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21st Annual Meeting of the UK and Ireland Neuroendocrine Tumour Society 2023

Oral Communications

OC1

Novel phenotypic and exonic variants for Neuroendocrine Neoplams: a UK Biobank study

Dr. Harry Green[1], Dr. Brian Rous[2], Dr. Gareth Hawkes[1], Maria Trinidad Moreno-Montilla[3], Chinonso Nwoguh[4], Prof John Ramage[5] & Prof Chrissie Thirlwell[6]
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Neuroendocrine neoplasms (NENs) are a heterogeneous tumour classification including indolent neuroendocrine tumours (NETs), aggressive neuroendocrine carcinomas (NECs). NECs and small cell lung cancer (SCLCs) are poorly differentiated tumours and life expectancy following metastatic diagnosis is less than 1 year. Currently, there are known variants in germline DNA that associate with bronchial and pancreatic NENs, but not intestinal. We conducted an exome-wide association study in the UK Biobank ($n=500{,}000$) to test for phenotypic and rare coding variations in germline DNA that associate with NETs, NECs and SCLC. We used histology and ICD10 data from the UK Biobank's cancer registry linkage to define phenotypes for NET ($n=591$), NEC ($n=328$), and SCLC ($n=477$) and a cohort of cancer-free controls ($n=395{,}914$). We used regenie to perform single-variant and rare ($<0.1\%$) variant gene-based tests for cancer-causing germline variants for each of the three NEN phenotypes. We found significant phenotypic associations between baseline BMI and HbA1c with all three NEN phenotypes. SCLC further associated with environmental pollution (OR = 1.31 (1.21-1.41) $P=2.9e-12$) and Townsend deprivation index (OR = 1.61 (1.49-1.74) $P=4.2e-33$). In the single-gene tests, a single variant in the DST gene (6:56482593) associated with SCLC (Beta = 6.0 (4.4-7.6), $P=4.9e-8$). In the gene-based tests, loss-of-function variants in MEN1 (Beta = 6.9 (4.9-8.9), $P=2.2e-7$) associated with NECs. Germline mutations in MEN1 are known to associate with NETs, but this is the first study to show an association with NECs. We also identified a novel variant for SCLC in the DST gene. Further investigation could help understand how NECs and SCLCs develop and progress.

DOI: 10.1530/endoabs.96.OC1

OC2

Interim analysis of Lantana: A phase Ib study to investigate epigenetic modification of somatostatin receptor-2 with ASTX727 to improve therapeutic outcome with [177Lu]Lu-DOTA-TATE in patients with metastatic neuroendocrine tumours (NCT05178693)

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Background
Peptide-receptor-radionuclide-therapy (PRRT) improves progression free survival in metastatic neuroendocrine neoplasia (NEN). To be suitable for PRRT, somatostatin receptor-2 (SSTR2) must be present on tumour site as determined by positive uptake on [68Ga]Ga-DOTA-peptide-PET/CT. LANTana is an ongoing study evaluating whether treatment with the demethylating agent, ASTX727, results in re-expression of SSTR2, as determined by [68Ga]Ga-DOTA-peptide-PET/CT, allowing subsequent PRRT.
Methods
Key eligibility criteria: histological diagnosis of NEN (Ki67 < 55%). No/low uptake on baseline [68Ga]Ga-DOTA-TATE-PET/CT
Design
Following baseline [68Ga]Ga-DOTA-peptide-PET/CT, patients receive 5 days of ASTX727 (fixed dose 35mg decitabine + 100mg cedazuridine). [68Ga]Ga-DOTA-peptide-PET/CT is repeated on day 8 + 2. If there is significant uptake as defined as greater-than-liver-in-most-lesions, patients will receive up to further 4 cycles of ASTX727 on days 1-5 followed by PRRT on day 8 + 2.
Results
As of 06/09/2023 10 patients were enrolled. Most common primary site was lung ($n=5$), and median Ki67 was 20% (range 1%-39%). Patients had received a median of two prior systemic treatments (range 1-4). 2 patients withdrew consent prior to repeat [68Ga]Ga-DOTA-peptide-PET/CT. Four patients had re-expression of SSTR2 as illustrated by increase expression on [68Ga]Ga-DOTA-peptide-PET/CT following ASTX727, two of whom proceeded to PRRT. Following administration of ASTX727, 28 grade 1 or 2 adverse events (AEs) occurred in four patients, the commonest being nausea. One episode of grade 3 neutropenic sepsis was recorded. No patient discontinued ASTX727 due to AEs.
Conclusion
Use of a demethylating agent to re-express SSTR2 is feasible allowing PRRT in patients who otherwise would not be eligible. The safety profile was manageable, with no unexpected toxicities. The study is ongoing.

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OC3

Factors affecting overall survival after surgery for lung neuroendocrine tumours: A single centre series

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Introduction
Surgery is the only known curative therapy for lung/bronchial neuroendocrine tumours (NET). Factors that affect survival after surgery for lung NET are not clear, and hence follow up protocols are not evidence-based.
Methods
We collected data on 318 prospective patients that were operated on at a single centre between 2012 and 2020 (Guys and St Thomas's regional thoracic surgery unit). The aim was to generate the overall survival of the cohort, and factors affecting survival. Factors that were entered into the survival analyses included sex, age, operation type, location of tumour (right vs. left lung), type of carcinoid (typical vs. atypical), presence of tumour necrosis, mitotic index, size of tumour, margin, and the TNM stage. Overall survival was calculated from NHS Spine and date of last follow up was 1st August 2023. Statistical analysis was performed using RStudio. Kaplan Meier curves for survival and for different subgroups were generated. Log rank tests for subgroups were performed. Univariate and multivariate analyses were performed using Cox regression.
Results
Females were 70% of the cohort. Median age was 63 years [18-89]. Tumours were 80% typical and 17% atypical carcinoids. 75% of patients had T1 stage. Operations included 263 lobectomies, 6 pneumonectomies and 32 wedge resections. Thirty-day survival was 99.4% [99-100%]. 1-year, 3-year and 5-year survival were 99%, 97% and 94% respectively. Factors that were significant on the univariate analysis were age, presence of necrosis, mitotic index, tumour size, and wedge resection. Factors that were significant on the multivariate analysis were age, mitotic index. Both analyses are summarized in the attached table.
Conclusion
This is one of the largest single centre series with complete follow up in terms of survival. Five-year survival at 94% indicates surgery is the rational initial therapy even in node positive cases, but caution is needed in those with higher mitotic index. Good patient selection and high volume regional centres can result in good outlook for these relatively rare tumours.

