Med22

RCP annual conference

Research and innovation abstracts

Royal College of Physicians

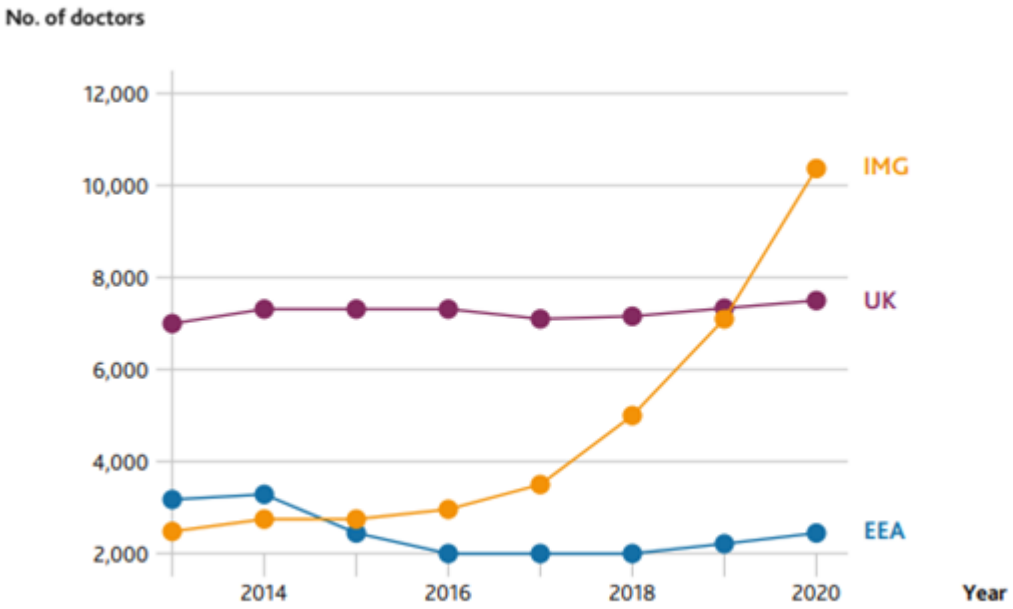
Developing an enhanced induction process for international medical graduates in the NHS

Authors: Ibreez Ajaz[A] and Mohammad Ibrahim Ivan[A]

[A]University Hospitals Plymouth NHS Trust, Plymouth, UK

The NHS has struggled with adequate staffing and retainment of doctors despite meeting local graduate quotas every year.[1] This has led to an increased intake of international medical graduates (IMGs), both from within the European Union (EU) and outside of it (Fig 1).[2] What hasn't, however, kept up with this influx is a structured framework for ensuring the integration of doctors who are not familiar with the UK healthcare system.[3]

Fig 1. Doctors taking up (or returning to) a licence to practise, by PMQ (excluding TRE and UK 2020 graduates), from 2012 to 2020.[2]



In fact, many international doctors are at a significant disadvantage when they first start their careers as they have very little knowledge surrounding the NHS organisational structure, local clinical and procedural skills, and colloquialisms (to name a few).[3–6] Despite these figures, resources and support for international medical graduates (IMGs) are few and far between.[3,5–8]

It is thus prudent that the creation of a clear and balanced foundation for these new doctors be instituted across the NHS to enable a smooth integration.

We conducted a retrospective survey among the international doctors working at Derriford Hospital, Plymouth. These were doctors of all grades, with experience ranging from internship to many years of postgraduate work, currently in trust grade, training, SAS or consultant roles at Derriford. The survey explored the association of having supernumerary roles/shadowing periods, previous UK clinical attachments, and general knowledge of the NHS as well as if they were offered any support or induction

(be it corporate or departmental) before undertaking their posts to delineate if the doctor felt prepared from day one.

69% of the respondents rated their first NHS induction as 3 or lower out of 5. 44% of the doctors didn't receive a separate departmental induction when they started. 92% believed that they would have benefited from a separate IMG-specific induction.

There is ample data outlining the dire need for doctors to sustain the NHS,[9] with projections that there will be a 47% increase in demand for doctors by 2030.[1] This, compounded with the need for more medical students (RCP policy from 2018[1] calculated a need of 2,840 medical students every year for the next 5 years to meet future consultant demands), means that the NHS will need to rely on external graduates to ensure patient safety as well as to maintain a balanced workforce.

