TCM occur in patients with a history or acute episodes of a neurological or psychiatric condition. Additionally, ECT has specifically been linked with increased catecholamine release, thus further predisposing patients to developing TCM.

Whilst rates of recurrence are low, details pertaining to TCM recurrence post ECT are likely to be inaccurate due to lack of follow up and appreciation of subtle TCM symptomatology. A single study has reported recurrence of 1 in 6 patients, however this lends itself to a small data set and no statistical analysis, which is a common problem in the literature. If further

ECT is required, this must not occur until left ventricular function normalises on repeat echocardiogram, with some evidence

for use of angiotensin receptor blockers or angiotensin converting enzyme inhibitors from a preventative perspective. Evidence for the use of beta-adrenergic antagonists is less well established but may reduce the adrenergic response in this context.

A banana a day keeps wound failure away: A study evaluating the utility of fruit, pig skin and synthetic skin for suturing practice

Geoffrey Murphy, Muhammad Khan, Adil Lathif, John Preddy

Background

Suturing is a fundamental skill for surgery and emergency medicine. Suturing is taught from medical school and throughout surgical training. However, the opportunity to practice and perfect suturing is limited by the ethical dilemma of training on patients, and a lack of access or availability of synthetic skin or cadaveric animal skin.

Fruit skin, such as that of bananas and oranges, have been proposed as suitable and accessible alternatives to cadaveric animal or synthetic skin for suturing practice. However, few studies have analysed how similar these are to suturing human skin and only one study has compared them to another form of practice suture material (foam skin). Moreover, all previous studies on suturing on these materials have focused on describing how suturing proficiency has changed, not on how accurately these materials simulate the experience of suturing in human skin. Nor have any of the studies compared how different suture types such as simple, vertical mattress and subcuticular compare for the different materials.

This study aims to explore how comparable different fruit skins (orange and banana), synthetic skin and pig skin are to the experience of suturing on human skin. To our knowledge, this is the first study to investigate this. The comparability of the different skins will be determined by a

questionnaire completed by surgical and emergency consultants and trainees who will attempt several different sutures on the 4 materials (test skins).

Methods

Emergency and surgical consultants and trainees will be contacted via email and invited to attend a session to suture the materials and assess their experience of suturing the materials. During the sessions, each participant will suture each of the 4 materials (banana skin, orange skin, pig skin and synthetic skin) using 3 different sutures (simple, vertical mattress and subcuticular). The similarity of the experience to suturing human skin and whether they would recommend this material as a practice material will be assessed using a Likert scale. Participants will also be asked if the material simulates a particular area of human skin.

Implications

We hope the results from this study will assist with medical education and improve surgical training by directing medical students and trainees as to which materials they should practice on for each suture type.

Audit on the perceptions of the impact of Covid-19 and department support amongst emergency healthcare workers at Wagga Base Hospital

Philippa Harrison, Alec Hope

Introduction

The COVID-19 pandemic has created an unprecedented challenge for the public healthcare system and those who work within it. The first positive case of COVID-19 in the Murrumbidgee Local Health District (MLHD) was confirmed on the 23rd of March, and case numbers continued to rise. Recognising how the threat of COVID-19 could increase levels of pressure and anxiety amongst health-care workers, and induce concerns about physical and mental health, we sought to assess the prevalence of these concerns amongst staff members who worked in the Emergency Department (ED) at Wagga Wagga Base Hospital (WWBH). Whether participants felt they had a sound understanding of COVID-19 related protocols, and levels of perceived support within the ED, were also assessed. We hypothesised that as the number of cases in the MLHD increased, rates of self-reported anxiety and concerns regarding mental and physical health would increase.

Methods

We conducted a cross-sectional observational study using de-identified self-reported seven-point surveys, which were distributed to ED staff in April and May. Data was extracted manually from the surveys, and was managed and analysed using Stata. Data analysis was performed by the investigators, with chi-square testing used to assess for differences in agreement with the seven statements using

comparisons between April and May surveys, as well as between doctors and nurses, and junior and senior staff.

Results

One hundred and twenty four surveys were completed. Sixty five were completed in April, and 59 in May. Thirty surveys were completed by doctors, 72 by nurses and 22 by administrative staff. Forty-eight surveys were completed by staff who identified as senior, 37 by junior staff and 39 did not designate a level of seniority.

Around half of all survey participants reported increased levels of pressure and anxiety at or regarding work. Approximately one third expressed concerns about their own mental health in April, however, in May there was a significant decline in these concerns. Over three quarters of respondents reported having a good understanding of the COVID-related health and safety protocols in both April and May. Respondents almost universally felt well supported by the Wagga Base Hospital Emergency Department.

Subgroup analyses showed higher rates of concern about mental health amongst junior staff compared to senior staff in April, but there was no difference between the groups in May. Nurses were also more likely to report a better understanding of the health and safety protocols in May when compared to doctors. Further, nurses were more likely than doctors to report feeling well supported by the WWBH Emergency Department in May, although the rate of this perception of support was over 80% in both groups, and across both timeframes.