Characteristic	HR(Univariate)	HR(Multivariate)
Age	1.08*	1.06*
Presence of necrosis	3.46*	0.71
Mitotic index	1.34*	1.50*
Size	0.96*	0.94*

*$P < 0.05$

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Poster Presentations

P1

Development of a mobile app for patients with neuroendocrine neoplasm

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Digital technology has an important role in the monitoring and management of long term conditions. The purpose of this study was to evaluate the feasibility of using PROMS to monitor symptoms, via a disease specific mobile application. Secondary endpoints included QoL and patient engagement. In addition, we reviewed the total number of symptoms reports and time required for patients to complete and submit these.
Methods
Unmet patient needs were identified through patient workshops. In addition, a steering group identified the clinical requirements, leading to the inclusion of demographics, clinical information, medications, therapies plus a symptom tracker and quality of life questionnaires in the product specification. The app includes links to educational and self-management resources provided by NPF, including NPF handbook, video and other online resources. The app was hosted on the App store (for both Android and Apple). The app was available for download by patients within the UK. Patients at six NETS Centres were invited to participate in a formal study to assess patient utilisation and demand. Clinical teams could contact patients and accumulate data for research used a CE-marked clinical portal.
Results
Over two years to June 2023, a total of 710 individuals registered to use the app, across at least 58 hospital sites. 54% were female and 46% male. Most users did not record DOB. Most common primary sites recorded are small bowel, pancreas and gastric. 320 individual users completed 672 PROMS (EORTC-C30 and/or GI-NET 21), on average each user completed 2.1 QOL questionnaires. 90% of users used the app between 1 and 10 times. 31,787 symptoms were recorded by 220 patients – an average of 145 symptom reports per patient. Use of the app remained steady throughout the period, with an average of 143 monthly logins but churn increased over time, perhaps resulting from the lack of a clinical feedback loop;
Conclusions
Patient engagement is good using a bespoke NET mobile app, but could be improved with greater clinical engagement and deeper integration into health records. There was excellent recording of symptoms and QOL data and high uptake of both within and outside the study cohort.

DOI: 10.1530/endoabs.96.P1

P2

The Global leadership into malnutrition criteria reveals a high percentage of malnutrition which influences overall survival in patients with gastroenteropancreatic neuroendocrine tumours using somatostatin analogues

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Introduction
Patients with neuroendocrine tumours located in the gastroenteropancreatic tract (GEP-NETs) and treatment with somatostatin analogues (SSA's) are at risk of malnutrition which has been reported previously, based on weight loss or body mass index (BMI) only. Since 2019 The Global leadership into malnutrition (GLIM) criteria exist to diagnose malnutrition, including weight loss, BMI and sarcopenia. These GLIM criteria have not been assessed in patients with GEP-NETs using SSA's. In non-NET cancers the presence of malnutrition, has a negative effect on overall survival. In patients with GEP-NETs using SSA's this has not been explored before.
The aim
To describe the presence of malnutrition in patients with GEP-NETs using SSA's based on the GLIM criteria and correlate this with overall survival.
Methods
Cross-sectional study with single screening patients with GEP-NETs using SSA's for malnutrition using the GLIM criteria. Body composition analysis for sarcopenia diagnosis were performed. Overall survival since the date of nutrition screening was calculated. Uni- and multivariate Cox regression analysis were performed to identify malnutrition as risk factor for overall survival.
Results
A total of 118 patients, 47% male, with median age 67 year (IQR 56.8 – 75.0) were included. Overall, malnutrition was present in 88 patients (75%); based on low BMI in 26 (22%), based on weight loss in 35 (30%), and based on sarcopenia in 83 (70%). The presence of malnutrition demonstrated a significantly worse overall survival (p-value 0.01). In multivariate analysis meeting 2 or 3 GLIM criteria was significantly associated with worse overall survival (HR 2.16 95% CI 1.34 – 3.48, p-value 0.002). Weight loss was the most important risk factor out of the 3 GLIM criteria (HR 3.5 95% CI 1.14 – 10.85, p-value 0.03) for worse overall survival.
Conclusion
A high percentage (75%) of patients with GEP-NETs using SSA's meet the GLIM criteria for malnutrition. Meeting more than 1 GLIM criterium, especially if there is weight loss these are risk factors for worse overall survival. Patients could benefit from regular weight monitoring and possibly from early nutritional intervention. Future research should focus on the effect of nutritional interventions and overall survival.

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P3

High prevalence of deficiencies in fat-soluble vitamins, minerals and trace elements but no relation with malnutrition in patients with gastroenteropancreatic neuroendocrine tumours using somatostatin analogue's

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Introduction
Since 2019 the Global Leadership Into Malnutrition (GLIM) criteria exist for diagnosing malnutrition. Patients with gastoenteropancreatic (GEP) neuroendocrine tumours (NETs) using somatostatin analogue's (SSA's) are at risk of malnutrition. Deficiencies in fat-soluble vitamins, minerals and trace elements are not part of the GLIM criteria but frequently reported in patients with GEP-NETs using SSA's. The relationship between malnutrition and these deficiencies has not been explored before.
The aim
To describe the prevalence of deficiencies in fat-soluble vitamins, minerals and trace elements and explore the relation these of deficiencies with malnutrition in patients with GEP-NETs using SSA's.
Methods
A cross-sectional study was performed screening single-time patients with GEP-NETs using SSA's for deficiencies in fat-soluble vitamins (A, D), minerals (Magnesium, Iron), trace elements (Zinc) and for malnutrition using GLIM criteria. This included screening for weight, weight loss, body mass index (BMI) and sarcopenia using body composition analysis. Logistic regression was performed to explore the relationship between deficiencies and the presence of malnutrition.
Results
A total of 118 patients, 55 males (47%) with a median age 67 (IQR 56.8 – 75) year were included. Primary tumours were located in the small intestine $n=91$ (77%) and pancreas $n=25$ (21%). The median period on somatostatin analogue was 23 months (IQR 5.5 – 59 months). The prevalence of deficiencies was 75% ($n=81$) for iron, 55% ($n=57$) for iron saturation, 54% ($n=64$) for vitamin D, 25% ($n=29$) for vitamin A, 51% ($n=54$) for zinc and 19% ($n=22$) for magnesium. Malnutrition was present in 88 patients (75%). There was no relationship between any of the deficiencies and the presence of malnutrition.
Conclusion
Patients with GEP-NETs using SSA's demonstrate a high prevalence of deficiencies in fat-soluble vitamins, minerals and trace elements and are frequently malnourished but a relationship between specific deficiencies and the presence of malnutrition could not be identified. Patients with GEP-NETs using SSA's should be screened annually for malnutrition (using GLIM criteria) and fat-soluble vitamins, minerals and trace elements. If deficiencies are found

supplementation is recommended. Future research should focus on early identification of deficiencies and the benefits of supplementation.

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P4

Is a patient's bmi representative of their body composition in neuroendocrine tumours?

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Background
Up to 60% of patients with neuroendocrine tumours (NETs) are malnourished. This negatively impacts survival, length of hospital stay, risk of complications, treatment response, fatigue and quality of life. Malnutrition is typically defined by body mass index (BMI) or weight loss, which provides no information on body composition. Research in other cancers has shown sarcopenia is more significant than BMI. Information is lacking on the influence of anthropometric parameters in NETs.
Aims
To determine whether weight and BMI are indicative of body composition in patients with NETs.
Methods
Data for 433 patients seen by a specialist NET dietitian over 2 years was provided by bioinformatics. Of these, 41 patients had a full set of anthropometric data including; weight, BMI, handgrip strength (HGS), mid arm circumference (MAC), mid arm muscle circumference (MAMC) and triceps skinfold thickness (TSF).
Results
Of the 41 patients included, mean BMI was categorised as healthy at 23.1 kg/m2 (range: 15.2-38.2 kg/m2), only 12% of patients were underweight (BMI $<$18.5 kg/m2). However, 93% of patients had a MAC $<$50th centile, 85% had a TSF $<$50th centile and 82% had a MAMC $<$50th centile when compared to normal for their age and gender. Mean HGS was 81% (24 kg) of normal for patients' age and gender, range was 51-144% (13.1-47.4kg). A correlation coefficient of 0.21 was found between BMI and HGS, 0.62 for BMI and MAMC and 0.31 between BMI and TSF.
Conclusion
Despite the majority of patients having healthy BMIs, upper body muscle mass, fat mass and grip strength were mostly below average and there is a poor correlation between different measurement methods. Standard nutritional assessment is likely inadequate. Further research is required.