As we know, the NHS itself is a complex hierarchical structure with many layers.[10] Given this, a 'one size fits all' approach for providing this induction would be inappropriate.

Thus, we are proposing a standardised framework for an 'enhanced IMG induction' process which would allow individual trusts/organisations within the NHS to 'fill in their own blanks'. This should be separate from the main induction or even the departmental inductions that many trusts administer on a yearly basis given the unique topics that would need to be covered. It would also allow for the 'out-of-sync' starting doctors to be included.

Reference

1. Royal College of Physicians. *Double or quits: calculating how many more medical students we need.* RCP, 2018. Available from https://www.rcplondon.ac.uk/news/double-or-quits-calculating-how-many-more-medical-students-we-need [Accessed 7 February 2021].
2. General Medical Council. *The changing medical workforce.* www.gmc-uk.org/-/media/documents/somep-2020-chapter-3_pdf-84686032.pdf [Accessed 7 February 2022].
3. Jalal M, Bardhan KD, Sanders D, Illing J. Overseas doctors of the NHS: migration, transition, challenges and towards resolution. *Future Healthc J* 2019;6:76–81.
4. Morrow G, Rothwell C, Burford B, Illing J. Cultural dimensions in the transition of overseas medical graduates to the UK workplace. *Medical Teacher* 2013;35:e1537–45.
5. Michalski K, Farhan N, Motschall E, Vach W, Boeker M. Dealing with foreign cultural paradigms: A systematic review on intercultural challenges of international medical graduates. *PLOS ONE* 2017;12:e0181330.
6. Hashim A. Educational challenges faced by international medical graduates in the UK. *Adv Med Educ Pract* 2017;8441–5.
7. Woolf K. Differential attainment in medical education and training. *BMJ* 2020;368:m339.
8. Community Research. *Understanding the nature and scale of the issues associated with doctors' induction (including those returning to practice.* GMC, 2022. www.gmc-uk.org/-/media/documents/research-into-doctors-induction_docx-83264029.docx [Accessed 7 February 2022].
9. British Medical Association. *NHS short of 50,000 doctors heading into winter, BMA research finds.* BMA, 2021. www.bma.org.uk/bma-media-centre/nhs-short-of-50-000-doctors-heading-into-winter-bma-research-finds [Accessed 7 February 2022].
10. NHS England. *An introduction to the NHS.* www.england.nhs.uk/get-involved/nhs/ [Accessed 7 February 2022].

Day case thoracoscopy – a retrospective analysis

Authors: Avinash Aujayeb[A] and Karl Jackson[A]

[A]Northumbria Healthcare NHS Foundation Trust, UK

Background

Day case local anaesthetic thoracoscopy (LAT) with indwelling pleural catheter (IPC) insertion is currently being advocated to minimise length of stay in the COVID-19 pandemic. As part of this innovation, continuous service reviews are warranted. All local procedures are performed in theatre. Rapid pleurodesis with talc is not performed due to staffing problems. All patients receive erector spinae catheters to control post-operative pain.

Methods

All patients undergoing day case LAT between December 2019 and January 2022 were analysed. Basic demographics and outcomes were collected for a descriptive analysis of data.

Results

32 patients underwent day case LAT. All had negative pre-operative Covid-19 swabs; mean age was 72.4 years (range 34–83); 22 were male and 10 female. Diagnoses were nine lung cancers, 11 mesotheliomas and nine cases of fibrinous pleuritis (one of which went for video-assisted thoracoscopic surgery and proved to be mesothelioma). The lung did not deflate, not enabling biopsies in three (non-malignant diagnoses). 28 IPCs and two large bore drains were inserted due to surgical emphysema. One patient developed an empyema and one had cellulitis within 30 days. 28 IPCs have already been removed due to pleurodesis (median 54 range 21–197). All were discharged the same day except the two requiring large bore drains. Mean length of stay was 0 days. Diagnostic sensitivity of LAT is 96.5%. Pain scores at days 0, 1 and 2 after surgery were consistently low. No patient caught COVID-19 in the 30 days post surgery.

