



RESEARCH ARTICLE

Spectrum of Sellar and Parasellar Region Lesions: A retrospective study from Basrah, Iraq [version 1; referees: awaiting peer review]

Abbas Ali Mansour, Ali Hussain Ali Alhamza, Ammar Mohammed Saeed Abdullah Almomin, Ibrahim Abbood Zaboony, Nassar Taha Yaseen Alibrahim, Rudha Naser Hussein, Muayad Baheer Kadhim, Haider Ayad Yassin Alidrisi, Hussein Ali Nwayyir, Adel Gassab Mohammed, Dheyaa Kadhim Al-Waeli, Ibrahim Hani Hussein

Faiha Specialized Diabetes, Endocrine and Metabolism Center (FDEMC), Diabetes, Endocrine and Metabolism Division, Department of Medicine, Basrah College of Medicine, Hattin post office. P.O Box: 142, Basrah, 61013, Iraq

v1 First published: 06 Apr 2018, 7:430 (doi: [10.12688/f1000research.13632.1](https://doi.org/10.12688/f1000research.13632.1))
Latest published: 06 Apr 2018, 7:430 (doi: [10.12688/f1000research.13632.1](https://doi.org/10.12688/f1000research.13632.1))

Abstract

Background: Sellar and parasellar region lesions spectrum includes a wide variety of diseases. This study aimed at providing a comprehensive overview of such lesions in patients from Faiha Specialized Diabetes, Endocrine and Metabolism Center (FDEMC) in Basrah (Southern Iraq).

Methods: Retrospective data analysis from FDEMC for the period January 2012 through June 2017. We included all patients with sellar and parasellar region lesions who received a MRI scan on their pituitary region

Results: The total enrolled patients were 232 (84 men and 148 women), with age range 15-75 years. Pituitary disease and adenoma were more common among women. Those with macroadenoma were older than those with microadenoma, with nearly equal gender prevalence of macroadenoma. Pituitary adenoma constituted the bulk of pituitary disease in this setting (67.2%). Growth hormone secreting adenoma were the most common adenoma seen in 41.0%, followed by clinically non-functioning pituitary adenoma (NFPA) in 31.4% and prolactinoma in 26.9%. About 64.8% of pituitary adenoma was macroadenoma. Macroadenoma was seen in 73.4% of growth hormone secreting adenoma (acromegaly), 61.2% in NFPA and 62.0% of prolactinoma (of them six were giant prolactinoma).

Conclusion: Pituitary adenoma constituted the bulk of sellar and parasellar region lesions, growth hormone secreting adenoma is the the most common adenoma followed by NFPA and prolactinoma due to referral bias. A change in practice of adenoma treatment is needed.

Open Peer Review

Referee Status: Awaiting Peer

Review

Discuss this article

Comments (0)

Corresponding author: Abbas Ali Mansour (abbas.mansour@fdmc.iq)

Author roles: **Mansour AA:** Conceptualization, Data Curation, Investigation, Methodology, Supervision, Validation, Writing – Review & Editing; **Alhamza AHA:** Investigation, Methodology, Project Administration; **Almomin AMSA:** Project Administration, Resources, Visualization, Writing – Original Draft Preparation; **Zaboon IA:** Data Curation, Investigation, Validation, Visualization; **Alibrahim NTY:** Methodology, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Hussein RN:** Resources, Software, Supervision, Validation, Visualization, Writing – Original Draft Preparation; **Kadhim MB:** Conceptualization, Formal Analysis, Resources, Software; **Alidrisi HAY:** Investigation, Supervision, Validation, Writing – Review & Editing; **Nwayyir HA:** Investigation, Resources, Software, Supervision, Visualization; **Mohammed AG:** Investigation, Supervision, Visualization, Writing – Original Draft Preparation; **Al-Waeli DK:** Data Curation, Funding Acquisition, Investigation, Validation; **Hussein IH:** Data Curation, Formal Analysis, Funding Acquisition, Software, Validation, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

How to cite this article: Mansour AA, Alhamza AHA, Almomin AMSA *et al.* **Spectrum of Sellar and Parasellar Region Lesions: A retrospective study from Basrah, Iraq [version 1; referees: awaiting peer review]** *F1000Research* 2018, 7:430 (doi: [10.12688/f1000research.13632.1](https://doi.org/10.12688/f1000research.13632.1))

Copyright: © 2018 Mansour AA *et al.* This is an open access article distributed under the terms of the [Creative Commons Attribution Licence](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. Data associated with the article are available under the terms of the [Creative Commons Zero "No rights reserved" data waiver](#) (CC0 1.0 Public domain dedication).