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P5

Investigation of the utility of [^{68}Ga]Ga-DOTA-TATE PET/CT scanning in patients with Multiple Endocrine Neoplasia Type 1 (MEN1) with suspected pancreatic neuroendocrine tumours

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Purpose
To evaluate the added benefit and accuracy of [^{68}Ga]Ga-DOTA-TATE PET/CT scans in detecting pancreatic neuroendocrine tumours, compared to conventional cross-sectional imaging with CT or MRI scans, in patients with multiple endocrine neoplasia type 1 (MEN1)
Methods
A retrospective analysis was performed comparing the initial [^{68}Ga]Ga-DOTA-TATE PET/CT to the respective contemporary CT or MRI imaging in patients with MEN1 under the care of a tertiary endocrine centre. Imaging and electronic patient records were analysed to identify treatment plans and the records of multidisciplinary team discussions.
Results
In total, 85% (n=39/46) of patients with MEN1 had a [^{68}Ga]Ga-DOTA-TATE PET/CT study in the electronic patient record; 23 of these also had contemporaneous contrast enhanced CT scans, while 18 had MRI scans. [^{68}Ga]Ga-DOTA-TATE PET/CT detected a total of 47 pancreatic lesions compared to 25 on CT, while [^{68}Ga]Ga-DOTA-TATE PET/CT detected 36 lesions compared to 24 on MRI. In 18% of patients (n=7/39), pancreatic lesions were detected on [^{68}Ga]Ga-DOTA-TATE PET/CT which were not seen on MRI or CT, while 33% (n=13/39) had extra-pancreatic lesions detected on [^{68}Ga]Ga-DOTA-TATE PET/CT that were not seen on MRI or CT. As a result of findings on [^{68}Ga]Ga-DOTA-TATE PET/CT scanning, a change of management was indicated in 82% (n=32/39) of patients. Of these, 33% (n=13/39) were referred for further investigations, 23% (n=9/39) were started on somatostatin analogues, while 15% (n=6/39) were recommended surgery.
Conclusion
In patients with MEN1, [^{68}Ga]Ga-DOTA-TATE PET/CT was shown to detect a greater number of pancreatic and metastatic lesions compared to conventional cross-sectional CT or MRI imaging. Management plans were changed in most patients following their initial [^{68}Ga]Ga-DOTA-TATE PET/CT. Therefore, we suggest that such radionuclide scanning should be an integral part of the investigation of patients with MEN1.

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P6

Evaluation by patient questionnaire of a dedicated NET dietitian service provided to Neuroendocrine Tumour patients

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Introduction
The Wessex NET Group provides a dedicated NET dietitian service to patients across Dorset and Southern Hampshire. Patients receive individualised, evidence based advice by a dietitian with experience in the specific nutritional issues that NET patients experience. A patient questionnaire was implemented to assess the impact of the NET dietitian.
Method
212 confidential questionnaires were posted to all living patients who had had contact with the NET dietitian from September 2020 to August 2022. Patients were given six weeks to complete and return the questionnaire.
Results
104 questionnaires were returned, a response rate of 49%. Referrals to the dietitian were made by a NET nurse 49% or a consultant 31%, with the remainder being direct or self-referral. First consultations were two thirds phone and one third face to face, and 94% of the patients felt this was suitable. Over 90% of the patients felt that the NET dietitian was knowledgeable about their condition, put them at ease to talk freely and listened to their concerns and needs. 88% felt the dietitian's advice was tailored to them and their lifestyle. 69% of patients agreed or completely agreed that the NET dietitian improved their overall health, 23% were in between and 5% disagreed. The highest physical health improvements were in stool consistency 81%, stool colour 70% and stool frequency 69%. Quality of life was improved in 75% of patients and 65% of the patients felt increased confidence in leaving the house. Sections for qualitative comments were included and over 80% of patients completed a response about what the NET dietitian did particularly well. A few comments were made in response to how the NET dietitian service could be improved.
Conclusion
Overall, results showed the positive impact that a specialist NET dietitian can have on patients' physical and mental health and quality of life. The high quality and availability of the NET dietitian service was greatly appreciated by patients. The questionnaire provided some recommendations which can be implemented by the NET dietitian to further improve the role.

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P7

Findings of a retrospective data analysis on outcome of temozolomide singe agent and temozolomide/capecitabine in patients with gastro-enteropancreatic neuroendocrine neoplasms (gep-nen) in the european neuroendocrine tumour centre of excellence at the beatson west of scotland cancer centre, glasgow

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Approximately 230 new patients with GEP-NEN are referred annually to the centre. Prevalence of GEP-NEN is increasing due to the availability of 2nd, 3rd or 4th line treatments. Oral chemotherapy is being used with increasing frequency in this setting. The NEN Team wished to explore the outcomes of patients treated with temozolomide singe agent and temozolomide/capecitabine during the previous 5 years and compare the findings with current literature. 18 patients were included in the analysis and were Grade 1 - 3 NEN. 7 had pancreatic NEN [pNEN] (G1 x1, G2 x 2 G3 x 5), 5 had small bowel NEN (G1 x 1, G2 x 3, I x UK), 3 were gastric (G1 x 1, G2 x 1 G3 x 1) and 3 others (G3 gallbladder, G2 appendix, UK colon). Age range was 47 - 79, median 68. 11 patients were pre treated with somatostatin analogue, 3 with IV chemotherapy and 4 had temozolomide/capecitabine as first line therapy. The best response was in pancreatic NEN. Mean PFS was 239 days (range 28 - 1458). Toxicity was generally mild, i.e., G2 haematological or gastro-intestinal. 6 patients (33%) died after 1 cycle. 1 - brain haemorrhage, 1- stroke and 1 due to COVID. 3 died due to disease progression prior to receiving cycle 2. 1 of those also had G3 haematological toxicity. Median follow up was 235 days (range 25 - one patient remaining on follow up). The best response was in pancreatic NEN which is consistent with current literature. PFS with temozolomide/capecitabine combination is greater in both small bowel and pNEN which is similar to this cohort. It is acknowledged this is a very small sample. The team will continue to analyse the data with a longitudinal approach to gain more robust data particularly as numbers treated continue to rise. As small bowel NEN and pNET are heterogenic more valid data may be obtained by analysing these as separate entities.