Conclusions

Day case LAT is feasible with our current set up and should be widely adopted. The health economics of preventing admission are considerable.

Palliative care virtual ward: early evaluation of a novel model of care to support patients with complex symptom management known to a UK tertiary hospital specialist palliative care team

Authors: Caroline Barry,[A] Louisa Grant[A] and May Wung[A]

[A]Norfolk and Norwich University Hospital NHS Foundation Trust, Norwich, UK

Introduction

This study aims to evaluate the pilot phase of a palliative care virtual ward (VW), believed to the first of its kind in the UK, to assess for safety, suitability, effectiveness and ability to reduce length of hospitalisation for patients managed by a specialist palliative care (SPC) team in a tertiary hospital setting.

Materials and methods

A retrospective single-centre evaluation of the first 10 patients transferred to a newly established 'palliative care VW', supported and delivered within the context of a wider hospital VW programme, established February 2021. Patients received daily contract via video consultation with a palliative care consultant. Remote physiological monitoring and nursing support was in place 24 hours a day. Patient outcome scores, readmission data, length of stay and referral reason were collected, alongside descriptive data of patient experience.

Results and discussion

All patients had metastatic cancer, were known to the SPC team during their hospital admission and met the complexity criteria for admission to an inpatient specialist palliative care unit. The average age was 65 years old. The average inpatient length of stay prior to VW was 9.8 days. The average length of stay in VW was 3.2 days. The average symptom score on Integrated Patient Care Outcome Scale (IPOS) on admission to VW was 24.4. On Day 1, the average score was 13.9, and on Day 3, 12.1. On average, symptom burden reduced by 51%. Reasons for admission to VW included rapid titration of pain management (seven), management of breathlessness and hypoxia post pulmonary embolus (one), management of pain related to sepsis (one) and management of bowel obstruction (one). There were no adverse events, no patients were readmitted to hospital and patient feedback was universally positive.

Conclusion

For patients in the last weeks and months of life, prolonged hospital admissions are rarely wanted. Restrictions in visiting arrangements and risk of COVID-19 infection are particularly pertinent to patients with terminal illness with complex symptom control issues; however, the premium on hospice beds often leads to lengthy hospital stays. The SPC VW model provides a promising, safe and effective alternative for such patients to be cared for in their own home during stabilisation of acute symptom control issues. Further work is need to understand the cost–benefit of this approach, which has the potential to increase specialist palliative care bed capacity in a innovative and effective way.

The association between admission hyperglycaemia and the no-reflow phenomenon in STEMI patients undergoing primary percutaneous coronary intervention

Authors: Amr Elkammash,[A] Mohamed Sobhy,[B] Amr Zaki[B] and Sherif Ayad[B]

[A]Cambridge University Hospitals, Cambridge, UK; [B]Alexandria University, Alexandria, Egypt

Introduction

No-reflow phenomenon is not uncommon in acute myocardial infarction patients treated by primary PCI (PPCI). It is associated with poorer left ventricular systolic dysfunction and higher mortality in such patients.[1] Diabetes was linked to increased incidence of no-reflow in PPCI.[2] We hypothesised that acute admission hyperglycemia, rather than diabetes, is responsible for this complication.

Materials and methods

We prospectively studied 120 consecutive STEMI patients presenting to two PPCI centres over a period of 6 months. We included all the patients eligible for PPCI according to the European Society of Cardiology (ESC) guidelines.[3] We excluded patients with previous PCI and stent thrombosis and patients with previous coronary artery bypass grafting (CABG). The local research ethics committee has approved the study protocol and we followed the Helsinki declaration of research ethics in human beings including informed consents. The patients were divided into two groups based on the coronary flow post-PPCI (normal flow and no-reflow). No reflow is defined as the absence of coronary TIMI 3 flow post PCI without mechanical obstruction.[1] A professional statistician did the analysis using IBM SPSS 21.0 software.

