

# Pattern of Pituitary Lesions at the Endocrine Center of a Tertiary Care Hospital

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## Abstract

**Objective:** To study the frequency, demographic features, clinical presentation, radiological findings and treatment of patients with pituitary lesions, registered at the Endocrine Unit.

**Study type, settings and duration:** A retrospective study was carried out at the Endocrine Unit of Jinnah Postgraduate Medical Centre, Karachi, from 2007 to 2014.

**Methodology:** The retrospective analysis of case records of patients registered at tertiary care hospital, with different pituitary lesions was done. All the cases with definitive pituitary etiology were included in the analysis. Data was recorded in a pre-designed structured proforma. The frequency, demographic features, clinical presentation, radiological findings and treatment of patients with pituitary lesions were studied.

**Results:** A total of 97 patients were diagnosed to have a definitive endocrine disorder related to the pituitary gland, of these 65 (67%) were female and 32 (33%) were male. The mean age was  $32 \pm 11.5$  years. The pattern of pituitary lesions was Prolactinoma in 26 (26.8%) patients, followed by Sheehan's syndrome in 13 (13.4%); Acromegaly in 12 (12.4%); non-secretory pituitary adenoma in 11 (11.3%); Hypogonadotropic hypogonadism in 10 (10.3%) and Craniopharyngioma in 7 (7.2%) patients. Our study reported that pituitary lesions frequently affected female patients. Pituitary MRI showed pituitary tumor in 61 (62.9%) patients, of which macroadenoma was reported in 45 (73.7%) patients while microadenoma in 19 (31.1%) patients. Commonest clinical symptom was headache reported in 58 (59.7%) patients.

**Conclusion:** Pituitary lesions frequently affected females, commonest being Prolactinomas. A high index of suspicion is required to appropriately evaluate the protean clinical symptoms of pituitary related disorders.

**Key words:** Pituitary, prolactinoma, acromegaly, sheehan's syndrome.

## Introduction

The incidence of pituitary lesions vary widely across the globe. Existing data regarding the exact prevalence of pituitary disorders are discordant. It has been reported that pituitary tumors account for 10-15% of all primary brain tumours.<sup>1,2</sup> A study from United Kingdom, reported an incidence of 77.6 cases of pituitary adenoma per 100,000 population.<sup>3</sup> Pituitary disorders present with varied

clinical manifestations, which could be attributed to hormone over-production, under-secretion or compression symptoms due to space occupying effect. However, a wide range of lesions may remain asymptomatic. A study from Germany reported a prevalence of 10.4% of sub-clinical pituitary tumors on the immune-histochemistry of pituitary glands, from autopsy specimens.<sup>4</sup>

With advancement in neuro-imaging modalities, the incidence rate for pituitary disorders is rising, as more lesions have been identified and reported via the use of recent advance radiological techniques. Overall majority of pituitary lesions are pituitary prolactinoma. Sparse documentation is available to reflect the estimates of the prevalence of pituitary diseases from Pakistan. One study reported a prevalence of 9% of pituitary lesion on analysis of pituitary MRI.<sup>5</sup> The clinical presentation and etiology of pituitary disorders vary across different populations, and there is paucity of data to document the clinical, pathological and hormonal profile in the context of pituitary diseases from

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### Authors Contribution

RJ, TA, UE & ULR conceptualized the project & did the literature search, statistical analysis, drafting, revision & writing of manuscript. Data collection was done by TA, UE & ULR.

South-Asian region. The present study was designed to ascertain the frequency and etiology of pituitary lesions, as seen in an Endocrine unit of a tertiary care public sector hospital. The aim is to provide clues for the diagnosis of pituitary disorders and to emphasize on prompt and early recognition of pituitary diseases for optimal clinical care and better long term outcomes in these patients.

## Methodology

The Retrospective analysis of the 07 years data (2007 to 2014), of patients suffering from different pituitary lesions, at the Endocrine unit of Jinnah Postgraduate Medical Centre, Karachi was done.

Case records of the patients with definitive pituitary etiology were included in the study. Whereas, patients with incomplete data and erratic follow-up visits were excluded.