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P8

Audit of glycaemic control and assessment in Pancreatic Neuroendocrine Tumours (pNETS) in Sheffield NET Centre ENETS Centre of Excellence

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Background
There may be a bidirectional association between glycaemia and pNETS. Pre-existing diabetes mellitus(DM) is a recognised risk factor for the development of pNETS. Prevalence of DM in pNETS has been reported as 12-26% depending on patient age and tumour location. DM due to pNETS is classified as type 3C pancreatogenic diabetes, Type 3D caused by hormone disorders or Type 3E induced by medications. Functional pNETS, medical therapies and pancreatic surgeries can also have an effect on glycaemic control. Regular HbA1c monitoring is required to identify and manage diabetes. The evidence base on DM and prognosis in pNET is not clear.
Aims
To review HbA1c monitoring in pNET patients at presentation and during follow-up.
Methods
Patients with pNET were identified using the Sheffield NET database. Data collected, included demographics, tumour grade and stage, treatment and HbA1c values. Data was analysed using excel and SPSS statistics. The audit was approved by the Clinical Effectiveness Unit project panel at STH, reference number:11559.
Results
68 patients diagnosed with pNET from 2015-2022 were identified. Mean age at diagnosis was 62 years, 62% were male. 85% of patients had a non-functioning tumour, 43% had a grade 1 tumour (Ki-67 index), 37% had metastatic spread, 31% with liver metastasis. 52% of patients had surgical resection of the tumour, 49% of patients were treated with a somatostatin analogue, 25% treated with Lutathera. 22% of people in the cohort had a pre-existing diagnosis of diabetes, 1 patient had type 1 diabetes, 14 patients had type 2 diabetes. 21% (14/68) people diagnosed with PNET developed diabetes during follow-up. 12% (8/68) of patients required insulin, 5 of these patients had a pre-existing diagnosis of type 2 diabetes. 47% of patients had a HbA1c measured at diagnosis, 41% of patients diagnosed had annual HbA1c monitoring.
Conclusions
21% of pNET patients developed diabetes. This is similar to other publications. Here, less then 50% of patients had a HbA1c measured at diagnosis or had annual HbA1c monitoring. We would recommend monitoring of HbA1c in functional and non-functional pNETs as the impact of Type 3 diabetes mellitus is metabolic, nutritional and prognostic.

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P9

Evaluating the impact and patient experience of a transition from urine to plasma 5-HIAA measurement

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Background
5-Hydroxyindoleacetic acid (5-HIAA) is the main metabolite of serotonin and is measured in all patients newly diagnosed with neuroendocrine tumours both to diagnose carcinoid syndrome and to monitor treatment response for those with an elevated baseline level. Each test requires patients to avoid certain foods and collect urine over a 24 hour period. It is not known to what extent patients adhere to these requirements or find them burdensome. There is now a validated serum 5-HIAA assay available and patients at the Royal Marsden Hospital will be switched to this test which allows an opportunity to assess patient experience of the two methods.
Aim
To determine adherence to dietary restriction prior to 5-HIAA testing, challenges with 24 hour urine testing and patient preference for method of testing.
Methods
A prospective questionnaire was administered to patients after they completed paired tests for urine and plasma 5-HIAA. Responses were entered into an Excel spreadsheet along with data for a cohort of patients who undertook paired samples, and descriptive analysis was performed.
Results
20 patients completed the questionnaire. 75% of patients were required to test every 3-10 months as part of their monitoring. Two patients (10%) reported incomplete urine collections, but this was less than half of the time. Three patients (15%) reported difficulties in returning the urine bottle to the laboratory. 75% of patients were aware of the dietary requirements associated with 5-HIAA assessment and all followed these requirements. One patient (5%) preferred urine testing, 16 (80%) preferred plasma, and 3 (15%) had no preference. From a cohort of 31 paired samples, there was an 81% concordance rate between urine and plasma 5-HIAA.
Discussion
Our questionnaire results demonstrate that compliance with urinary testing for 5-HIAA was very good in our cohort with infrequent incomplete collections, although many patients did find the requirements impractical and inconvenient. For patients who were aware of the dietary requirements, compliance was 100%. There was a significant positive preference of patients towards plasma testing. Laboratory concordance was very high with increased sensitivity of plasma testing likely to explain most of the discordant results.

DOI: 10.1530/endoabs.96.P9

P10

A prrt patient experience survey – what really matters to patients?

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Introduction/Background
PRRT is a high cost treatment for progressing Neuroendocrine tumours. Patients and healthcare providers invest heavily in the treatment journey that lasts a number of months.
Aims
To assess the level of patient satisfaction with the PRRT service, to indicate areas for possible improvement and good practice and serve as a baseline for future assessments.
Material and Methods
A patient experience survey was devised by the PRRT team and approved by the Hospital after consultation with a patient interest group.
Questions covered following topics
- Side effects and expectations
- How treatment delivered
- Anxieties/concerns
- Covid 19
- Travel, information, Hospital choice

There were 32 Questions – some multiple choice and freehand comments. Demographics "About you" were collected. Opportunity was given to make comments about what we did well, or could improve. 145 surveys were sent out after each treatment cycle with a SAE for return from early 2021 to December 2022. 75 surveys were returned and the data was stored electronically for analysis.

Results
Among the results satisfaction with the PRRT service was in general high. 67 found their treatment very good, 7 good. Information noted to be helpful for 65, to some extent for 9. 5 out of 75 indicated areas where their concerns could have been reduced. Unexpected side effects noted in 20 responses, none in 34. The treatment was assessed to run smoothly and professionally. Negative comments were seen to be either difficult to change or immutable (eg treatment not offered at local hospital (mean distance travelled 31 miles), Covid restrictions, day case treatment) or required attention from the PRRT team (eg update patient information leaflet, increase awareness of post treatment imaging, offer car parking pass).
Conclusions
The survey was a useful tool to assess satisfaction with the treatment process from beginning to end. Not only was it reassuring that satisfaction appeared to be high but improvements to the service could be made in light of comments made.
Plans for the future
Regular surveys updated according to current practice and working environment would help to validate the way in which we work or inform the need for change.

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P11

How gallstones can affect the course of PRRT

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Introduction/Background
Somatostatin analogue injections are a mainstay for the treatment of Neuroendocrine Tumours. Gallstones are a known adverse effect of this treatment. PRRT can bring extra complications for patients having an episode of cholecystitis, biliary colic, cholangitis or pancreatitis.
Aims
To examine a cohort of patients undergoing PRRT, looking for the incidence of gallstones and how many patients suffered gallstones related symptoms during the treatment period. To see what treatment was needed and what effect this had on the course of PRRT.
Material and Methods
The electronic records of all patients who completed four cycles of PRRT from 2020 to early 2023 were examined. There were 51 patients who fitted these criteria. Details of previous cholecystectomy, current presence of gallstones and any history of symptomatic gallstone episodes were collected. Details of episodes around the time of PRRT with any hospital stay, interventions or medical therapies were also collected.
Results
Of these 51 patients receiving four Cycles of PRRT 10 patients had a cholecystectomy prior to treatment, often as part of pancreatic or liver resection. A further 34 did not have gallstones on imaging. Seven patients had gallstones. Three patients were admitted to hospital and required medical or interventional management during the period of their treatment. Two of these happened just after Cycle 4, the third required stenting but did not need a cycle to be delayed. Two had an episode of cholecystitis that was self-limiting or did not require hospitalisation. A further two had previous episodes of cholecystitis, now quiescent.
Conclusions
Patients with known gallstones may be at extra risk of an episode of pain or jaundice requiring medical or interventional therapy during the course of PRRT. This may have an impact on the timing of the planned PRRT and have implications for hospital care if close to the time of a treatment due to radiation precaution restrictions.