Results and discussion

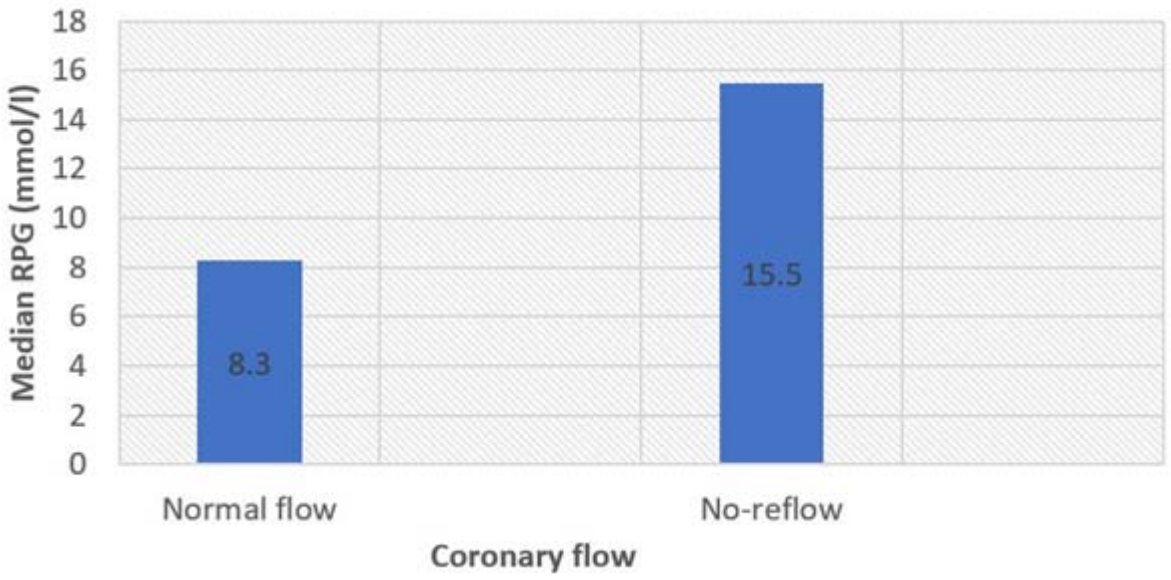
The incidence of no-reflow was 17.5% (n=21). There was no significant difference between the two groups regarding the clinical characteristics and the different cardiovascular risk factors including diabetes (Table 1). The median of admission random plasma glucose (RPG) level was significantly higher in the no-reflow group (15.5 vs 8.3 mmol/l, p=0.001) (Fig 1). A possible explanation is that hyperglycemia increases leucocytes' adhesion molecules, causing microvascular obstruction and Elastase-induced endothelial damage.[4] This augments thrombus formation and impairs ischaemic preconditioning.[5] The study was limited by the small study population size and the narrow geographical area of recruitment.

Table 1. The clinical characteristics of the studied groups.

Parameter	Normal flow group	No-reflow group	P value
Number of patients	99	21	
Mean age (years); standard deviation	56.3; 10.3	62.3; 7.9	0.014
Male sex	75 (75.8%)	13 (61.9%)	0.19
Non-diabetics	62 (62.6%)	9 (42.9%)	0.094
Diabetics of insulin	9 (9.1%)	2 (9.5%)	1.00
Diabetics of oral diabetic medications	28 (28.3%)	10 (47.6%)	0.084
Hypertension	48 (48.5%)	7 (33.3%)	0.206
Smoker	52 (52.5%)	9 (42.9%)	0.421
Ex-smoker	4 (4%)	1 (4.8%)	1.00
Dyslipidaemia	54 (54.5%)	15 (71.4%)	0.155
Family history of ischaemic heart disease	17 (17.2%)	2 (9.5%)	0.521
Previous acute coronary symdrome	19 (19.2%)	3 (14.3%)	0.762

Absence of pre-infarction angina	56 (56.6%)	15 (71.4%)	0.208

Fig 1. The admission random plasma glucose level in the studied groups.



Conclusion

Admission hyperglycemia, rather than diabetes, is associated with a higher incidence of no-reflow post-PPCI. The control of admission hyperglycaemia can help to reduce the peri-procedural complications of PPCI.