Data regarding demographic variables, clinical presentation, medical history, physical examination, laboratory and radiological investigations and treatment regimens were recorded in a pre-designed structured proforma. Data was analyzed using SPSS version 17. For descriptive variables like gender, frequency of pituitary lesions, laboratory and radiological findings, clinical presentation and treatment regimens, frequency with percentages were calculated, while for age means with standard deviation were calculated.

## Results

During study period total 97 patients were diagnosed to have a definitive endocrine disorder related to the pituitary gland. Of the 97 patients, 65 (67.0%) were female and 32 (33.0%) were male. The mean age was  $32.0 \pm 11.5$  years and the median duration of symptoms was 4.2 years (Table-1).

**Table 1 Demographic features.**

|                                 |                 |
|---------------------------------|-----------------|
| Males                           | 32 (33.0%)      |
| Females                         | 67 (67.0%)      |
| Mean Age (years)                | $32.0 \pm 11.5$ |
| Median Symptom duration (years) | 4.2             |

The commonest pituitary lesion was Prolactinoma in 26 (26.8%) patients, followed by Sheehan's syndrome in 13 (13.4%) patients, Acromegaly in 12 (12.4%), non-secretory pituitary adenoma in 12 (12.3%), Hypogonadotropic hypogonadism in 10 (10.3%) and Craniopharyngioma in 7 (7.2%) patients, while miscellaneous disorders

including Pan hypopituitarism, Cushing's disease, Empty sella syndrome, Ectopic Cushing's, Diabetes Insipidus, Autoimmune hypophysitis, TSHoma and Suprasellar mass etc. contributed 1.0 - 4.1% individually (Figure-1).

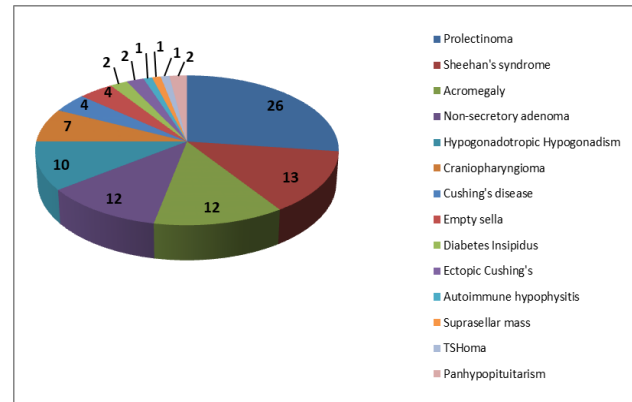


**Figure 1: Pattern of pituitary lesions at a tertiary care endocrine center.**

Of the patients with Prolactinoma, 19 (19.5%) were female and 7 (7.2%) were male. Acromegaly was equally distributed in both genders, Craniopharyngioma was predominant in male patients. While other lesions frequently affected female patients (Table-2).

**Table 2: Gender distribution among different pituitary lesions.**

| Diagnosis                     | Gender   |            |
|-------------------------------|----------|------------|
|                               | Male (n) | Female (n) |
| Prolactinoma                  | 7        | 19         |
| Acromegaly                    | 6        | 6          |
| Sheehan's syndrome            | 0        | 13         |
| Non-secretory adenoma         | 4        | 8          |
| Hypogonadotropic hypogonadism | 4        | 6          |
| Craniopharyngioma             | 6        | 1          |
| Cushing's disease             | 1        | 3          |
| Empty sella                   | 1        | 3          |
| Miscellaneous                 | 3        | 6          |

Pituitary imaging (MRI) showed pituitary tumor in 61 (62.9%) patients, normal pituitary in 9 (9.3%) patients, Empty sella in 4 (4.1%) patients, diffuse enlargement of pituitary in 2 (2.1%) and asymmetry of pituitary in 1 (1.03%) patient. Of the 61 patients with pituitary tumor on MRI, 45 (73.7%) had macro-adenoma (tumor size  $>1\text{cm}$ ) and 19 (31.1%) had micro-adenoma (tumor size  $<1\text{cm}$ ) (Figure-2).