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P12

Co-production of Patient Information: a model for future practice?

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Background
Liver transplantation for cancer is evolving offering new opportunities for selected Neuroendocrine Cancer patients in terms of improvements in survival and quality of life. According to the British Medical Association, good quality patient information is fundamental to effective, patient-centred, quality care. It rightly considers patients as partners in their care, empowering them to have a better understanding of their health or illness, to make informed choices and decisions regarding their treatment, and self-manage their conditions as appropriate. *"Co-production involves people who use healthcare services, carers and communities in equal partnership; engaging groups of people at the earliest stages of service design, development and evaluation. It acknowledges that people with 'lived experience' of a particular condition are often best placed to advise on what support and services will make a positive difference to their lives."* (NHS England)
Methods
In partnership with neuroendocrine cancer and liver transplantation experts at Queen Elizabeth Hospital Birmingham, Neuroendocrine Cancer UK (NCUK) worked with with patients, their families and advocates, to develop a patient information resource for those with NET-related liver metastases, being considered for liver transplantation. Development aims were to produce a resource that was grounded in expert clinical information: accessible and appropriately matched to patient (and family) informational needs. Following informal discussions with the wider Neuroendocrine Cancer community - through a variety of forums - a 'topic-specific' workshop was held to explore informational needs. A Working Group of patients, their families and advocates was subsequently established, with a feedback and fact verification communication link with the Birmingham team confirmed. The working group membership included patient experience of liver transplantation, consideration for the programme and a patient advocate with senior nursing experience in both neuroendocrine cancer and liver transplantation.
Results
A finalised version was approved, by all parties, in August 2023: and was published, by NCUK via their website, during Transplantation Awareness Week September 2023.
Conclusion
"Done well, co-production helps to ground discussions in reality, and to maintain a person-centred perspective" (NHS England) - and shows how the 'lived experience' has a unique and valuable contribution to make in information design, development and evaluation. PIL available at: https://www.neuroendocrinecancer.org.uk/wp-content/uploads/2023/03/Sep-2023-completed-Transplant-Fact-sheet-PDF.pdf

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P13

Neuroendocrine cancer: an ideal patient care pathway - addressing inequities in diagnosis, care and support

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Background
Neuroendocrine neoplasms (NENs), include a diverse group of rare neuroendocrine cancers that have increased in incidence in England, by 371%, over the last 3 decades. Prevalence has also risen, with NENs now the 10th most prevalent malignancy in England. Despite this increase, awareness remains low, even amongst healthcare professionals, and patients face significant inequities throughout the entire care pathway, from presentation to follow on care. The average time to diagnosis is 4 years, with less than 17% diagnosed at Stage 1. Despite this exponential increase, there is no inclusion in cancer referral (NG12) guidance and no nationally agreed pathway for appropriately directed onward referral, compounding pre-existing barriers.
Methods
Throughout 2022, Neuroendocrine Cancer UK (NCUK), working with The Health Policy Partnership, collaborated with patients, patient advocates, clinicians, NHS and industry representatives to develop an ideal care pathway for people diagnosed with NEN. Development aims were to address the persistent challenges and inequities in NEN diagnosis and disease management. Multi-stakeholder consultation, alongside shared patient experience and a non-systematic literature review was undertaken to facilitate an analysis of existing services and national plans. A Steering Group was established to collate and provide clear evidence and recommendations for decision-makers. A nation-specific pathway was developed to address unique requirements, we aim for future research to adapt the work to Scotland, Northern Ireland and Wales.
Results
The final draft was completed in May 2023 – endorsed by multi-stakeholder members, professional societies and associated organisations. National initiatives, such as utilisation of the Non-Specific Symptom Pathway, and associated infrastructure, could potential help close the current gap between presentation and diagnosis. Designed to align with these NHS goals, initiatives and programmes, the 'Neuroendocrine Cancer: An Ideal Pathway' was launched, at Parliament on June 14th 2023.

Conclusion
Achieving goals in any healthcare system, often requires innovative solutions. Through collaboration, this pathway has been developed to provide specific workable recommendations, that can be adapted and incorporated into existing NHS initiatives, supporting staff and services to reduce inequities for England's 10th most prevalent cancer population.
We acknowledge and thank our expert advisory group The Ideal Pathway Report is available at https://www.neuroendocrinecancer.org.uk/campaigns/nc-pathway/
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P14

Pituitary disease in MEN1: follow up of patients in Northern Ireland

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Multiple Endocrine Neoplasia type 1 (MEN1) is a rare hereditary autosomal dominant disorder characterised by the occurrence of multiple endocrine tumours, predominantly affecting parathyroid glands, pancreatic islet cells and anterior pituitary. Consensus guidelines for MEN1 recommend intensive clinical, biochemical and radiological surveillance commencing in early childhood. The current regimen, which is subject to debate given lack of strong evidence for some aspects of care, includes annual prolactin/IGF-1 with MRI pituitary 3-5 yearly. The aim is to assess current practice for detection and follow up of pituitary abnormalities in our MEN1 cohort. A single-centre retrospective analysis of all MEN1 patients registered in the new dedicated clinic was performed assessing previous compliance with recommendations with review of MRI findings. Twenty-three patients (M:F,1:1.56, Age 44(20-69)years) were included. All had initial MRI pituitary 1-10(median 2) years following diagnosis. Where normal, recommendations for further were followed in three patients. 39% had pituitary adenoma. Six patients had microadenomas; two microprolactinomas which responded well biochemically and radiologically to dopamine agonist(DA). Two patients with normal pituitary on first screening showed microadenoma at 2 year follow up (both non-functioning). Three patients had macroadenoma; one macroprolactinoma with good response to DA for 30 years then proceeded to surgery when tumour progressed, necrosed and compromised vision. Two non-functioning macroadenomas had surgery, one with recurrence/radiotherapy at 7 years. Three patients had hyperprolactinemia with normal MRI. This review based on a small cohort of Northern Ireland MEN1 patients shows pituitary adenomas in 40%, in line with other studies. There is suggestion that macroadenomas may following a more aggressive course here but further analyses are required. These and improving compliance with consensus guidelines are in progress with the streamlining of MEN1 patients to dedicated service.