References

1. Niccoli G, Burzotta F, Galiuto L *et al*. Myocardial no-reflow in humans. *J Am Coll Cardiol* 2009;54:281–92.
2. Pantea-Roșan LR, Ţica OA, Moisi M *et al*. Predictors of no-reflow phenomenon: diabetes mellitus type II and obesity and their associated mortality in stemi patients after primary PCI. *Intern Med* 2019;16:7–12.
3. Ibanez B, James S, Agewall S *et al*. 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. The Task Force for the management of acute myocardial infarction in patients presenting with ST-segment elevation of the European Society of Cardiology (ESC). *Eur Heart J* 2018;39:119–77.
4. Hokama JY, Ritter LS, Davis-Gorman G *et al*. Diabetes enhances leukocyte accumulation in the coronary microcirculation early in reperfusion following ischemia. *J Diabetes Complications* 2000;14:96–107.
5. Ito H, Iwakura K, Kawano S *et al*. Predictive factors for development of the no-reflow phenomenon in patients with reperfused anterior wall acute myocardial infarction. *J Am Coll Cardiol* 2001;38:472–7.

The impact of a high fructose diet on the development of metabolic syndrome in male and female rats

Authors: Aleeza Fatima,[A] Anna Tolekova[B] and Mohammed Channa[C]

[A]Shrewsbury and Telford NHS Hospital Trust, Shrewsbury, UK; [B]Trakia University School of Medicine, Stara Zagora, Bulgaria; [C]Musgrove Park Hospital, Taunton, UK

Aim

To promote the development of metabolic syndrome (MetS) by inducing a high-fructose diet in male and female rats[1] and identify any protective role of sex hormones (estrogen and progesterone) in female rats.

Method

The experiment was based according to institutional, national regulations and the European Directive of 22 September 2010 (2010/63/EU) concerning the protection of animals used for scientific and experimental purposes.

30 Wistar rats were used, weighing 190–220g, divided into four groups: female control (FC) with a standard diet (SD) and plain water (PW), female fructose (FF) with SD and fructose water (FW), male control (MC) with SD and PW, male fructose (MF) with SD and FW for 12 weeks *ad libitum*.

Results

The glucose concentration of the MF group (12.6±1.8 mmol/l) was significantly higher than MC (9.83±2.73) and FF (8.89±1.67) groups. The level of triglyceride was increased in rats with high-fructose diet as compared to SD rats FF (2.75±1.42), FC (0.86±0.28), MF (1.73±1.00), MC (0.81±0.20). The level of cholesterol however was highest in MC (1.33±0.12), in comparison to MF (1.24±0.22), FC (1.29± 0.24) and FF (1.30 ±0.24). The ratio between lipid parameters was calculated, Chol/HDL MF (2.92±0 .39), FF (2.21±0.18), Non-HDL/HDL MF (2.18±0.41) FF (1.65±0.21). These ratios indicate that FF has lower values in comparison to MF, which may indicate the protective role of oestrogen.

Conclusion

A high-fructose diet may induce disturbances within blood parameters of glucose and lipid metabolism and leads to the development of metabolic syndrome.

Reference

1. Miller A, Adeli K, Dietary fructose and the metabolic syndrome. *Curr Opin Gastroenterol* 2008;24:204–9.

Undiagnosed malignancy presenting to same-day emergency care: a single unit experience

Authors: Oliver Madge[A] and Jordan Bowen[A]

Oxford University Hospitals NHS Foundation Trust, Oxford, UK

Introduction

Routes to diagnosis of malignancy include 2-week wait referrals from primary care, secondary care referrals and emergency presentations.[1] Understanding the phenotypical presentations of malignancy to same-day emergency care (SDEC) units informs resource allocation and pathway development. We hypothesised that malignancies with less specific symptoms would more commonly present as emergencies.

Methods

At a single SDEC unit in the UK, we identified patients admitted between April 2018 and July 2020 and newly diagnosed with a malignancy in the 30 days following admission. We extracted demographics and malignancy diagnosis from the electronic patient record system and examined the clerking documentation to determine presenting symptoms, and whether or not the referral was for a previously undiagnosed cancer. All presenting symptoms were recorded verbatim and classified by group (respiratory, cardiac, gastro-intestinal, constitutional, neurological etc.).

Results and discussion

18,952 patients attended during the study period. 199 had a new malignancy with 139 (70%) not already under investigation for cancer, representing 0.7% of total patients. The average rate of new malignancy was five per month. The results are summarised in Table 1.