Grant information: The author(s) declared that no grants were involved in supporting this work.

First published: 06 Apr 2018, 7:430 (doi: [10.12688/f1000research.13632.1](https://doi.org/10.12688/f1000research.13632.1))

Introduction

Sellar and parasellar region lesions spectrum includes a wide variety of conditions ranging from adenoma to empty sella syndrome, apoplexy, congenital or acquired condition¹⁻⁴. Other than adenoma, genetic causes of pituitary disease are increasingly recognized³.

Pituitary adenomas are not rare and account for 20% all intracranial tumors^{5,6}. Half of these secrete hormones, and half are microadenoma². Clinically non-functioning adenomas (NFPA) constitute 15–54% of all adenomas. Prolactinomas accounts for 32–66%, growth hormone secreting adenoma (acromegaly) account for 8–16%, adrenocorticotrophic hormone (ACTH)-secreting adenoma (Cushing's disease) forms 2–6%, and TSHoma accounts for less than 1%^{2,7}. These pituitary adenomas behave as typical or have a more aggressive to malignant behavior^{6,8}. They can cause mass effect, in addition to hypersecretion or hypopituitarism^{7,9}.

Advances in neuroradiology have opened the door for earlier and easier diagnosis of pituitary disease and other sellar and parasellar lesions¹⁰.

The Faiha Specialized Diabetes, Endocrine, and Metabolism Center (FDEMC) in Basrah is a tertiary referral center receiving patients with pituitary diseases from most of Southern Iraq. The FDEMC is trying to adapt the three mission criteria of the pituitary center of excellence, which includes care and support for patients, fellowship training and contribution to pituitary disease research¹¹. To our knowledge, there are no studies on sellar and parasellar region lesions in Iraq.

This study aimed at providing a comprehensive overview of sellar and parasellar region lesions for patients from FDEMC in Basrah (Southern Iraq).

Methods

Study design

Retrospective data analysis of the FDEMC database for the period January 2012 through June 2017.

Inclusion criteria: We included all patients, age range 15–75 years with sellar and parasellar region lesions who have received a MRI scan on their pituitary region.

Exclusion criteria: patients with sellar and parasellar region lesions who did not receive a MRI scan.

Definition of variables

Sequences of pituitary MRI imaging were classified according to the international standard¹². Adenomas were classified as macroadenoma if these were 10 mm or more in size, while microadenoma if less than 10 mm and giant prolactinoma if these were 4 cm and above².

Pituitary adenoma, NFPA, prolactinoma, growth hormone secreting adenoma (acromegaly), and ACTH-secreting adenoma were defined according to the usual criteria^{2,8,12}.

Hypopituitarism, whether postoperative or in those with or without adenoma, was considered according to the hormonal assessment with basal and dynamic hormonal tests¹³.

Empty sella syndrome, whether primary or secondary to surgery or apoplexy, were considered based on MRI findings¹⁴.

Craniopharyngioma diagnosis was based on clinical behavior with MRI and pathological diagnosis.

Data analysis

Analysis was done in July 2017. All patients with labeling diagnosis of pituitary disease were included. Data were included on an Excel spreadsheet and transferred to SPSS for Windows, Version 23.0 (SPSS Inc., Chicago, USA).

Continuous variables were summeried as number and percentage and dichotomous varibales as mean \pm SD.

Ethics statement

The ethics committee of the Medical College in Basrah University approved the study design and the Center authorities agreed to review the patients data. At the time of registration in the Center, all patients included in this study approved the use of their clinical information for research purposes.

