The Association of
Coloproctology of
Great Britain & Ireland

JOINT LONDON WINTER MEETING

Tuesday 12th December 2023
1830 - 2300
Heist Bank (Paddington)
5N N Wharf Road W2 1LA

Agenda

1830	Pizza and drinks
1855	Welcome from Sponsor
1900	Introduction - *Emma Carrington*
1910	Update from the ACPGBI executive - *Jared Torkington*
1920	Engineering the microbiome for improved surgical outcomes - *James Kinross*
1950	Joint London 2023 ACPGBI Research Prize Presentations
2010	Snowbody knows (the JL Colorectal Christmas Quiz)
2040	Networking

Targeted Factor V replacement during major trauma haemorrhage

Presenter
Anthony Thaventhiran, Colorectal Trainee, PhD Student Centre for Trauma Sciences. ST6 Epsom and St Helier NHS Trust

Region
South West London

Co-Authors
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Abstract
Background:
Factor Va (FVa), critical to thrombin generation in a massive haemorrhage protocol (MHP) can only be supplemented as Fresh Frozen Plasma. It is unknown whether FFP can sufficiently maintain FV during MHP and ongoing bleeding in trauma haemorrhage.

Aims:
1. Characterise the temporal changes of FV in trauma patients
2. Determine the efficacy of Factor Va replacement in a murine model of Acute Traumatic Coagulopathy (ATC).

Methods:
Trauma patients at a trauma centre were included with blood samples collected on admission and after transfusion of 4, 8 and 12 RBC units for FV assay.

In a preclinical model of ATC three groups were infused with vehicle, rhFVa (resistant to aPC), or hFVa 30 minutes after haemorrhage. Animals were euthanased and terminal blood was analysis for biomarkers of coagulation, fibrinolysis and FVa degradation.

Results:
207 trauma patients were included. Admission FV was 41% lower in MHP patients compared to those without major injury and RBC transfusion <4 units (60u/dL vs 102u/dL, p<0.0001). Despite MHP, FV levels decreased to 36u/dL (8U RBC) and 32u/dL (12U RBC).

Compared to vehicle, mice infused with rhFVa or hFVa had significantly higher median survival rates at 60 minutes (44% vs 80% vs 88%). There was at least a three-fold increase in plasmin-antiplasmin levels in the vehicle group compared to rhFVa/hFVa (208ng/ml vs 70ng/ml vs 31ng/ml, p<0.0001).

Conclusion:
FV in bleeding trauma patients is low on admission and not corrected by current MHP therapy. FVa replacement may represent a novel therapy for trauma haemorrhage.

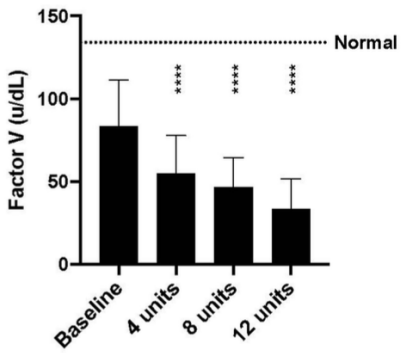

Figure1 Effect of Factor V concentration in bleeding critically injured trauma patients

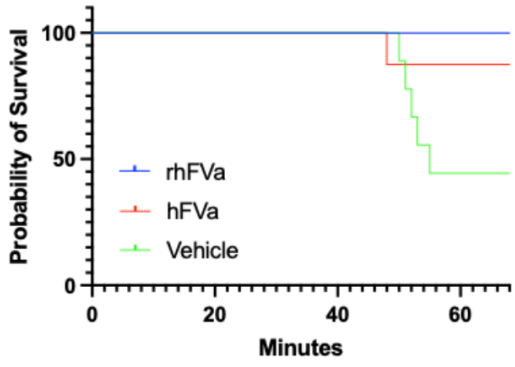

Figure 2 Effect of resuscitation of traumatically injured mice with vehicle, standard FVa (hFVa) or recombinant FVa resistant to activated Protein C (rhFVa).

Sarcopenia is independently associated with poor preoperative physical fitness in patients undergoing colorectal cancer surgery

Presenter
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Co-Authors
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Abstract

Background

Accurate preoperative risk assessment for major colorectal cancer (CRC) surgery remains challenging. Body composition (BC) and cardiopulmonary exercise testing (CPET) can be used to evaluate risk. The relationship between BC and CPET in patients undergoing curative CRC surgery is unclear.

Methods

Consecutive patients undergoing CPET prior to CRC surgery between 2010 and 2020 were identified between two different UK hospitals. Body composition phenotypes such as sarcopenia, myosteatosis and visceral obesity were defined using widely accepted thresholds using preoperative single axial slice CT image at L3 vertebrae.