Pancreatic, liver and oesophageal cancers were over-represented in patients diagnosed following admission to the SDEC unit. Many of these patients presented with non-specific constitutional or gastro-intestinal symptoms not easily identified by existing pathways such as two-week wait and, despite the development of complementary pathways such as SCAN,[3] it is likely that malignancy presentations to SDECs will increase with increasing throughput of patients.

The limitations of this study are that it was performed at a single unit with a relatively small sample size. Further studies are required to confirm the findings.

Ethics approval was not required for this service evaluation study.

Table 1. Newly diagnosed malignancies following presentation to a same day emergency care unit

Demographics	
Gender	Female 72 (52%), male 67 (48%)
Age (median [IQR])	72.8 [60.7-80.5] years
Primary site (UK rank)	
Lung (3)	21 (15%)
Pancreas (10)	14 (10%)
Colon (4)	12 (9%)
Non-Hodgkin lymphoma (6)	10 (7%)
Breast (1)	8 (6%)
Oesophagus (14)	8 (6%)

Liver (18)	7 (5%)
Prostate (2)	7 (5%)
Brain (9)	6 (4%)
Stomach (17)	5 (4%)
Presenting symptoms	
Constitutional	64 (46%)
Gastrointestinal	64 (46%)
Respiratory	42 (30%)
Musculoskeletal	14 (10%)
Neurological	14 (10%)
Renal	4 (3%)
Psychological	2 (1%)
Urological	1 (1%)
Cardiac	1 (1%)
Pain	54 (39%)
Laboratory	26 (19%)
Venous thromboembolism	1 (1%)
Bleeding (any site)	9 (7%)

Conclusion

Undiagnosed cancer is seen in 0.7% of patients presenting to the SDEC unit, at a rate of approximately one per week. Pancreatic, liver and oesophageal cancers were over-represented relative to their general incidence in the population.

When designing and resourcing SDEC units, it is important to take the presentation of undiagnosed malignancy into consideration with appropriate systems and adequate resources to ensure timely work-up and follow-up of these patients.

References

1. National Cancer Registration and Analysis Service. *Routes to diagnosis.* www.ncin.org.uk/publications/routes_to_diagnosis [Accessed 17 Jan 2022].

2. Office for National Statistics. *Cancer registration statistics, England Statistical bulletins.* www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/cancerregistrationstatisticsengland/previousReleases [Accessed 30 Jan 2022].

3. Nicholson BD, Oke J, Smith CF *et al*. The Suspected CANcer (SCAN) pathway: protocol for evaluating a new standard of care for patients with non-specific symptoms of cancer. *BMJ Open* 8:e018168.

Failure to mount a humoral response to COVID-19 vaccination identifies individuals with previously undiagnosed severe antibody deficiency state: preliminary data from the COVID-19 ENLIST study

Authors: Mark Ponsford[A]

[A]Cardiff University, Cardiff, UK

Introduction

Immunisation with mRNA or adenovirus-based COVID-19 vaccinations provides a potent immunogenic stimulus. In the vast majority of individuals, vaccination elicits cellular and humoral (antibody) immune responses to the spike protein mediating protection against severe disease against SARS-CoV-2 infection, including novel variants.[1] However, susceptibility to severe disease and failure to respond to COVID-19 vaccinations remain a particular concern in immunocompromised patient groups.[2] In a recent survey of vaccine responses in individuals with inherited and acquired forms of immunodeficiency, the magnitude of the humoral IgG vaccine response to COVID-19 vaccines appeared related to the magnitude and nature of the underlying immunodeficiency.[2] Here, I explore the novel concept that failure to elicit a humoral vaccine response can identify individuals with previously undiagnosed humoral immunodeficiency, in a pilot study of solid-organ transplant recipients (SOTRs).[3]