Commonest clinical symptom was headache reported in 58 (59.7%) patients, visual impairment in 30 (30.9%), infertility in 21 (21.6%)

patients, whereas, primary infertility in 10 patients and secondary infertility in 21 patients were observed, galactorrhea in 12 (12.3%), increased acral growth in 11 (11.3%), decreased libido in 10 (10.3%) and anosmia in 6 (6.1%) patients. Many patients had more than one clinical symptom simultaneously. (Figure-3)

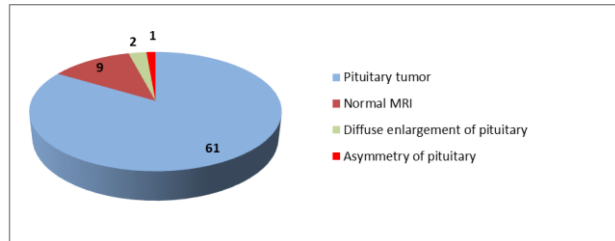


**Figure 2: MRI findings among patients with pituitary lesions at a tertiary care endocrine center.**

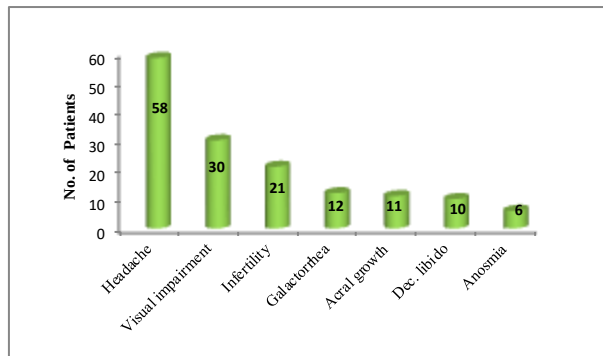


**Figure 3: Clinical features of patients with pituitary lesions.**

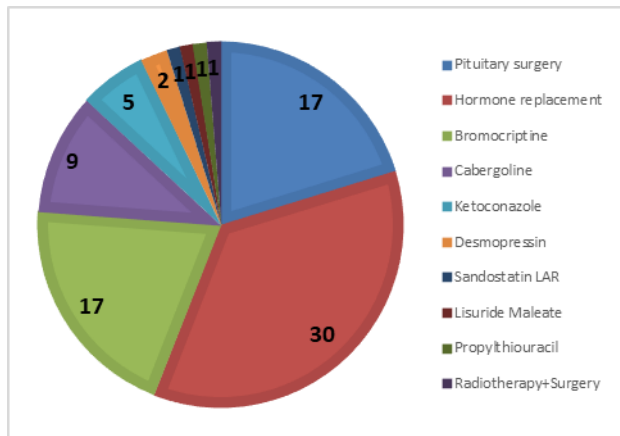


**Figure 4: Treatment regimen of patients with pituitary disorders.**

Of those with tumor, 17 (17.5%) patients underwent pituitary surgery and one of them received additional radiotherapy. Hormone replacement

therapy was required in 30 (30.9%) patients. Bromocriptine was prescribed in 17 (17.5%) patients, of these 15 had Prolactinoma; 1 patient had Acromegaly and 1 had Empty sella with hyperprolactinemia. While 9 (9.2%) patients with Prolactinoma were given Cabergoline and 1 (1.0%) received Lisuride Maleate. One patient of prolactinoma had auto-infarction of the tumour and his prolactin level normalized without any treatment. Ketoconazole was prescribed to 5 (5.1%) patients (3 Cushing's disease and 2 Ectopic Cushing's); Desmopressin, Propylthiouracil, and Sandostatin LAR were given to 1.0-3.1% patients individually (Figure-4).