Results

A total of 232 patients were included in this study. Pituitary disease and adenoma were more common among women (Table 1). Those with macroadenoma were older than those with microadenoma with nearly equal gender prevalence of macroadenoma. Four patients died; two with growth hormone secreting adenoma (acromegaly) and advanced cardiovascular disease, and two with prolactinoma that caused hypopituitarism and adrenal failure.

Table 2 shows that pituitary adenoma constituted the bulk of pituitary disease in this registry (67.2%). Growth hormone secreting adenoma (acromegaly) were the commonest adenoma seen in 41.0% followed by NFPA in 31.4% than prolactinoma in 26.9%. Hypopituitarism due to various causes was observed in 24.5% in this series. Empty sella syndrome, whether primary or secondary, were seen in 9.4%. Craniopharyngioma and Sheehan syndrome were seen in 3.9% each. Meningioma based on MRI finding was been observed in 4 patients (1.7%).

In this study, 64.8% of pituitary adenoma were macroadenomas (Table 3). Macroadenoma was seen in 73.4% of acromegaly, 61.2% in NFPA and 62.0% of prolactinoma (of them six were giant prolactinoma).

In Table 4 we see hypophysectomy whether transsphenoidal or transcranial or both was performed in 45 patients with pituitary adenoma (28.8%). Stereotactic radiosurgery is done in 5 patients (3.2%) with pituitary adenoma. Growth hormone secreting adenoma (acromegaly) and prolactinomas were treated primarily with medical therapy (71.4% and 76.1% respectively).

Table 1. Sellar and parasellar region lesions patients demography and characteristics.

			N (%); mean \pm SD
Gender	All pituitary diseases	Men	84 (36.2)
		Women	148 (63.8)
	Pituitary adenoma*	Men	67 (43)
		Women	89 (57)
Age at registration, years	All		38.2 \pm 15.3
	Macroadenoma		42.5 \pm 14.9
	Microadenoma		34.8 \pm 14.7
Macroadenoma**	Men		51 (50.5)
	Women		50 (49.5)
Died			4

*Of 156 pituitary adenoma

**Of 101 macroadenoma

Table 2. Spectrum of sellar and parasellar region lesions.

		N (%)
Pituitary adenoma		156 (67.2)
Growth hormone secreting adenoma (acromegaly)		64 (41.0)
Clinically non-functioning pituitary adenoma (NFPA)		49 (31.4)
Prolactinoma*		42 (26.9)
GH-secreting adenoma with hyperprolactinemia*		5
ACTH- secreting pituitary adenoma		2 (1.2)
Hypopituitarism		57 (24.5)
Empty sella syndrome	All	22 (9.4)
	Primary**	9
	Secondary	13
Diabetes insipidus		15
Apoplexy		3
Hyperprolactinemia	All	51
	No adenoma	12
Pituitary enlargement		3
Stalk lesions		1
Miscellaneous		11
Craniopharyngioma		9 (3.9)
Sheehan syndrome		9 (3.9)
Meningioma		4 (1.7)
Rathke's cleft cyst		3
Total		232

*GH-secreting adenoma, 2 of them stain on biopsy for lactotroph cell

**Acromegaly in 4

Table 3. Pituitary adenoma according to the size.

	Microadenoma N (%)	Macroadenoma N (%)	Total
Pituitary adenoma	55 (35.2)	101 (64.8)	156
Growth hormone secreting adenoma (acromegaly)	17 (26.5)	47 (73.4)	64
Clinically non-functioning pituitary adenoma (NFPA)	19 (38.8)	30 (61.2)	49
Prolactinoma	16 (38)	26 (62.0)*	42
ACTH- secreting Pituitary adenoma	2 (100.0)	0	2

*Of them six giant Prolactinoma

Table 4. Type of treatment for pituitary adenoma.