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P15

Alternative splicing and its role in the pathology of Pancreatic and Small Intestine Neuroendocrine tumours

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Neuroendocrine tumours, although considered a rare neoplasia, have been increasing in incidence in developed countries over the last few decades. Previous research has identified several genetic components[1]. Despite this there is a gap in our knowledge of the causal mechanisms underlying the development of these tumours, with a low background mutation rate and lack of putative variants suggesting that other mechanisms are responsible. Recent work in Pancreatic Neuroendocrine Tumours (P-NET) has highlighted the dysregulation of alternative splicing as having a plausible role[2]. We investigated whether similar patterns of dysregulation are present in Small Intestine Neuroendocrine tumours (SI-NET), after a pilot study using P-NET tumours. Using Oxford Nanopore long-read cDNA sequencing from 3 P-NET tumour samples and 3 pancreatic tissue healthy controls we set up a pilot study, with a follow-on investigation of 15 participants with SI-NET tumour samples with matched control samples.
Methods
Qiagen AllPrep DNA/RNA (Simultaneous Purification of Genomic DNA and Total RNA from Animal Tissues) was used to extract RNA from fresh frozen tissue. cDNA library preparation performed using the Oxford Nanopore Ligation Sequencing Kit V14 (SQK-LSK114). Sequencing performed on PromethION R10.4.1 flow cells. Long reads were aligned against GRCh38 with Minimap2, followed by transcript assembly using Stringtie in long read mode. Generated GFF annotation was then compared to reference annotation by gffcompare. Gene fusion detection was using the JAFFAL extension. Epi2Me wf-transcriptomics workflow was used for these steps.
Results
Gene fusions differences were detected in known oncogenes such as GNAS, between tumours and controls. Differences in alternate RNA isoforms between the controls and cases were also investigated. These pilot results support the value and originality of long-read sequencing analysis in the discovery of novel molecular players in NETs.
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P16

Sporadic neuroendocrine neoplasms in patients aged 18-40 years in a tertiary referral centre

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Background
The prevalence of neuroendocrine neoplasms (NENs) among younger adults is low; clinical management mirrors that in older cohorts. This study aimed to review presentation, disease trajectory and survival outcomes according to treatment in patients aged 18-40 years (y).
Methods
An electronic database was searched (retrospectively) for patients with NENs (18-40y) (cut-off May 2023). Patients with VHL, tuberous sclerosis, familial adenomatous polyposis or MEN-1/2 were excluded. Patterns of presentation were analysed, including disease primary and tumour grade. Follow-up/survival times were calculated.
Results
68 patient files were searched (2013-2023); 52 were eligible (median age: 34y (21-40), males: $n=27$ (52%). Primary site: lung $n=22$ (42%) (typical lung carcinoid $n=21$), gastrointestinal (GI) $n=20$ (38%), pancreas $n=8$ (15%), biliary $n=2$ (4%)). Fifteen (28.8%) patients presented with Grade 1 (G1) NETs, 7 (13.5%) with G2, 8 (15.4%) with G3; 2 well-differentiated G3 NET, 6 with NECs, & 21 (40.1%) with typical carcinoid, 1 (1.9%) with atypical carcinoid. Thirty-two patients (61.5%) underwent surgery; lung $n=18$, jejuno-ileal $n=5$, pancreas $n=3$, colon & rectum $n=2$ each, duodenum & gall bladder $n=1$ each; 3 cases (5.8%) with palliative intent. In patients undergoing curative resection ($n=29$), median (m) disease-free survival was not reached (NR); 1 (4%) had relapsed disease (colon NEN) & 2 (6.3%) had post-operative synchronous liver metastases. Twenty-one patients (40%) had metastatic disease; 13 received an SSA (lanreotide/octreotide); mPFS was 21.4 months (mo) (all groups). Six patients had PRRT; mPFS NR. Fourteen patients underwent chemotherapy; 11 for metastatic disease and 2 perioperatively (one patient excluded due to lack of data) . mPFS with 1st line chemotherapy was 5.13m ($n=11$) (mPFS with 2nd line chemotherapy was 1.5m ($n=5$)). There were 10 deaths (19.2%): mOS 38.1m; gastric type 2: 30% (G3 NET $n=1$, NEC $n=2$), pancreas: 30% (G2 NET $n=3$), gall bladder: 20% (G3 NET $n=1$, NEC $n=1$), gastric type 3: 10% (NEC $n=1$), duodenum: 10% (NEC $n=1$)).
Conclusions
In this cohort of younger adults, the most common primary site was lung. The majority had surgery with a low recurrence rate. The mPFS on SSAs was favourable compared to historical values. Patients undergoing chemotherapy had a poor prognosis.

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P17

Bridging the gap between neuroendocrine tumour service and nuclear medicine, a new cns role?

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Introduction/Background
Neuroendocrine Tumour (NET) patients can have specialist and complex needs and this can be exacerbated when they have PRRT. A new role was envisaged that would utilise a NET Clinical Nurse Specialist to work with both Nuclear Medicine and the NET team for delivering PRRT.
Aims
As part of the wider NET team the aim for the new CNS was to embed outpatient PRRT delivery, increase capacity and delivery of the treatment and maintain or improve the patient experience with the service.
Material and Methods
The new CNS role commenced November 2020. The post is four days per week, two days spent with the NET CNS team and two with the Nuclear Medicine Therapies team encompassing a number of activities. In the days with the NET team clinics and the NET MDT are attended and work up and peri-treatment patient management attended to. In Nuclear Medicine Department, training has been given to allow the CNS to administer PRRT, attend to admin, monitoring and discharge.
Results
A patient experience survey suggests that the patients feel this to be a valuable role with one main contact point for them over the months that they have their treatment. For the NET team it has freed up other members of the team from routinely dealing with matters concerning PRRT. In Nuclear Medicine the CNS has been able to take a lead in the service provision and development, increasing capacity and therapies delivered by identifying suitable patients and refining treatment pathways.
Conclusions
The hybrid NET/Nuclear Medicine CNS was a new role for the Trust and has been instrumental in driving the service forward and providing a link for both patients and staff between the two services. It could be used as an example for other cross service workings. The role has developed so that the CNS has supervised follow up clinic attendances, non-Medical referrer for imaging and plans to obtain Non Medical Prescribing authority.

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P18

Feasibility of home parenteral nutrition in patients with intestinal failure due to small intestinal neuroendocrine tumours: a systematic review

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Introduction
Maintaining adequate nutritional status can be a challenge for patients with small intestinal neuroendocrine tumours (NETs) and mesenteric lymph node metastasis which can form a mesenteric mass. The preferred treatment option would be resection of this mesenteric mass, however, due to adjacent small bowel loops there is a risk of developing short bowel syndrome (SBS). If the mesenteric mass is not resected there is a risk of developing inoperable malignant bowel obstruction (IMBO) or ischemia. SBS and IMBO are forms of intestinal failure (IF) wherein home parenteral nutrition (HPN) could be considered to maintain patients' nutritional status. One of the concerns regarding HPN is to develop life-threatening septicaemia due to catheter-related bloodstream infection. HPN is widely established in patients with non-NET cancers and supported by guidelines, but it is rarely considered for patients with small intestinal NETs. There exists limited data regarding the use of HPN in patients with small intestinal NETs.
The aim
To summarize existing literature and to create more awareness for HPN in patients with small intestinal NETs.
Methods
A systematic review was performed regarding patients with small intestinal NETs and IF to report on overall survival and HPN-related complications and create awareness for this treatment.
Results
Five articles regarding patients with small intestinal NETs or a subgroup of patients with NETs could be identified, mainly case series with major concerns regarding bias. The studies included 60 patients (range 1–41), 26 males and 34 females, with median age 63-72 year. All studies included patients with SBS and 4 studies included patients with IMBO. The overall survival time varied between 0.5 and 154 months on HPN. However, 58% of patients were alive 1 year after commencing HPN. The reported catheter-related bloodstream infection rate was 0.64–2 per 1000 catheter days.
Conclusion
This systematic review demonstrates the feasibility of the use of HPN in patients with NETs and IF in expert centres with a reasonable 1-year survival rate and low complication rate. Further research is necessary to compare patients with NETs and IF with and without HPN and the effect of HPN on their quality of life.