Discussion

This study was able to demonstrate clear differences in concerns about work-related pressure, anxiety, physical and mental health, understanding of health and safety protocols, and perceptions of support from

the ED amongst staff. Despite concerns about selection and measurement biases, we found significant differences in the rates of concerns about mental health amongst junior and senior staff, and we hypothesised this may be related to the protective effect of experience for senior staff.

We had hypothesised that as cases COVID-19 increased, rates of concern about anxiety and pressure would increase, but instead we found the inverse to be true. We found that levels of concern about mental health were reduced amongst all participants between April and May as the threat of the pandemic appeared to become more manageable and the curve of case numbers was flattened in New South Wales. Nursing staff reported higher rates of understanding of the health and safety procedures than doctors in May. We speculated this could be due to more structured clinical and procedural handovers we observed on the floor in the Emergency Department every shift change, which could, in turn, facilitate better understanding and high rates of perceived support among nurses, than their doctor counterparts.

Conclusion

In light of the second-wave of COVID-19 in Victoria and in many health jurisdictions throughout the world, we anticipate an ongoing need to monitor and support healthcare workers given high rates of concern about mental and physical health. We hypothesise that that a spike in cases could correspond with higher rates of concern, and healthcare services should be aware that junior staff may be more likely to report mental health concerns than their senior counterparts. Further, dedicated time for clinical and procedural handover is likely to lead to high self-reported levels of understanding of health and safety protocols amongst healthcare workers. This may translate to higher rates of perceived

support from the healthcare service.

Is timing of superior labrum anterior to posterior (SLAP repair important? A cohort study evaluating the effect of the duration of symptoms prior to surgery on the outcomes of patients who underwent type II SLAP repair

Geoffrey Murphy, Patrick Lam,
George AC Murrell

Background

An initial period of non-operative treatment is often advocated for superior labrum anterior to posterior (SLAP) lesions. However, while studies have shown non-operative treatment to significantly improve patient's functional outcomes, many patients still require surgery after this period of non-operative treatment (15-51%). SLAP repair is a commonly advocated surgical treatment for SLAP tears which significantly improves patients shoulder function and pain. However, to our knowledge there has been no study that has analysed if the duration of time from symptom onset to surgery affects patient outcomes. The purpose of this current study therefore was to determine the benefit or not of having an early SLAP repair. We hypothesised that early SLAP repairs would be associated with improved functional outcomes.

Methods

Sixty-one consecutive arthroscopic superior labral repair cases performed by a single surgeon were retrospectively reviewed using prospectively collected patient-ranked outcomes and examiner-determined assessments pre-operatively, at 1 week, 6

weeks, 24 weeks and at a minimum of 2 years after surgery. Patients were allocated to an 'early repair' or 'late repair' group based on their time between symptom onset and surgery.

Results

Of the 61 patients, 22 patients (36%) had surgery within 6 months or sooner from symptom onset. Postoperatively, both groups had similar improvement up to 6 months, although 'early repair' patients had less range of external shoulder rotation at 6 weeks post-repair compared with 'late repair' patients (32 vs 45, $p = 0.01$). By >2 years after surgery 'early repair' patients had reduced level of pain and reduced difficulty with overhead activities (mild vs moderate, $p = 0.002$), reported less shoulder stiffness (none vs a little, $p = 0.001$) and were more satisfied with their shoulders' than 'late repair' patients ($p = 0.04$). 'Early repair' patients were able to return to a higher level of work earlier than 'late repair' patients ($p = 0.01$).

Conclusions

This study suggests that patients who undergo SLAP repair within 6 months or less of symptom onset have better long-term functional outcomes and an earlier return to a higher level of activity at work.

Glenoid Labral Tears are associated with increased neurofilament innervation

Geoffrey Murphy, Julia Beretov, Salman Marvi, Patrick Lam, Fiona Bonar, George AC Murrell

Glenoid Labral Tears are associated with increased neurofilament innervation

Background

The glenoid labrum is a fibrocartilaginous structure that runs circumferentially around the rim of the glenoid fossa. It provides stability to the glenohumeral joint and is an attachment site for the glenohumeral ligaments and the long head of biceps tendon. Tears can occur in the anterior labrum, superior labrum, posterior labrum or any combination of the three. Pain is a common presenting feature of symptomatic labral tears, particularly superior anterior to posterior (SLAP) tears. The cause of pain in symptomatic labral tears is unknown. We aimed to determine if there is a differential expression of nerve fibres around the glenoid labrum and if torn labra have increased neuronal expression compared to un torn labra.