		N (%)
Hypophysectomy-transsphenoidal		33 (21.1)
Hypophysectomy-transcranial		8 (5.1)
Hypophysectomy-transsphenoidal followed by transcranial or reverse or repeat same surgery, i.e., twice surgery		4 (2.5)
Stereotactic radiosurgery		5 (3.2)
Radiotherapy		1 (0.6)
Primary medical treatment	Growth hormone secreting adenoma (acromegaly)	46 (71.4)*
	Prolactinoma	32 (76.1)**
Total		156

*Of patients with acromegaly

**Of patients with prolactinoma

Dataset 1. Description of patients included in the study<http://dx.doi.org/10.5256/f1000research.13632.d197439>**Discussion**

All pituitary disease and adenoma were more common among women in this study. The gender predominance among patients with pituitary adenoma is variable in the literature depending on hormone secretion and age of the patients, the size of the tumor and female dominance is not clear^{15,16}. However, female dominance has been seen in Saudi Arabia¹⁷ and one series from Argentina¹⁸. Those with macroadenoma tend to be older in age with no difference in the prevalence between men or women.

Seen in about two-thirds of patients, pituitary adenoma constituted the main bulk of pituitary disease in this study, which is compatible with reports in the literature¹⁶.

The commonest pituitary adenoma was growth hormone secreting adenoma (acromegaly), followed by NFPA and prolactinoma. This is entirely different from the literature on the prevalence of pituitary adenoma^{2,16,17,19}. This could be attributed to selection bias because only growth hormone secreting adenoma (acromegaly) patients are being referred, while NFPA and prolactinoma were treated by different specialties, such as neurosurgeons or gynecologists, without referral to a specialized Center like FDEMC. In Basrah, most cases of hyperprolactinemia were seen by a gynecologist because of amenorrhea and infertility, and the neurosurgeon follows patients with NFPA without referring them.

Hypopituitarism is prevalent in a quarter of this pituitary centre, from different causes, ranging from macroadenoma to hypophysectomy. Evaluation for hypopituitarism remains an integral part of the workup for any pituitary lesions because missing such diagnosis could be catastrophic^{9,13}. This figure is far higher than that of Saudi Arabia, which was 1.2%¹⁷.

Empty sella syndrome was seen in 9.4% of patients in this study, which can be primary or secondary to surgery or apoplexy. Empty sella syndrome needs an extensive workup to assess pituitary function²⁰.

Craniopharyngioma and Sheehan syndrome are two diseases with a different spectrum of age distribution, but they were seen at the same frequency in this cohort. Craniopharyngioma is a disease of childhood and adolescence²¹. Sheehan syndrome is supposed to be rare in developed countries, but is still seen in developing countries²².

Less than two thirds of adenoma in this study were macroadenomas. While in most series macroadenomas constitute 50% of the pituitary adenomas²; however in Canada, a similar finding has been seen compared with this study²³. Again this could be explained by referral bias in this study. In Saudi Arabia, microadenomas were more prevalent¹⁷.

For growth hormone secreting adenoma (acromegaly), more than two thirds were macroadenomas, which is established fact for all acromegaly^{2,24,25}.

NFPA was a macroadenoma and seen at around 60% in this study. A similar finding was seen in a previous series².

Prolactinomas were macroadenoma in around 60% of cases in this study. This differs from the literature, where more than 90% of prolactinomas were microadenomas^{2,18}.

Hypophysectomy-transsphenoidal as surgical treatment was done in one third of pituitary adenomas, while transcranial approach or stereotactic radiosurgery was contemplated in the minority. This is a typical approach for most of the pituitary adenomas^{2,26}. For growth hormone secreting adenoma (acromegaly), the primary treatment in this study was medical treatment in about two thirds of individuals. This is contrary to literature where surgery is the main mode of therapy²⁶. The explanation is that we are just building a new neurosurgery unit for pituitary glands over the last few years, and in the future, surgery of pituitary is supposed to improve, and early referral will be the best.

For prolactinoma, primary medical treatment was done in two thirds of patients, while it should be the main treatment of choice in more than 90%, as seen in previous literature²⁶.

Malignant disease metastasizing to the pituitary is not observed in this study because they are not referred from Oncology Center in Basrah.