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P19

Case series of Carcinoid heart presentation with Ovarian neuroendocrine tumour in a tertiary Centre

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Background
Carcinoid heart disease (CHD) is a rare carcinoid syndrome (CS) manifestation, often linked to liver metastasis releasing vasoactive amines. CHD can also result from ovarian neuroendocrine tumours (NETs), an uncommon association.
Cases Presentations
We reviewed three female patients at our NET centre, averaging 63years of age (59-67years). They all had primary ovarian NETs causing CS and CHD.
Discussion
In all patients, investigations identified a diagnosis of CS and CHD secondary to primary ovarian NETs, evident in Tables 1&2. Table2 showed a shared pattern of dilated right ventricles and severe Pulmonary and Tricuspid valves regurgitations, emphasising the cardiac burden. Treatment encompassed both valves replacements alongside ovarian tumour removal, with receiving preoperative somatostatin analogues.One initially declined cardiac surgery but later accepted. Postoperative results uniformly demonstrated disease remission clinically, biochemically and radiologically, reflecting successful tumour resection and cardiac intervention.
Table 1

	preoperative	postoperative
Case1	CgA: 24nmol/L 5HIAA: 857umol/L BNP: 565ng/L	CgA: 6nmol/L 5HIAA: 17umol/L
Case2	CgA: 2504pmol/L 5HIAA: 604umol/L BNP: 1615ng/L	CgA: 27pmol/L 5HIAA: awaiting
Case3	CgA: 39.7nmol/L 5HIAA: 536umol/L BNP: 477ng/L	CgA: 17.5nmol/L 5HIAA: 150umol/L

Table 2

	preoperative	postoperative
Case1	ECHO: EDD 50mm Impaired RV	Awaiting
Case2	MRI: RVEDV 240ml RVEF 63%	Normal RV
Case3	ECHO: RVEDarea 14.8cm2/m2 EDV 36.7ml	RVEF 56+/-6%

Conclusion
Tumour excision and cardiac interventions provide optimistic possibilities for curing CS and CHD linked to primary ovarian NETs. Early diagnosis and multidisciplinary involvement improve clinical outcomes.
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P20

Carcinoid heart disease in patients unfit for surgery: a case series of medically managed patients

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Background
Carcinoid Heart Disease (CHD) is a well-documented but devastating complication of metastatic neuroendocrine tumours (mNETs). Occurring in approximately 20% of patients with Carcinoid Syndrome (CS) the prognosis is poor, with a 3-year survival of 31% versus 68% in patients with mNETs without CHD[1]. Management of these patients requires a multidisciplinary approach to manage tumour load via medical and/or surgical options, alongside control of hormonal excesses, heart failure (HF) management and consideration of valve surgery[2]. Typically, medical management of HF due to CHD has been considered a palliative measure with symptomatic benefit only, rather than a life-prolonging treatment. Valve surgery conversely has been shown to improve life expectancy in these patients from 11 months to 58 months[3]. Unfortunately, the peri-operative mortality of these patients is high with a 17% 30-day mortality[3], therefore appropriate patient selection is crucial.
Case Presentation
We present a review of 4 patients with CHD who were deemed not suitable for surgery and have been subsequently medically managed. Aged between 60-83 years, these patients presented between 2019-2022 with symptoms of CS and were subsequently diagnosed with mNETs and CHD. All were deemed unfit for surgery and were managed with somatostatin analogues alongside diuretic therapy.
Discussion
To date the survival of these patients has exceeded the previously quoted life expectancy of 11 months (1 death at 47 months, others 11-34 months and ongoing).
Conclusion
We demonstrate that with excellent medical management patients could expect some survival benefit as well as improvement to symptoms and quality of life.
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P21

The frequency of carcinoid heart disease in our neuroendocrine tumour cohort: a tertiary centre experience

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Introduction
Neuroendocrine tumours (NETs) can release harmful vasoactive substances into the systemic circulation, causing the characteristic features of carcinoid syndrome (CS) such as flushing, diarrhoea and bronchospasm. Approximately 20% of patients with CS develop carcinoid heart disease (CHD) due to progressive valve thickening, retraction and reduced mobility. CHD primarily affects the right-sided valves resulting in tricuspid and/or pulmonary regurgitation, volume and pressure overload, right ventricular dilatation and subsequent failure. The left-sided valves can be involved if a patent foramen ovale (PFO) allows the substances to bypass pulmonary degradation. Patients with CHD have a worse prognosis, with average survival half that of NET patients without CHD.
Aim
We aim to identify the frequency of CHD in a subsection of our NET population.
Methods
We reviewed the electronic records of patients at our centre between January 2018 and December 2020 with a NET diagnosis. Data were collected on demographics, primary NET site, tumour grade, liver metastases, CS, CHD and echocardiography findings in patients with CHD.
Results
We identified 573 patients (mean 64 years, 58% male). The small bowel was the most common primary tumour site (46%), grade I tumours were the most common (63%) and 38% had liver metastases. Twenty-two percent had CS and of these, 24% had CHD. Severe tricuspid regurgitation was the most frequent finding on echocardiogram (93%), and pulmonary regurgitation of moderate or severe classification was seen in 43%. A PFO was documented in 47% with CHD.
Conclusion
The frequency of CHD in a snapshot of our NET population reflects previous data. As CHD confers a poor prognosis, research is needed to enhance our understanding of the pathophysiology behind valve destruction to develop effective therapies.

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P22

Successes and challenges in the combined neuroendocrine tumour and carcinoid heart disease service university hospitals birmingham: a neuroendocrine tumour clinical specialist nurse perspective

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Introduction
The Birmingham Neuroendocrine Tumour (NET) and Carcinoid Heart Disease(CHD) services evolved into a combined and bespoke specialist service in 2018, with the introduction of the enhanced CHD pathway. This involved discussion at the CHD NET MDT , CHD work-up in the inpatient or outpatient setting and a clinical review in the bespoke CHD NET clinic. The CHD NET pathway is now embedded and well-established at our centre. We have a consistent flow of CHD referrals from all over England, including other ENETS Centres of Excellence. It is well recognized that early diagnosis and referral to an expert, experienced centre is key to improving patient prognosis and outcomes.
Aims
To demonstrate the successes in the CHD NET service and the challenges we face.
Methods
Data was analysed from the NET CNS CHD NET data base and the Trusts Informatic systems.
Results
69 patients were referred to the CHD MDT between January 2019 and October 2023. 34 patients proceeded with CHD surgery. 19 M and 15 F. Age range 46-79 years: Mean 65.1. 34 patients did not proceed with CHD. 18 M and 17 F. Age range 54-86 years: Mean = 69.2. 1 patient remains under surveillance for potential CHD. The main reasons listed for not proceeding with surgery include frailty, sarcopenia, advanced disease, co-morbidities and considered too high risk.
Conclusion
The enhanced CHD Pathway continues to provide systematic framework that ensures we continue to do the best for this complex group of patients. Future plans include, analysing the outcomes between patients who proceeded with CHD surgery and those who did not proceed with surgery, but remained on medical management.