Methods

Labral tissue was collected at 3, 5, 9 and 12 o'clock during total shoulder arthroplasty. Samples were also collected at 3, 5 and 12 o'clock during rotator cuff repair, anterior labral repair, type II superior labral anterior to posterior (SLAP) repair and capsular release for idiopathic capsulitis. Sections were immunostained with antibodies to neurofilament, a specific neuronal marker which is used to identify central and peripheral nerve fibers, and the concentration and intensity of immunostained-positive nerves assessed.

Results

The concentration of neurofilament staining was similar in the superior, anterior, posterior and inferior glenoid labrum in un torn labra (8 nerves/mm², $p > 0.05$). Torn labra exhibited a 3-4-fold increase in neuronal expression which was isolated to the location of the tear in SLAP ($p = 0.09$) and anterior labral tears ($p = 0.02$). The concentration of nerves in torn glenoid labrum samples were comparable to the glenoid labrum of adhesive capsulitis samples ($p > 0.05$).

Conclusions

This study showed that there is little variation of nerve expression between the superior, anterior, posterior and inferior glenoid labrum in un torn labra. Torn labra exhibited increased neuronal expression throughout the glenoid labrum, particularly at the site of the tear. This study supports the hypothesis that following a traumatic tear of the anterior or superior labrum, the labrum in that region becomes populated with new nerve fibres and that these fibres are likely to be responsible for many of the symptoms, particularly pain noted by patients with SLAP and/or Bankart tears.

Target organ changes at 6 months and 2 years following pre-eclampsia - the p4 study

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Background

Preeclampsia commonly involves the kidneys and liver, and increases the risk of future cardiac and renal disease. The impact of preeclampsia on future liver function is unknown. We report cardiac, renal and hepatic function at 6-months and 2-years postpartum in women with prior normotensive pregnancy (NP) or preeclampsia (PE).

Methods

In the ongoing, prospective P4 study, 302NP women and 90PE women were assessed at 6-months, and 94NP women and 39PE women at 2-years postpartum. Demographic data and medical history were recorded. At each assessment, biometric measures, blood and urine samples were collected, and blood pressure monitoring was performed. Transthoracic echocardiograms were performed in a sub-group (6-months n=54NP, 43PE).

Results

PE had greater left ventricular mass index (51.6v57.7, NP v PE, p=0.006) at 6-months. E/A ratio was lower (1.6v1.4, NPvPE, p=0.015) and E/E' ratio was higher (7.4v8.8, NPvPE, p=0.002) at 6-months. Peripheral pulse pressure was higher in PE at 6-months (39.7v42.7mmHg, NPvPE, p,0.001) but not 2-years (40.4v40.5mmHg, p=0.95)

Urinary albumin:creatinine ratio was higher in PE at 6-months (1.9v2.2, NPvPE, p=0.017) but not at 2-years (1.0v0.8, NPvPE, p=0.62).

ALP (77.6v83.3 U/L, NPvPE, p=0.03) and GGT (14.5v20U/L, NPvPE, p= 0.009) were higher at 6-months. There were no differences at 2-years.

Conclusion

Preeclampsia was associated with differences in BMI, blood pressure, cardiac structure and diastolic function, ACR, pulse pressure and LFTs at 6-months but not at 2-years post-partum. The 6-month difference may be relevant to future risk of metabolic, cardiovascular and renal disease in these women.

Characterising cell intrinsic and whole body metabolic effects of metformin in prostate cancer

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Background

Metformin inhibits PCa growth; however, its mechanism of action has been controversial. Cancer cells display altered metabolism which fuels their proliferation. The resulting metabolites could play a role in oncogenic signalling or serve as potential biomarkers for advanced PCa. We therefore aimed to: 1) identify the metabolic and signalling pathways involved in the anti-tumour effect of metformin in LNCaP cells and plasma samples from PCa patients treated with metformin; 2) predict prognostic outcome by identifying metabolic biomarkers in plasma samples.

Methods

Cell viability was determined using cell counting kit 8 (CCK8) assay on androgen-dependent LNCaP cells. Western blot was used to examine signalling pathways regulated by metformin. Untargeted metabolomics profiling of plasma samples taken from metformin treated PCa patients was performed using liquid chromatography mass spectrometry (LC-MS) to examine whole body metabolic effects. The metabolic pathways affected by metformin treatment were identified using MetaboAnalyst 3.0. One-way or two-way ANOVA was performed for the statistical analyses of in vitro data, while a paired t - test was used for statistical analysis of

plasma metabolites levels.

Results

Either metformin or the anti-androgen enzalutamide alone inhibited LNCaP cell growth in a dose and time dependent manner, while a combination of both resulted in the most significant inhibition in cell growth. Metformin stimulated AMP activated protein kinase (AMPK), and downregulated insulin-like growth factor 2 (IGF2) expression, resulting in decreased androgen receptor (AR) signalling and Akt activation. The combination of metformin and enzalutamide produced the most significant activation of AMPK and reduction in IGF2 expression, AR signalling and Akt activation. Metformin treatment in PCa patients was associated with significant upregulation of leucine ($p = 0.0436$), isoleucine ($p = 0.0282$), hydroxybutyrylcarnitine ($p = 0.0121$) and downregulation of citrulline ($p = 0.0164$). The two most significantly affected pathways by metformin in vivo that were identified were aminoacyl-tRNA synthesis biosynthesis and arginine biosynthesis.