Study limitation

This study supposes to involve most of the pituitary disease patients in Basrah because the Center is a tertiary referral center. However, due to referral bias among some neurosurgeons and gynecologists, we cannot guarantee that the data includes all patients with this condition in Basrah.

Conclusion

Pituitary adenomas constituted the bulk of pituitary disease in patients treated at the FDEMC, Basrah. Growth hormone secreting adenoma (acromegaly) is the most frequent adenoma followed by NFPA and prolactinoma due to referral bias. A change in the practice of adenoma treatment is needed.

Data availability

Dataset 1: Description of patients included in the study
10.5256/f1000research.13632.d197439²⁷

Competing interests

No competing interests were disclosed.

Grant information

The author(s) declared that no grants were involved in supporting this work.

Acknowledgments

All authors are thankful to the medical staff of FDEMC for their contribution and support.

References

1. Glezer A, Bronstein MD: **Pituitary apoplexy: pathophysiology, diagnosis and management.** *Arch Endocrinol Metab.* 2015; **59**(3): 259–64.
[PubMed Abstract](#) | [Publisher Full Text](#)
2. Molitch ME: **Diagnosis and Treatment of Pituitary Adenomas: A Review.** *Jama.* 2017; **317**(5): 516–24.
[PubMed Abstract](#) | [Publisher Full Text](#)
3. Larson A, Nokoff NJ, Meeks NJ, *et al.*: **Genetic causes of pituitary hormone deficiencies.** *Discov Med.* 2015; **19**(104): 175–83.
[PubMed Abstract](#)
4. Messerer M, Dubourg J, Raverot G, *et al.*: **Non-functioning pituitary macro-incidentomas benefit from early surgery before becoming symptomatic.** *Clin Neurol Neurosurg.* 2013; **115**(12): 2514–20.
[PubMed Abstract](#) | [Publisher Full Text](#)
5. Mehta GU, Lonser RR: **Management of hormone-secreting pituitary adenomas.** *Neuro Oncol.* 2017; **19**(6): 762–73.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
6. Chatzellis E, Alexandraki KI, Androulakis II, *et al.*: **Aggressive pituitary tumors.** *Neuroendocrinology.* 2015; **101**(2): 87–104.
[PubMed Abstract](#) | [Publisher Full Text](#)
7. Narendra BS, Dharmalingam M, Kalra P: **Acromegaly Associated with Pituitary Incidentaloma.** *J Assoc Physicians India.* 2015; **63**(6): 79–82.
[PubMed Abstract](#)
8. Dai C, Feng M, Liu X, *et al.*: **Refractory pituitary adenoma: a novel classification for pituitary tumors.** *Oncotarget.* 2016; **7**(50): 83657–68.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
9. Higham CE, Johannsson G, Shalet SM: **Hypopituitarism.** *Lancet.* 2016; **388**(10058): 2403–15.
[PubMed Abstract](#) | [Publisher Full Text](#)
10. Fabian UA, Charles-Davies MA, Fasanmade AA, *et al.*: **Male Sexual Dysfunction, Leptin, Pituitary and Gonadal Hormones in Nigerian Males with Metabolic Syndrome and Type 2 Diabetes Mellitus.** *J Reprod Fertil.* 2016; **17**(1): 17–25.
[PubMed Abstract](#) | [Free Full Text](#)
11. McLaughlin N, Laws ER, Oyesiku NM, *et al.*: **Pituitary centers of excellence.** *Neurosurgery.* 2012; **71**(5): 916–24; discussion 24–6.
[PubMed Abstract](#) | [Publisher Full Text](#)
12. Chanson P, Raverot G, Castinetti F, *et al.*: **Management of clinically non-functioning pituitary adenoma.** *Ann Endocrinol (Paris).* 2015; **76**(3): 239–47.
[PubMed Abstract](#) | [Publisher Full Text](#)