## Discussion

This study is a sizeable cohort of patients with pituitary lesions. Majority of the patients were female, as reported earlier, even though a few studies have also reported high frequency of pituitary lesions in male patients, most of them presenting with mass effects rather than hormonal abnormalities.<sup>6-8</sup> In our study, Acromegaly equally affected both genders, while craniopharyngioma was reportedly higher in male patients, however, rest of the pituitary lesions pre-dominantly affected female patients. Commonest disorder reported in our study was Prolactinoma, with more patients being affected with macroadenoma. This finding is consistent with the study reported by Sarwar et al. where macroprolactinoma was the dominant lesion.<sup>10</sup> It is important to differentiate between non-function pituitary adenomas with hyperprolactinemia due to stalk effect and true macroprolactinoma. In this case it is important to correlate the tumor size with prolactin (PRL) level, as the larger the size of prolactinoma the higher will be the PRL level.<sup>9</sup>

Sheehan's syndrome constitutes a significant group in this cohort, reflecting inadequate peri-partum care for a multitude of reasons. This is in contrast with other studies that reported tumors as the leading cause of pan hypopituitarism. A small study from India reported a frequency of 84% pituitary tumors in patients with panhypopituitarism.<sup>11</sup> Another study, from United Kingdom, also reported non-functioning pituitary tumor and craniopharyngioma, as the leading cause for hypopituitarism.<sup>12</sup> The reason to seek medical care was symptoms related to mass effect, rather than hormonal dysfunction per se, in patients with Craniopharyngioma in our study. Only 02 patients were diagnosed with lesions involving the pituitary infundibulum in this study, as it is a diagnostic challenge to consider inflammatory, infective or autoimmune disorders affecting the pituitary infundibulum, as biopsy of this region

requires special skills and is fraught with the possibility of inducing fresh hormone failure. Moreover, a lesion in this location can cause protean manifestations despite its small size.<sup>13-15</sup> Therefore, autoimmune pituitary hypophysitis should always be considered in the work-up and differential diagnosis of non-functioning lesions involving the pituitary gland.<sup>13-15</sup> Moreover, other inflammatory/infectious disorders of pituitary gland as well as rare tumors like Germinoma also pose diagnostic dilemma, which can only be definitely diagnosed through transphenoidal biopsy of pituitary gland. TSHoma is a very rare pituitary tumor, which presents with features of hyperthyroidism with neurological symptoms or other concomitant pituitary hormone dysregulation and an elevated TSH.<sup>16</sup> Very few cases of TSHoma have been reported so far.<sup>17-18</sup> None has been reported from Pakistan to the best of our knowledge. Hormone dysregulation is seen in most patients with empty sella, however, one patient in our study had normal function. Very rarely hormone excess occurs due to co-existing adenoma within the compressed pituitary gland. An Indian study reported hyperprolactinemia as the commonest hormonal dysfunction in their patients with primary empty sella.<sup>19</sup> While in this case series hypogonadotropic hypogonadism, diabetes insipidus, prolactinoma and normal pituitary hormones were seen in patients with empty sella.

The commonest clinical symptom was headache in this study, which is consistent with other studies as well.<sup>5,10</sup> It has been suggested that Prolactinomas and growth hormone secreting adenomas have a higher prevalence of headache due to biochemical changes in the hypothalamic-pituitary axis.<sup>20</sup> Patients with compressive symptoms and signs underwent pituitary surgery. For Prolactinomas medical treatment in the form of Bromocriptine was the first line drug used, as it was the cost effective option for low income patients seen in a public sector hospital.<sup>21</sup> Hormonal replacement was given to patients where deficiency existed and in post-operative patients. GH deficiency was not treated in adults due to the prohibitive cost.

Pituitary tumors are mostly sporadic in origin, but familial cases have been reported as well. Thus, it has been postulated that some form of genetic predisposition, endocrine hormonal factors or somatic mutations may play a pathogenic role in the development of pituitary tumours.<sup>22,23</sup> Whether or not, this applied to some of the patients is too early to predict, as ethnic variation between the incidence and prevalence of these disorders is also likely due to variation in health care facilities and

advancement of diagnostic modalities at some centers.

To best of our knowledge, the study represents a first study to collate the estimates of diseases affecting the pituitary gland as seen in a tertiary care set-up. Most of the patients, in this study, with pituitary tumors or even otherwise were diagnosed late in the course of their disease due to polymorphic symptoms. Hence, a prompt, early diagnosis of pituitary disorders is crucial to initiate timely appropriate treatment to halt disease progression and its associated morbidities. Increased awareness in medical professionals will go a long way in mitigating the morbidity associated with pituitary disorders.

**Conflict of interest:** None declared.

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