Conclusion

We discovered a novel mechanism for the PCa growth inhibitory effects of metformin via the reduction of IGF2 expression and consequently the reduction in PI3K/Akt/mTORC1 signalling and AR signalling. Metformin treatment in PCa patients was associated with significant up or down regulation of various plasma metabolites which could be markers of metformin inhibition of tumour growth or response to metformin.

Efficacy of Patient-Sided Breath Shields for Slit-Lamp Examination

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Purpose

To evaluate the efficacy of patient-sided breath shields in preventing oronasal droplet transmission during slit-lamp examination.

Design

Experimental study testing the efficacy of patient-sided breath shields on a slit-lamp.

Methods

Two commercially available patient-sided breath shields and a 3D-printed shield designed by the authors were attached to a slit-lamp chin rest for testing. Each shield was exposed to three standardised sprays of coloured dye from a spray gun, with its nozzle adjusted to simulate the angular dispersion of a human sneeze. Any overspray not blocked by the shields was recorded and compared to spray with no shield (control). Image-processing software was used to ascertain the surface area of overspray with comparison to the control.

Results

With typical use, both commercially available patient-sided shields and the 3D-printed shield blocked 100% of forward travelling measurable droplets from a simulated sneeze spray. Even when set to the furthest distance setting to simulate the worst-case scenario, shield 1 and the 3D-

printed shield blocked 99.96 and 99.65% of overspray, respectively. However, slow-motion footage did reveal that a considerable amount of spray rebounded off the shields and extended peripherally past its borders.

Conclusions

With typical use, all tested shields prevented 100% of oronasal transmission. To encourage accessibility, we offer a free 3D model and instructions for creating the tested patient-sided breath shield. Patient-sided shields should be combined with other infection control measures to minimise transmission.

Shot through the heart: A rare cause of asymptomatic Vn

Suzannah Bownes, Thomas Goubar, Daniel T. Tardo, Joseph J Suttie

Abstract

Chronic intramural cardiac foreign bodies are a rare cause of asymptomatic ventricular arrhythmias.

We report the case of a 54-year-old man referred for optimisation of cardiac risk factors on a background of hypertension and hypercholesterolaemia, with an incidental finding of frequent ventricular ectopy of varying morphology during stress echocardiogram despite normal resting 12-lead-electrocardiogram. Subsequently, a 24-hour Holter monitor was performed which demonstrated 511 ectopic beats with one run of non-sustained ventricular tachycardia lasting 11 beats, despite remaining asymptomatic during the period of recording. At this time additional history was elucidated, indicating previous penetrating shrapnel injury whilst hunting at the age of 15, resulting in multiple foreign bodies becoming embedded in the myocardium. Plain chest radiograph showed multiple radio-opaque fragments throughout the mediastinum, confirmed on CT coronary angiogram which also excluded coronary artery disease as a possible cause of his burden of ventricular arrhythmias.

This case report is the first description in the literature of this rare clinical entity, which presents ongoing challenges surrounding the long term management of a complex issue in an otherwise young, healthy and active male.

The natural history of untreated breast carcinoma metastatic to the eyelids: A case report

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Abstract

Metastases to the eyelids are rare and most frequently originate from lobular breast carcinomas. This case represents the first description of breast cancer metastatic to the eyelids treated with only high dose intravenous vitamin C therapy and no medical or surgical treatment, therefore adding to the foundation of information pertaining to metastatic periocular disease. Recognition of isolated bilateral eyelid lesions as a sentinel presentation for metastatic disease is an important consideration to avoid misdiagnosis. Increasing awareness of the natural history of breast cancer metastatic to the eyelids may better inform patients who may elect not to proceed with oncological treatment. The natural history of metastatic lobular breast cancer in this patient treated with high dose Vitamin C demonstrated progressive spread to all four eyelids and death from systemic complications eight months after initial presentation. Ultimately this will assist clinicians communicating the potential prognosis associated with no oncological treatment and empower patients to make informed decisions regarding their care goals.

HOCUS POCUS in the ED - Hygienic Operation, Cleanliness, and Unsafe Storage of Point-of-Care Ultrasound within the Emergency Department

Emily Hancock, Dr Richard Chatoor,
Dr Michael Davoren, Gillian Ophel,
Dr John Preddy, Dr Syed Omar Harris

Background

Point-of-care ultrasound (POCUS) has become an essential piece of diagnostic equipment in emergency departments around the world. However, concerns have been raised as to whether POCUS machines could act as a vector for bacterial and viral transmission when aseptic guidelines are not adhered to.