13. Kim SY: **Diagnosis and Treatment of Hypopituitarism.** *Endocrinol Metab (Seoul).* 2015; **30**(4): 443–55.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
14. Spaziante R, Zona G, Testa V: **Primary empty sella syndrome.** *Surg Neurol.* 2003; **60**(2): 177–8; author reply 178.
[PubMed Abstract](#) | [Publisher Full Text](#)
15. McDowell BD, Wallace RB, Carnahan RM, *et al.*: **Demographic differences in incidence for pituitary adenoma.** *Pituitary.* 2011; **14**(1): 23–30.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
16. Drange MR, Fram NR, Herman-Bonert V, *et al.*: **Pituitary tumor registry: a novel clinical resource.** *J Clin Endocrinol Metab.* 2000; **85**(1): 168–74.
[PubMed Abstract](#) | [Publisher Full Text](#)
17. Aljabri KS, Bokhari SA, Assiri FY, *et al.*: **The epidemiology of pituitary adenomas in a community-based hospital: a retrospective single center study in Saudi Arabia.** *Ann Saudi Med.* 2016; **36**(5): 341–5.
[PubMed Abstract](#) | [Publisher Full Text](#)
18. Day PF, Loto MG, Glerean M, *et al.*: **Incidence and prevalence of clinically relevant pituitary adenomas: retrospective cohort study in a Health Management Organization in Buenos Aires, Argentina.** *Arch Endocrinol Metab.* 2016; **60**(6): 554–61.
[PubMed Abstract](#) | [Publisher Full Text](#)
19. Lake MG, Krook LS, Cruz SV: **Pituitary adenomas: an overview.** *Am Fam Physician.* 2013; **88**(5): 319–27.
[PubMed Abstract](#)
20. Ghatnatti V, Sarma D, Saikia U: **Empty sella syndrome - beyond being an incidental finding.** *Indian J Endocrinol Metab.* 2012; **16**(Suppl 2): S321–3.
[PubMed Abstract](#) | [Free Full Text](#)
21. Müller HL: **Craniopharyngioma.** *Handb Clin Neurol.* 2014; **124**: 235–53.
[PubMed Abstract](#) | [Publisher Full Text](#)
22. Karaca Z, Laway BA, Dokmetas HS, *et al.*: **Sheehan syndrome.** *Nat Rev Dis Primers.* 2016; **2**: 16092.
[PubMed Abstract](#) | [Publisher Full Text](#)
23. Imran SA, Yip CE, Papneja N, *et al.*: **Analysis and natural history of pituitary incidentalomas.** *Eur J Endocrinol.* 2016; **175**(1): 1–9.
[PubMed Abstract](#) | [Publisher Full Text](#)
24. Lavrentaki A, Paluzzi A, Wass JA, *et al.*: **Epidemiology of acromegaly: review of population studies.** *Pituitary.* 2017; **20**(1): 4–9.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
25. Portocarrero-Ortiz LA, Vergara-Lopez A, Vidrio-Velazquez M, *et al.*: **The Mexican Acromegaly Registry: Clinical and Biochemical Characteristics at Diagnosis and Therapeutic Outcomes.** *J Clin Endocrinol Metab.* 2016; **101**(11): 3997–4004.
[PubMed Abstract](#) | [Publisher Full Text](#)
26. Al-Dahmani K, Mohammad S, Imran F, *et al.*: **Sellar Masses: An Epidemiological Study.** *Can J Neurol Sci.* 2016; **43**(2): 291–7.
[PubMed Abstract](#) | [Publisher Full Text](#)
27. Mansour AA, Alhamza AH, Almomin AM, *et al.*: **Dataset 1 in: Spectrum of Sellar and Parasellar Region Lesions: A retrospective study from Basrah, Iraq.** *F1000Research.* 2018.
[Data Source](#)

The benefits of publishing with F1000Research:

- Your article is published within days, with no editorial bias
- You can publish traditional articles, null/negative results, case reports, data notes and more
- The peer review process is transparent and collaborative
- Your article is indexed in PubMed after passing peer review
- Dedicated customer support at every stage

For pre-submission enquiries, contact research@f1000.com

F1000Research