

Predictors for Perioperative Hemodynamic Instability for Pheochromocytoma and Paraganglioma

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Introduction

Pheochromocytoma and paraganglioma (PPGL) are rare neuroendocrine tumors characterized by paroxysmal release of catecholamines. Surgical resection remains the gold standard curative treatment. However, perioperative hemodynamic instability (HI) is the major concern.

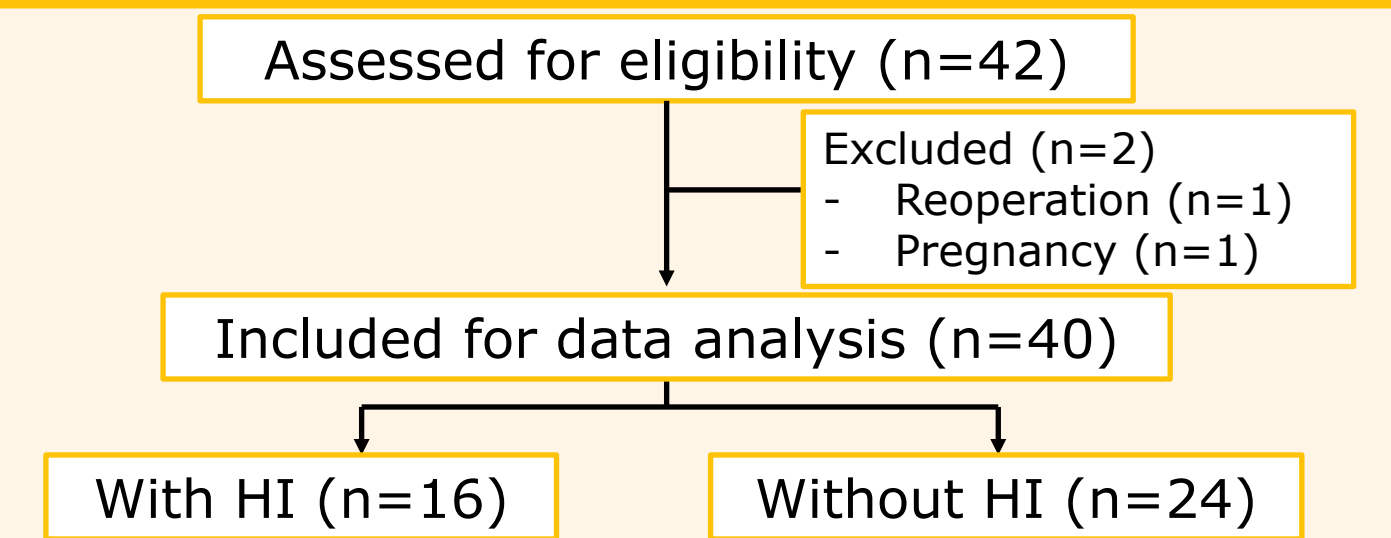


To evaluate the risk factors of perioperative HI for PPGL

Materials and Methods

Study Design	Retrospective observational study
Study Period	August 2012 – October 2023
Settings	Prince of Wales Hospital, Hong Kong
Inclusion Criteria	- Patients having operation for PPGL - ≥18years old
Exclusion Criteria	- Pregnancy - Reoperation
Primary Outcome	Peri-operative HI: ✓ ≥1 episode of systolic blood pressure >200mmHg and/or ✓ Mean blood pressure <60 mmHg
Secondary Outcomes	• Intraoperative and postoperative hemodynamic parameters • Morbidity and mortality • Tumor characteristics

Results



Perioperative outcomes	Value
Operative time (mins)	159.5 ± 95.9
Blood loss (ml)	196.0 ± 839.8
Peak systolic BP (mmHg)	180.9 ± 30.0
Trough systolic BP (mmHg)	77.1 ± 11.9
ICU stay (hours)	23.4 ± 9.8
Mortality	0
Morbidity (Clavien-Dindo Classification)	
- I, n(%)	2 (5)
- II, n(%)	3 (7.5)
- III-V, n(%)	0



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	Odds Ratio (95% CI)	p-value
✓ Age ≥ 50 years	6.67 (1.13 – 167.7)	0.04
✓ Urine Metanephrine 10x Upper Range of Normal (ULN)	13.2 (1.14 – 46.2)	0.04



CONCLUSION

Age ≥50 and 10x upper limit of normal in urine metanephrine are predictors of perioperative hemodynamic instability for pheochromocytoma and paraganglioma

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Baseline Characteristics	With HI (n=16)	Without HI (n=24)
Gender, n(%)		
- Male	4(25)	10(41.7)
- Female	12(75)	14(58.3)
Age (years)	56.9±14.4	47.3±16.4
BMI (kg/m ²)	23.1±4.4	23.4±3.8
ASA, n(%)		
- ASA 1	0	1(4.2)
- ASA 2	4(25)	10(41.7)
- ASA 3	12(75)	13(54.2)
- ASA 4	0	0
Comorbidities, n(%)		
- Hypertension	5(31.3)	2(8.3)
- Diabetes Mellitus	3(18.8)	2(8.3)
- Dyslipidemia	3(18.8)	2(8.3)
- OSAS	1(6.3)	3(12.5)
- Cardiovascular disease	1(6.3)	3(12.5)
- Cerebrovascular disease	0	1(4.2)
Genetic syndrome, n(%)		
- MEN Syndrome	1(6)	1(4.2)
- VHL disease	0	2(8.3)
- SDHx gene mutation	0	3(12.5)
Size of tumor (cm)	5.9±3.5	4.2±2.2
Urine metanephrine (nmol/d)	3063.5 ± 4588.8	644.0 ± 750.3
Urine normetanephrine (nmol/d)	1683.1 ± 2063.6	2087.5 ± 2869.7
Urine methoxytyramine (µmol/d)	325.1 ± 275.1	373.3 ± 239.4
Phenoxybenzamine (mg)	55.0±33.5	54.8±32.6
α-blockade duration (day)	100.1±64.1	81±49.8
Approach, n(%)		
- Laparoscopic	10(34.5)	19(65.5)
- Open	6(54.5)	5(45.5)