Phaeochromocytomas and Paragangliomas

NeuroEndocrine Cancer Australia

What are phaeochromocytomas and paragangliomas?

Phaeochromocytomas and paragangliomas are types of neuroendocrine tumours. Since 2022 the World Health Organisation (WHO) classification recognises phaeochromocytomas and paragangliomas have metastatic potential.

Phaeochromocytoma

Phaeochromocytomas are rare neuroendocrine tumours that form in chromaffin cells within the adrenal medulla, the inner part of the adrenal glands. The adrenal glands are located on top of the kidneys. The adrenal medulla normally produces important hormones called catecholamines, such as adrenaline, noradrenaline and dopamine. These hormones control heart rate, blood pressure and the stress response.

Some phaeochromocytomas have no symptoms and can remain undiagnosed for many years. The majority of phaeochromocytomas produce excessive amounts of hormones leading to significant symptoms:

- Rapid heart rate (palpitations)
- Excessive sweating
- Severe headaches
- High blood pressure
- Feeling anxious
- Loss of weight

Paraganglioma

Paraganglia are groups of hormone producing cells found near nerve pathways and blood vessels. A paraganglioma is a type of neuroendocrine tumour involving the paraganglia. They are located in the head, neck, thorax, abdomen and pelvis.

Types of paragangliomas

- **Parasympathetic paragangliomas** are mostly found in the head and neck, the majority of paragangliomas in this region of the body do not secrete hormones and rarely metastasize (spread). There are rare instances where hormone secretion occurs and as a result associated symptoms have happened in this type of paraganglioma.
- **Sympathetic paraganglioma**, found in the thorax, abdomen and pelvis, often secrete hormones such as adrenaline or noradrenaline.

Like phaeochromocytomas, paragangliomas can disrupt the balance of normal hormone production leading to excessive amounts of hormones and symptoms such as:

- High blood pressure (hypertension)
- Rapid heart rate (palpitations)
- Excessive sweating (diaphoresis)
- Severe headaches
- Anxious feelings
- Loss of weight

Some paragangliomas have no hormone related symptoms, however they may cause other symptoms as a result of the position or size of the tumour:

- Swelling at the site of the tumour
- Vision problems
- Hearing loss
- Dizziness

Genetics

It is essential for anyone diagnosed with a phaeochromocytoma or paraganglioma to have genetic counselling with an experienced medical or genetic specialist.

"The risk of an inherited cause is particularly high for people with phaeochromocytoma and paraganglioma, as such it is essential genetic counselling and testing is routinely performed".

Optimal Care Pathway for Neuroendocrine Tumours 1st Ed (2022), pg 26

The following familial syndromes are linked to paragangliomas and phaeochromocytomas:

- MEN (Multiple Endocrine Neoplasia) 2 & 3 RET gene mutation

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- MEN (Multiple Endocrine Neoplasia) 5 – MAX gene mutation
- Succinate Dehydrogenase gene complex (SDHA,B,C,D)
- NF1 (Neurofibromatosis)
- VHL (Von Hippel-Lindau Syndrome)

Medical Oncologists, Familial Cancer Centres and Genetic Services can provide further information on genetic counselling and guide appropriate genetic screening and testing.

Investigations

Specific investigations related to paraganglioma and phaeochromocytoma include:

- Plasma metanephrine, normetanephrine and 3-methoxytyramine
- Urinary metanephrine/normetanephrines (catecholamines)
- CT
- MRI
- Gallium (Ga) 68 - Dotatate PET Scan
- I-123-MIBG or I-131 MIBG imaging (for phaeochromocytomas and paragangliomas) – choice of imaging depends on availability and local preference.

Treatments

Surgery

Surgery can be undertaken to remove a paraganglioma or phaeochromocytoma that is localised (has not spread to other areas of the body).

- Prior to surgery control of blood pressure with medication is essential for all phaeochromocytomas and paragangliomas that are hormone secreting.
- If surgery requires both adrenal glands to be removed, lifelong corticosteroid and mineralocorticoid replacement therapy will be required.

Chemotherapy

Chemotherapy is a drug treatment used when cancer has spread to other areas of the body. Chemotherapy kills fast growing cancer cells to destroy cancer cells and prevent tumour growth.

Targeted Molecular Therapies

These medications target and block specific molecules involved in tumour cell growth and blood vessel formation. By blocking these processes tumour growth can be slowed and controlled.

- Tyrosine Kinase Inhibitors (TKIs) eg; Sunitininb is on the PBS for the treatment of progressive metastatic phaeochromocytomas and paragangliomas when there is a germline mutation in SDH subtypes and RET
- Hypoxia- inducible factor 2 alpha inhibitor (HIF-2) e.g. Belzutifan for the treatment of VHL

Radionuclide Therapies

These therapies use radioactive substances injected into the body. The radioactive substance travels via the blood stream where it targets and binds to the tumour delivering radiation directly and killing the tumour cells.

- Peptide Receptor Radionuclide Therapy (PRRT)
- Radioactive iodine MIBG (131- MIBG)

Follow up and ongoing care

- A long-term ongoing follow-up plan with a medical specialist is essential for all people diagnosed with phaeochromocytoma or paraganglioma.

If you need further information about paragangliomas or phaeochromocytomas, please contact your treating team or the **NET nurses at NeuroEndocrine Cancer Australia on 1300 287 363** Monday-Friday 9am-5pm.