Methods

An observational audit was conducted on the POCUS machines within the Wagga Wagga Base Hospital (WWBH) Emergency Department (ED) assessing cleanliness and safe storage. Additionally, random bacterial swabs were taken from the ultrasound probe to identify bacterial contamination. Finally, interviews were conducted with WWBH ED staff to evaluate current knowledge and implementation of the Australasian Society for Ultrasound in Medicine (ASUM) guidelines and to identify reasons for poor compliance.

Results

Our study has clearly demonstrated that adherence with ASUM guidelines for cleaning and sterilising POCUS between patients is inadequate with potential for cross infection and nosocomial infections. Used ultrasound gel, dirt and blood were observed visually on the POCUS machine

transducers at the time of inspection 37%, 23% and 7% respectively. Furthermore, several potentially pathogenic bacteria were isolated from swabs taken from ultrasound probes prior to use. Finally, we found that the most commonly identified barriers to ASUM guideline adherence were - a lack of education regarding cleaning guidelines and a lack of cleaning equipment.

Conclusion

Compliance with the ASUM guidelines regarding POCUS reprocessing is poor and lower than a level that is clinically acceptable. Incorrect sterilisation and hygiene practices may facilitate bacterial transmission with the potential for nosocomial infections and possibly adverse patient outcomes. The main barriers identified were lack of education and cleaning equipment. We would suggest that an education program should be developed and delivered to all clinicians using POCUS in order to increase compliance with ASUM guidelines. Furthermore, appropriate cleaning equipment should be available to be used prior to patient contact. These recommendations are analogous to hand washing between patient contact.

Illicit Drug Use During Pregnancy: Examining Neonatal Outcomes

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Background

Illicit drug use during pregnancy may result in serious medical implications for the neonate. There is a paucity of literature available regarding the specific effects of maternal illicit drug use during pregnancy, especially in rural centres. The aims of this study were to determine neonatal outcomes and maternal characteristics associated with illicit drug use during pregnancy in a regional setting.

Methodology

A retrospective cohort study was conducted. Neonates born from 2014-2019 at Wagga Wagga Base Hospital were included in the study. The sample population consisted of 186 neonates known to be exposed to illicit drugs. Outcomes were compared to a control group consisting of 186 randomly selected neonates not known to be exposed to illicit drugs.

Results

Results indicated that neonates exposed to illicit drugs in utero were more likely to be premature (12% vs 5%), have lower birth weight (2993g vs 3387g), higher rates of admissions to the special care nursery (36% vs 17%) and higher rates of neonatal abstinence syndrome (13% vs 0%). These results were all statistically significant. Maternal characteristics that were significantly associated with illicit drug use during pregnancy included younger women (26 years vs 29 years), lower gravida (1 vs 3), less antenatal visits (9 vs 12), more likely

to smoke tobacco during pregnancy (81% vs 21%), higher rates of hepatitis C (18% vs 0%), less likely to be married (37% vs 73%) and less likely to have private health cover (0% vs 19%).

Conclusion

This study indicated acute neonatal outcomes associated with illicit drug use and the complications related to these outcomes. This allows for preparation and anticipation of potential long-term complications. This study highlights the need for further interventions, particularly regarding antenatal care, that reduce maternal illicit drug use and mitigate its complications.

Genetic Ataxias: querying a lifelong diagnosis

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Dr Taylor Scott, Professor Paul Finucane

Background

Friedreich ataxia is a rare autosomal recessive disease within the group of hereditary ataxias. It is commonly caused by a mutation of the frataxin encoding gene, which results in the repeat expansion of GAA trinucleotide repeat within chromosome 9q13. Clinical manifestations of the disease depend upon the number of GAA expansions and interruptions by non-GAA repeats, as well as the size of each GAA expansion. In contrast, Spinocerebellar ataxia is an autosomal dominant cause of hereditary ataxia. Spinocerebellar ataxia commonly involves a repeat expansion mutation of the CAG encoding gene, with over 30 recognised variants of the disease.

Case

We report the case of a 72-year-old female resident of a high-level care nursing home who demonstrated clinical signs of global incoordination (dysarthria, bilateral dysidiadochokinesia, bilateral dysmetria), nystagmus, pronator drift, reduced tone, power and reflexes of the upper and lower limbs, as well as pes cavus and scoliosis. The onset of incoordination occurred at the age of 21 years and resulted in a purported diagnosis of Friedreich ataxia, without confirmatory genetic testing.

During her recent admission, the historical diagnosis of Friedreich ataxia was queried due to the relatively late presentation of the patient's symptoms, as well as her advanced age and ongoing functional capacity. The patient's family pedigree identified five additional family members

affected by similar physical disabilities and four with possible diagnoses of Spinocerebellar ataxia, but also without confirmatory genetic testing.

