Background

- Phaeochromocytoma (PCC) are rare neuroendocrine tumours (Figure 1) arising from chromaffin cells and are typically found in the adrenal medulla (80-85% of cases). Paraganglioma (PGL) are closely related extra-adrenal tumours and can arise in sympathetic, therefore potentially catecholamine producing (Figure 1) or parasympathetic, non-catecholamine producing ganglia.

- Quoted estimates of the prevalence of PCC in hypertensive populations vary between 0.1-0.6% (1). Advances in imaging and screening for familial disease have led to increased diagnosis in normotensive and asymptomatic patients. It is estimated that 1.5-23% of all adrenal incidentalomas are PCCs (2).

- PCC have long been regarded as a difficult pathology to diagnose and thus there is a requirement for sensitive and specific diagnostic tests.

- Recommended first line biochemical investigation for PCC/PGL is the measurement of plasma and urine metadrenalines (3) (Figure 1 (C-D)).

- Where there is a high degree of clinical suspicion plasma metadrenalines are the preferred test due to their superior diagnostic sensitivity and specificity.

Aims

- To introduce a liquid chromatography tandem mass spectrometry (LC-MS/MS) method for the measurement of plasma metadrenaline and normetadrenaline.

- To establish a healthy population reference range for plasma normetadrenaline and metadrenaline.

Tools – Application of Covey’s Seven Habits

- Sharpen the Saw
- Begin with the End in Mind
- Be Proactive
- Put First Things First
- Think Win-Win
- Seek First to Understand, Then to be Understood
- Synergise

Outcomes

- Obtained financial support and approval from the Department of Clinical Biochemistry at RLBUHT.
- Obtained approval and sponsorship from the Department of Research and Development at the RLBUHT.
- Obtained ethical approval from the LREC to allow blood samples to be collected from healthy volunteers to establish a reference range for plasma metadrenalines.
- Started recruitment of healthy volunteers (n=30) and collection of blood samples (n=20).
- MSc research proposal accepted by University of Ulster and practical laboratory work started.

Challenges

- Obtaining financial support and approval from the Department of Clinical Biochemistry at the Royal Liverpool and Broadgreen University Hospitals Trust (RLBUHT).
- Obtaining approval and sponsorship from the Department of Research and Development at the RLBUHT.
- Obtaining ethical approval from the Local Research Ethics Committee (LREC) to allow blood samples to be collected from healthy volunteers to establish a reference range for plasma metadrenalines.
- Recruiting 120 healthy volunteers and arranging for blood samples to be collected by clinical staff.
- Mentoring and coaching a MSc student to perform analytical work required to measure plasma metadrenalines.

Future Work

- Finish LC-MS/MS method validation for the measurement of plasma metadrenalines.
- Complete recruitment of healthy volunteers and collection of blood samples so a healthy population reference range can be established.
- Continue mentoring MSc research student so their dissertation is submitted and they obtain their degree.

References


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