Survey of current practice regarding Functional Imaging (FI) and Peptide Receptor Radionuclide Therapy (PRRT) within the CommNETS Collaboration

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Background: The CommNETS Collaboration (CommNETS) is a newly formed multidisciplinary group of Neuropeptide/Tumour (NET) researchers, clinicians and practitioners from Australia (AU), Canada (CA) and New Zealand (NZ).

Methods: A Delphi process identified Functional Imaging (FI) and Peptide Receptor Radionuclide Therapy (PRRT) as research priorities for the group. FI and PRRT are increasingly used for the investigation and management of NETs but considerable global variation exists in access to, and use of, these modalities. Figure 1 shows current availability in AU, CA and NZ. There are no local consensus guidelines regarding the integration of these modalities so the research seeks to determine current practice within CommNETS.

Objectives: To identify and compare the: availability and accessibility of FI and PRRT. 
Current protocols and preferences.

Methods: All CommNETS PRRT centres were sent 2 electronic surveys that were customised for Medical Oncology (MO) and Nuclear Medicine (NM). An additional survey was also sent to centres outside the MO and NM. Surveys were completed by the respective site lead. Each adaptive survey had up to 40 (AO) to 40 (CA) questions on demographics, current availability on accessibility of FI modalities and PRRT modalities of care and perceived barriers to access. 150 surveys included detailed PRRT questions (surveys, however, whilst MO surveys included specific chemotherapy questions. Descriptive and inferential statistics including non-parametric analyses (Mann-Whitney-U, Kruskal-Wallis tests) were performed to evaluate variability.

Results: 15 responses were received from the 8 PRRT centres between April to May 2019: AU (n=3), CA (n=4), NZ (n=8); as they do not have PRRT.

- The response rate was 100%.
- All were academic centres with 80% receiving up to 10 new and up to 40 follow-up NET patients per month.

1. Availability of FI and PRRT in CommNETS centres.

2. Survey of current practice regarding Functional Imaging (FI) and Peptide Receptor Radionuclide Therapy (PRRT) within the CommNETS Collaboration.

3. This is the first survey to assess the current availability and accessibility of FI and PRRT within the CommNETS countries.

4. Ga-68 PET and FDG-PET scans were most preferred by all sites. Other scans were used in specific situations.

5. Although current guidelines for NETs, FDG-PET scans were often ordered (83%) for grade 2 or 3 NETs. Ga-68 PET scans were most preferred for government funding. To assess response in neuroendocrine tumours (NETs) PRRT, 20% used Ga-68 PET at 6-monthly intervals and 36% used both Ga-68 and FDG-PET scans.

6. Lutetium-177 was the standard therapeutic isotope for most indications and was universally available at all centres. One site used Indium-111 for significant bone involvement and Yttrium-90 for bulky disease.

7. 4 cycles of PRRT was universal but intervals varied between every 9 wk (60%) to 15 wk (20%) to 16 wk (10%), usually without any maintenance therapy (10%).

8. Pre-investigations to assess response after PRRT varied significantly between clinicians (P<0.001) [Figure 3]. In addition to clinical and haematologic follow-up, CT/MRI and FI were used at varying intervals, reflecting the heterogeneity of practice.

9. Use of radiolabelling chemotherapy with PRRT was common (70%) but there was no standard regimen across centres (Figure 5).

10. The main barrier to accessing Ga-68 PET or PRRT was lack of funding (Figure 4). PRRT is not always ordered but is only available on site in CA (Figure 7).

11. The multidisciplinary approach to NET management encompassed a broad range of specialties but were included in CA (Figure 6).

12. Perceived usefulness of modalties for NET management (Figure 9).

13. There was wide variability in the perceived usefulness of various modalities in NET management (P<0.01). Strongest preferences were for PRRT and Ga-68 PET with Oncology centres considering chemotherapy to be the least 'beneficial' but others disagreed, reflecting the need for further study.

Conclusions: This is the first survey to assess the current availability and accessibility of FI and PRRT within the CommNETS countries.

Ga-68 PET and FDG-PET scans were the preferred FI modality for diagnosis and follow-up. Variation in use of these scans at diagnosis and follow-up reflects the need for further study and a standardised approach. Access to Ga-68 PET and PRRT is largely limited by funding and our results highlight the disparity of per-capita access in NZ and CA relative to AU.

Future collaborative efforts can advocate for improved access and develop best practice guidelines for the optimal use of FI at diagnosis and follow-up and the delivery of PRRT.