Material and methods

Serum was obtained from participants enrolled in the COVID-19 ENLIST vaccination sub-study (REC reference: 20/YH/0309). Samples were obtained following informed consent and at least 14-days following receipt of two doses of COVID-19 vaccination, as recently described.[3] Anti-SARS-CoV-2 spike S1 IgG serological responses were determined using a commercial assay (EUROIMMUN) as per kit instructions. Total IgG, IgA, and IgM levels were analysed using the Optilite® turbidimeter in consecutive stored sera with anti-SARS-CoV-2 spike IgG levels above ('responders', n=15) and below ('non-responders', n=18) the assay's limit of detection for a positive anti-spike IgG response. Comparisons are presented by vaccine response group and relative to the UK laboratory adult reference range (approximately normally distributed). Data were curated in Microsoft Excel with statistical analysis in GraphPad Prism v6.0. Severe hypogammaglobulinaemia was defined as a serum IgG < 4 g/L, based on meta-analysis demonstrating a doubling in the risk of infections below this level.[4]

Results and discussion

The percentage of SOTRs with serum immunoglobulin class below the lower limit of normal is shown in Table 1. Individuals failing to mount a detectable anti-spike IgG response following COVID-19 vaccination display a substantially increased frequency of low IgG and low IgM levels, compared to the UK reference population (Fisher's exact test: p=0.0093 and p<0.0001, respectively). While there was no statistically significant difference in the odds of a low IgG (<6 g/L) between the SOTR vaccine responder/non-responder groups (Fisher's exact test: p=0.340), the lowest IgG in the vaccine non-responder group was 3.1 g/L is clinically relevant.

Table 1. Percentage of solid organ transplant recipients with serum immunoglobulin class below the lower limit of normal

	UK reference range	Vaccine responders (n=15)	Vaccine non-responders (n=18)
IgG <6 g/L	5.0%	6.8%	22.2%
IgA <0.8 g/L	5.0%	0.0%	11.1%

IgM 0.5 g/L	5.0%	40.0%	44.4%

Conclusion

Antibody deficiency is a treatable cause of infection susceptibility;[5] however, recognition is reliant on laboratory diagnosis. Solid organ transplant recipients are at increased risk of hypogammaglobulinaemia due to factors including the use of anti-rejection immunosuppressive medications, but severe deficiency remains rare.[6] This preliminary data support the hypothesis that failure to produce a detectable anti-SARS-CoV-2 spike IgG response following at least two COVID-19 vaccine doses is associated with a reduction in the serum levels of IgG. Remarkably, this pilot study identified an individual with an IgG level of 3.1 g/L, consistent with severe IgG deficiency and directs clinical assessment with potential consideration of immunoglobulin replacement therapy.

Funding statement

Welsh Clinical Academic Training (WCAT) Fellowship; Kidney Wales; Association of Clinical Pathologists

References

1. Gao Y, Cai C, Grifoni A, Müller TR *et al*. Ancestral SARS-CoV-2-specific T cells cross-recognize the Omicron variant. *Nature Med* 2022, in press (DOI: 10.1038/s41591-022-01700-x).
2. Ponsford MJ, Evans, K, Carne E, Jolles S. COVID-19 vaccine uptake and efficacy in a national immunodeficiency cohort. *J Clin Immunol* 2022, in press (DOI: 10.1007/s10875-022-01223-7).
3. Asderakis, A, Khalid U, Koimtzis G *et al*. An analysis of serological response and infection outcomes following Oxford Astra Zeneca (AZD1222) and Pfizer-BioNTech (mRNA BNT162b2) SARS-CoV-2 vaccines in kidney and kidney-pancreas transplants. *Transplantation* 2022, in press (DOI: 10.1097/TP.0000000000004105).
4. Florescu DF, Kalil AC, Qiu F, Schmidt CM, Sandkovsky U. What is the impact of hypogammaglobulinemia on the rate of infections and survival in solid organ transplantation? A meta-analysis. *Am J Transplant* 2013;13:2601–10.
5. Ponsford M, Carne E, Kingdon C *et al*. Facilitated subcutaneous immunoglobulin (fSCIg) therapy – practical considerations. *Clin Exp Immunol* 2015;182:302–13.
6. Sarmiento E, Jimenez M, di Natale M, Rodriguez-Ferrero M, Anaya F, Lopez-Hoyos M *et al*. Secondary antibody deficiency is associated with development of infection in kidney transplantation: Results of a multicenter study. *Transpl Infect Dis* 2021;23:e13494.