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P23

Reasons patients with carcinoid heart disease are deemed unfit for surgery: our tertiary centre experience

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Introduction
Carcinoid heart disease (CHD) is a rare complication of neuroendocrine tumours (NETs) and carcinoid syndrome (CS). Approximately one in five patients with CS go on to develop CHD, which primarily affects the right side of the heart; leading to thickened, retracted, immobile and regurgitant cardiac valves that ultimately result in right ventricular (RV) dilatation and dysfunction 1 . Patients are referred for valve replacement if they have severe symptomatic disease or evidence of RV

failure and a post-operative life expectancy of ≥12 months2 . However, not all these patients go on to have definitive cardiothoracic surgery.
Aim
We aim to identify the reasons patients who met the criteria for valve surgery were not operated on at our centre.
Methods
We reviewed the available electronic medical records of all patients diagnosed with CHD at our tertiary centre, collecting data on demographics and documented rationale for not undergoing surgery.
Results
We identified 26 patients diagnosed with CHD from 2013 to present day (mean age 69 years, 50% female). The most common reasons patients did not undergo surgery were due to active weight loss/sarcopenia (37%) and frailty (33%). Additional reasons included: advanced age (9%), NET progression (9%), patient choice (5%) and others (7%) - including infection, deranged liver profile and symptomatic patent foramen ovale not amenable to percutaneous closure.
Conclusion
In our cohort weight loss and sarcopenia were the most common reasons patients were deemed unfit for cardiac surgery. This highlights the importance of prompt multidisciplinary team input including dietician review in this patient group.
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P24

Painful cutaneous metastases in well differentiated bronchial neuroendocrine tumour (NET); could serotonin be the guilty molecule?
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Cutaneous and subcutaneous metastases are very rare in well differentiated neuroendocrine tumours with a handful of case reports available to date. Head & neck and bronchial NET seem to show this feature most commonly. Such metastases can be very painful and display allodynia (pain occurring on exposure to non-painful stimuli), even if growing very slowly. We describe the case of a young patient who underwent surgical resection of a typical bronchial NET who developed painful, subcutaneous lesions 2 years after surgery. Imaging showed that some lesions had been present at time of original surgery and had grown marginally. We discuss the dilemmas in the management of a young person with disseminated well differentiated NET as well as options for symptomatic relief in this case. We also explore the possible mechanisms underlying pain and allodynia with such lesions. Finally, we place this case within the context of the limited literature on subcutaneous well differentiated NET metastases.

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P25

Sequencing of treatment in G1-2 pancreatic neuroendocrine tumour - a case study
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Herein, we present the case of a 48yo Caucasian male diagnosed with a well differentiated (WD) pancreatic NET. At primary resection in 2014 pathological staging was pT3N1M0 R0 with Ki67 4%. 5 years later he developed recurrence in local lymph nodes and started on lanreotide followed by IRE on subsequent progression. In 2020, there was strongly DPET-avid metastases in mesenteric nodes and liver, so he was enrolled onto the COMPETE trial1. There was sequential progressive disease in the liver after PRRT (PFS 34.2 months) and 5 cycles of everolimus (PFS 7.8 months). He had further widespread disease progression on both DPET and FDG PET in 2023. Capecitabinetemozolamide (CAPTEM) and zometa was commenced and a liver biopsy showed a WD NET with Ki67 19%. He deteriorated clinically after 3 cycles so did not receive any further systemic treatment (OS 9.5 years).
Conclusions
Scheduling of treatment in WD G2 NET represents a challenging landscape. Though CAPTEM is an established first-line treatment with prospective data2, would an earlier biopsy prompted us to use 5FU based treatment3,4 given the rapid rate of progression. Positive FDG PET is significantly associated with reduced overall survival5, thus this may help to guide treatment choice.
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Case report: a rectal neuroendocrine tumour with dynamic grade and clinical behaviour
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Introduction
Neuroendocrine tumours (NETs) may change grade and clinical behaviour substantially over time, requiring shifts in management strategy.
Case Presentation
A 53-year-old lady presented with abdominal bloating and diarrhoea. Diagnostic MRCP and CT-CAP confirmed metastatic cancer, with bilobar liver metastases and a sclerotic lesion in the right ilium. Her disease was 68Ga-DOTATATE-avid. Rectal biopsy confirmed a grade 1 rectal primary lesion (Ki67 index 2%). Liver biopsy revealed a grade 2 well-differentiated NET (Ki67 index 5%). She initiated lanreotide therapy but progressed after 6 months in both the liver and mesorectal lymph nodes. Subsequently, she was switched to capecitabine-temozolamide but progressed after 3 cycles. She was converted to second-line peptide receptor radionucleotide therapy (PRRT), achieving stable disease for approximately two years. She subsequently developed abdominal pain and was found to have marked progression in the liver. She was admitted for repeat liver biopsy and transarterial embolization of her symptomatic metastases. New histology showed a grade 3 tumour (Ki67 index 41%). She was therefore switched to chemotherapy-based strategy with FOLFOX. Molecular studies on the new tissue unfortunately revealed no actionable mutations.
Conclusion
NETs may change grade during treatment. In such cases, repeat biopsy and further molecular analyses can inform alternate treatment approaches.

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Which cancer? Clinical decision making in a case of concurrent metastatic neuroendocrine tumour and breast cancer

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Background

Neuroendocrine tumours (NETs) are a heterogenous group of malignancies that frequently metastasise to other organs. Both breast cancer and NETs have a predilection for liver, lymphatic and bone metastases. We report the investigations and management of a patient with concurrent small bowel NET and breast cancer.

Case

66 year-old female. Presented with 2 years of abdominal pain, diarrhea and flushing. Octreotide scintigraphy and biochemical investigations diagnosed metastatic small bowel NET with carcinoid syndrome. After 1 year somatostatin analogue therapy, surveillance imaging showed evidence of disease progression. Pre-Lutathera biopsy: Ki-67 1-2 %, Grade 1 NET. Underwent small bowel resection and anastomoses following obstruction. Surgical histology: Ki-67 4-5 %, Grade 2 NET. Three years following NET diagnosis, the patient-identified a breast lump. Triple assessment: Grade 1 invasive tubular carcinoma, ER 8/8, HER2 negative. Subsequently underwent wide local excision, sentinel lymph node biopsy and hormonal treatment. Subsequent NET surveillance imaging: Enlarging liver metastases while stable disease elsewhere. Biopsy of liver metastases: Ki-67 10 %, Grade 2 NET. Excludes metastatic breast cancer. MDT advised liver metastasectomy in view of oligoprogression.

Discussion points

(1) Treatment strategy was dependent upon correct metastases characterisation. (2) Successive biopsies showed increasingly aggressive NET features across 5 years. (3) Surgery can be an appropriate option, especially if one lesion is behaving more aggressively.

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