A CT brain demonstrated findings consistent with cerebellar atrophy and both Frataxin and Spinocerebellar gene screens were conducted in an attempt to confirm the underlying cause of her ataxia. The Frataxin screening test indicated that our patient is unlikely to be affected by Friedreich ataxia due to a low number of GAA nucleotide repeats. The Spinocerebellar gene screen is still pending and is hoped to provide diagnostic certainty for the patient. We anticipate that a positive Spinocerebellar test result will have far-reaching implications for our patient's relatives who could be carriers or affected individuals. Nevertheless, we recognise the limits of genetic testing and acknowledge that a definitive diagnosis is often unable to be provided to patients affected by hereditary ataxias.

Bilateral Salpingo-Oophorectomy at the time of hysterectomy for benign conditions: Patterns and factors influencing procedure rate

George Mallat, Dr Maria Quartararo, Jonathan Larach

Background

In women undergoing hysterectomy for benign gynaecological conditions, prophylactic bilateral salpingectomy (BS) and bilateral salpingo-oophorectomy (BSO) may significantly reduce future ovarian cancer risk. In light of this evidence, rates of opportunistic bilateral salpingo-oophorectomy (BSO) have been decreasing internationally over the last 10 years, due to concerns surrounding the adverse effects of premature surgical menopause.

Aims

To examine the pattern of adnexal procedures in addition to hysterectomy for benign conditions and to explore factors which may have influenced this pattern.

Materials and methods

Using NSW Health APDC data between the financial years 2000/01 – 2012/13, annual rates of bilateral salpingo-oophorectomy were calculated. Chi-square analysis was performed to explore associations. Binary logistic regression analysis was performed to identify factors that influence rates of BSO

Results

There was an overall small increasing trend in rates of BSO over the study period. The odds of undergoing BSO were independently ($p < 0.05$) increased by rural

hospital location (compared with metropolitan hospitals), acute or district private hospital type (compared with principal referral and public hospitals), abdominal route of hysterectomy (compared with laparoscopic and vaginal route), a principle diagnosis of endometriosis (compared with leiomyoma and pelvic organ prolapse), and older age (compared with women <25 years old).

Exploring rates of pre-admission polypharmacy amongst geriatric patients at Wagga Base Hospital

Timothy Bemand, Sarah Thomas, Paul Finucane

Objectives

Polypharmacy in the elderly is associated with adverse outcomes including cognitive decline, falls, and even death. Falls risk increasing drugs (FRIDs) include those with anti-hypertensive, psychotropic and anticholinergic properties. We sought to describe the extent of polypharmacy and use of medications associated with increased falls risk in the very old admitted to Wagga Wagga Base Hospital during two months in 2019.

Design

Cross-sectional study of consecutive patients aged over 80 years admitted to Wagga Wagga Base Hospital over September and October 2019. Baseline demographic data and medication usage (including FRIDs and anticholinergic burden) on admission was collected through review of electronic medical records. Polypharmacy was defined as use of five or more medications.

Results

Information on medication use was available for 391 patients. Their mean age was 86.7 (\pm 4.6) years, 56.3% were female and median length of hospitalisation was 4 days. Overall 84.7% of patients experienced polypharmacy and this increased to 87.4% of those aged 90 or above. The mean number of medications on admission was 8.5 (\pm 4.4) overall. 91.0% of patients were taking at least one FRID with the mean number being 2.8 (\pm 1.8).

Anti-hypertensives were the most commonly used FRID (78.5% of patients), and the anticholinergic risk scale was positive in 26.9%.

Conclusions

Polypharmacy is extremely common among elderly patients at the time of acute hospitalisation in a regional setting. This study highlights the opportunities for clinicians to engage in medication rationalisation to reduce potential medication-related harm.

Pigeon Fanciers Lung: Hypersensitivity pneumonitis in domestic bird carers

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Dr Daniel T. Tardo

Abstract

Pigeon fancier's lung is a leading cause of hypersensitivity pneumonitis which remains under-diagnosed worldwide. It is an IgE mediated lung disease which occurs when a susceptible individual is repeatedly exposed to airborne avian antigens often found in the excrement and feathers of birds. While it is an uncommon condition, hypersensitivity pneumonitis is a key differential in those presenting with chronic or severe dyspnoea, and those working in close contact with birds. Interestingly, not all individuals who are exposed to environmental triggers develop a hypersensitivity reaction. This is postulated to involve genetic factors and a two-hit model of pathogenesis, much like many immune mediated reactions. Diagnosis is supported with a thorough history and confirmed through specific avian and pigeon antibodies, eosinophilia and exclusion of other common causes of breathlessness.

We present the case of a 19 year old female with a week long history of dyspnoea on a background of severe asthma. Her symptoms were not relieved by salbutamol and were accompanied by a productive cough and wheeze. Collateral history revealed that she cared for a pigeon for some months prior to her presentation. On examination, the patient was found to be in respiratory distress. She was sedated, intubated and commenced on piperacillin-tazobactam, azithromycin and

hydrocortisone. Her chest CT revealed ground glass appearance in all lobes and early airspace opacity in the right hilum. Haematological studies revealed raised eosinophils and neutrophils. Avian, budgerigar and Pigeon antibodies are currently in progress. Predominant cytology of bronchial washing specimens showed eosinophils, lymphocytes and Charcot-Leyden crystals consistent with eosinophilic disease process. Her condition improved with the administration of glucocorticoids.