Results

218 patients with stage I-III CRC were included. On univariate linear regression analysis male sex ($p<0.001$) was positively associated with VO2 at AT. While ASA grade ($p<0.001$) and BMI ($p=0.007$) were negatively associated with VO2 at AT, on multivariate linear regression analysis these variables remained significant ($p<0.05$).

On univariate linear regression analysis male sex ($p<0.001$) was positively associated with VO2 peak. While age ($p<0.001$), ASA grade ($p<0.001$), BMI ($p=0.003$), sarcopenia ($p=0.015$) and myosteatosis ($p<0.001$) were negatively associated with VO2 peak. On multivariate linear regression analysis age ($p<0.001$), ASA grade ($p<0.001$), BMI ($p<0.001$) and sarcopenia ($p=0.006$) were independently and negatively associated with VO2 peak.

Conclusions

The novel finding that sarcopenia is independently associated with reduced VO2 peak performance in CPET supports the supposition that reduced muscle mass relates to poor physical function in CRC patients. Further work should be undertaken to assess whether sarcopenia diagnosed on CT can act as suitable surrogate for CPET to further enhance personalised risk stratification.

Performance of large language models at the MRCS Part A: a tool for medical education?

Presenter
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Region
South East London

Co-Authors
Kyle Lam, Imperial College London

Abstract
Introduction
The Intercollegiate Membership of the Royal College of Surgeons examination (MRCS) Part A assesses generic surgical sciences and applied knowledge using 300 multiple-choice Single Best Answer items. Large Language Models (LLMs) are trained on vast amounts of text to generate natural language outputs, and applications in healthcare and medical education are rising.

Methods
Two LLMs, ChatGPT (OpenAI) and Bard (Google AI), were tested using 300 questions from a popular MRCS Part A question bank without/with need for justification (NJ/J). LLM outputs were scored according to accuracy, concordance and insight.

Results
ChatGPT achieved 85.7%/84.3% accuracy for NJ/J encodings. Bard achieved 64%/64.3% accuracy for NJ/J encodings. ChatGPT and Bard displayed high levels of concordance for NJ (95.3%; 81.7%) and J (93.7%; 79.7%) encodings, respectively. ChatGPT and Bard provided an insightful statement in >98% and >86% outputs, respectively.

Discussion
This study demonstrates that ChatGPT achieves passing level accuracy at MRCS Part A and both LLMs achieve high concordance and provide insightful responses to test questions. Instances of clinically inappropriate or inaccurate decision-making, incomplete appreciation of nuanced clinical scenarios and utilisation of out-of-date guidance was, however, noted. LLMs are accessible and time-efficient tools, access vast clinical knowledge, and may reduce the emphasis on factual recall in medical education and assessment.

Conclusion
ChatGPT achieves passing level accuracy for MRCS Part A with concordant and insightful outputs. Future applications of LLMs in healthcare must be cautious of hallucinations and incorrect reasoning but have the potential to develop AI-supported clinicians.

A feasibility study of preoperative 3D volumetric pelvic measurement using automated deep-learning CT segmentation to better define the empty pelvis after pelvic exenteration surgery

Presenter
Ioanna Drami, Colorectal Trainee, Homerton Hospital

Region
North East London

Co-Authors
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Abstract
Background
"Empty pelvis syndrome" following pelvic exenteration has a complex pathophysiology and lacks clear definition and objective measurement. The aim of this feasibility study was to introduce a new 3D pelvimetry volumetric technique from pre-operative CT scans in order to better define the "empty pelvis syndrome".

Methods
28 patients who underwent Total Pelvic Exenteration [TPE] without major bony resection were identified from a prospectively maintained database (2016-2021), at a tertiary referral complex cancer referral centre. Preoperative CT scans were used in order to measure the pelvic volume using Data Analysis Facilitation Suite (DAFS) v3.6 by Voronoi. DAFS is a deep learning-driven software capable of automated CT scan 3D segmentation.
The pelvic inlet border was defined by a straight line from the superior aspect of the pubic symphysis to the top of the sacral promontory in the sagittal plane. The pelvic outlet was defined for the purpose of the study as the cranial aspect of the pelvic floor muscles. This technique measures organ volumes, including pelvic visceral fat and pelvic side walls and subtracted according to the components of the planned pelvic exenteration.

Results
22 males; 6 females; median age of 59 years (range 31-74) with rectal cancer, 57% (16) complex primary cancers [PRCbTME]; 12 locally recurrent rectal cancers [LRRC]. Patients underwent TPE without major bony resection of the pelvis. The median male pelvic volume was 920cm3 (IQR 140), while the median female pelvic volume was 940cm3 (IQR 325).

Conclusions
Automated 3D volumetric pelvic assessment represents a novel approach to preoperative pelvic measurement that may more objectively quantify pelvic volume before surgery, facilitating planning of technical options to meaningfully replace lost volume. Further studies should relate volume assessments to postoperative outcomes