This case demonstrates a typical clinical presentation of eosinophilic hypersensitivity pneumonitis, an important cause of dyspnoea in the context of specific environmental exposures.

A sweet masquerade: liquorice stools

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Background

Liquorice, whilst used for centuries as a traditional medicine in a range of cultures, is associated with a range of adverse effects. There is a well described association with the syndrome of apparent mineralocorticoid excess (SAME) due to the active component of liquorice (glycyrrhizin) causing inhibition of 11-beta hydroxysteroid dehydrogenase and subsequent increase in serum cortisol (Omar et al., 2012). This can lead to severe hypertension and hypokalaemia. Previous case reports of liquorice toxicity include complications of severe hypertension, including hypertensive emergency (Falet, Elkrief, & Green, 2019) and posterior reversible encephalopathy syndrome (O'Connell, Kinsella, McMahon, Holian, & O'Riordan, 2016). Other case reports have described hypokalaemia with subsequent myopathy and arrhythmias (Panduranga & Al-Rawahi, 2013), rhabdomyolysis (Liew & Lee, 2017), peripheral oedema and heart failure. In addition, due to inhibition of CYP-450 enzymes liquorice can cause a number of drug interactions including notably with warfarin and digoxin (Omar et al., 2012).

However, despite being a described phenomena, and experienced personally by one of the authors after consuming 200g of liquorice, the authors are only aware of two case reports describing liquorice causing black stools (Liu, Srivatsa, & Kaul, 2010; Picca, 1979), and there is no published data about the expected doses of confectionary liquorice required to cause apparent melaena ("pseudo-malanea").

Aims

To explore the average quantity of liquorice needed to be consumed that leads to black discoloration of stools mimicking melaena.

Methods

In the long and noble tradition of self-experimentation in medicine, the authors undertook a ramped dose toxicology study consuming increasing quantities of liquorice and observing for change in stool colour that could be confused as melaena. All authors participating were healthy and well, with no history of gastrointestinal bleeding, ordinarily normal bowel motions, and experience in healthcare such that they could recognise stool that appeared to mimic melaena. Exclusion criteria included pre-existing hypertension, use of oral iron supplementation, use of medications metabolised by CYP-450 pathway.

Generic Woolworths Liquorice Twists were used containing 1% liquorice root extract. Doses used were 100g, 150g, 200g, 250g, 300g and 350g. After 72 hours post consumption of one dose, if no change in stool colour was observed the next higher dose was taken. If black stool discoloration was observed, the next dosage was taken after stools returned to normal colour. Primary outcome was the dose of liquorice required for 50% of participants to observe stool change consistent with melaena.

Results

Nine individuals were invited to participate and share authorship, only five expressed interest.

Four of the five authors commenced the study, and three completed the protocol to consume 350g liquorice; one author consumed a maximum of 150g liquorice.

No participants observed any changes in their stools over the study period that would be confused as melaena, therefore the

primary outcome of dose required for 50% of participants to experience pseudo-melaena could not be determined.

There were no reported adverse events or deaths.

Discussion:

It was surprising and unexpected that despite large doses of black confectionary liquorice intake, there were no observed changes in stool colour. It is likely that variations in types and relative concentrations of additives and liquorice ingredients may mean that a different result is obtained with repeat testing using a different brand.

Our difficulties in finding coauthors willing to consume moderate to large quantities of liquorice highlights the divisive nature of liquorice as a confectionary item..

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Pneumatosis cystoides coli in a patient with Stage IV diffuse large B cell lymphoma

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Summary

A 49-year-old female with a background of stage IV diffuse large B-cell lymphoma and subsequent graft-versus-host disease from a bone marrow transplant.

Presented to a rural referral hospital in New South Wales, Australia with a 12-hour history of 4-5 episodes of painless per rectal (PR) bleeding and fever. On examination she had a soft, but distended abdomen.

Laboratory investigations revealed thrombocytopenia [$26 \times 10^9/L$] and hypokalaemia [2.9 mmol/L]. Following a computed tomography (CT) of her abdomen and pelvis, it was found that she had pneumatosis cystoides coli ranging from the ileocaecal junction to the mid-transverse colon. Given her benign abdominal examination, her management was initially supportive with intravenous antibiotics, intravenous fluid resuscitation and correction of electrolyte abnormalities.

Given the unusual CT appearance and the rarity of the condition, we felt that this case was worthy of discussion.

Outcomes of concomitant lateral extra-articular tenodesis in hamstring anterior cruciate ligament reconstruction in a high-risk population with minimum two-year follow-up. A case series

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Background

Australia has the highest incidence of anterior cruciate ligament reconstruction (ACLR) and ACLR revision in the world. It is proposed that the addition of lateral extra-articular tenodesis (LEAT) in ACLR reduces anterolateral rotational instability, thereby reducing loads on the ACL graft and minimising re-rupture rates. There is no clear consensus regarding specific clinical indications for addition of LEAT to ACLR. Current evidence shows significant heterogeneity with regards to patient populations, surgical technique and rehabilitation protocols, making it difficult to draw conclusions about its efficacy. This case series characterises a high-risk subset of patients who have undergone ACLR with LEAT. Clinical indicators for concomitant LEAT included an ACL-deficient knee with high-grade pivot shift plus one or more risk factors associated with ACL graft failure. This series contributes a homogenous data set to the evidence base for future systematic reviews and meta-analyses with the goal of improving the management of

patients undergoing ACLR who are deemed to be at 'high risk' of ACL graft failure and subsequent revision surgery.

Purpose

To characterise graft survivorship, clinical examination findings and patient-related outcome measures in a specific 'high-risk' cohort of patients undergoing ACLR with LEAT using the modified Lemaire technique.

Study Design

Retrospective descriptive case series; Level IV evidence

Methods

A total of 128 patients underwent ACLR with LEAT between June 2015 and July 2017. All patients had experienced knee trauma with signs of ACL rupture on clinical, radiographic and MRI examination. Clinical indications for concomitant LEAT included one or more of the following: Grade 2+ pivot shift; age < 20 years; family history of ACL rupture; history of prior contralateral ACL rupture or revision surgery; generalised joint hypermobility (Beighton score > 4); genu recurvatum > 10°; plan for return to high-level pivot or contact sports or deemed unlikely to comply with full rehabilitation protocol. Patients with multi-ligament injury or previous high tibial osteotomy were excluded. Patient demographics were collected at baseline. The primary outcome was graft failure (re-rupture or revision). Secondary outcomes (assessed preoperatively and at 24+ months postoperatively) included range of motion, instrumented assessment of anterior tibial translation, pivot shift and patient-reported responses. These were collected using the International Knee Documentation Committee (IKDC) score, Knee injury and Osteoarthritis Outcome Score (KOOS) and Tegner Activity Scale (TAS). Complications, including hardware irritation or contralateral

ACL rupture, were also recorded.

Results

Nine patients (7.8%) suffered an ACL graft rupture and three ruptured their contralateral ACL during the study period. Patient-reported outcome measures (PROMs) showed statistically significant ($p < 0.001$) and clinically meaningful improvements. Postoperative clinical measurements showed restoration to full range of motion by 12 months, and side-to-side comparison of anterior tibial translation showed a mean difference of $1.6 \pm 0.3\text{mm}$. The preoperative Grade 2+ pivot shift was eliminated in all except one patient. Twelve patients were lost to follow-up (9.4%).

Conclusion

This case series characterises a 'high-risk' cohort of patients with high-grade pivot shift and at least one or more factors associated with risk of ACL graft failure. It shows that the addition of an LEAT with ACLR using the modified Lemaire technique has a graft failure rate comparable to that outlined in the overall literature and reduces rotational laxity as measured by pivot shift, with no impact on range of motion (ROM).

Lyssavirus: Bat-borne disease in Australia

Caterina Klasen, Claudia Suttie,
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Abstract

Australian Bat Lyssavirus (ABLV) is found in 1-7% of flying foxes, fruit bats and microbat species in Australia. ABLV is the only lyssavirus endemic to Australia and has caused at least 3 deaths since its identification in 1996. ABLV is a single-stranded RNA virus belonging to the rhabdoviridae family, which includes other viruses such as the rabies virus. Transmission is usually via direct inoculation with infected saliva, commonly through a bite from a bat, or contact of infected saliva with mucous membranes. ABLV affects neural tissues, entering peripheral nerves at the site of exposure and travelling in a retrograde manner to the CNS.

Clinical features of ABLV infection resemble that of encephalitic rabies including a agitation, hydrophobia, aerophobia and autonomic instability. Severe complications include asphyxiation, respiratory arrest and cardiac arrhythmias. Incubation period depends on host immune status and site of infection, with more rapid progression with exposure at sites of high innervation or on the face, neck or back, but is usually between 3-8 weeks. Once clinical symptoms are present, there is rapid deterioration and death within several days. All patients in Australia presenting with exposure to bat saliva should be managed for ABLV infection until proven otherwise. Wound sites should be washed thoroughly to inactivate the virus locally. For immunocompromised patients and patients never immunised with the rabies vaccine, management includes a series of rabies vaccinations and Human Rabies Immunoglobulin injection to the site of

exposure. For previously immunised patients, only two rabies vaccines are required. We present the case of a two year old child who had an unwitnessed bite from a Corben's Long-eared Bat. The child was treated as a possible ABLV case. The bat was subsequently tested and no ABLV was detected, so management for ABLV was ceased.





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