

## The Frequency of Occurrence of the Macro and Giant Pituitary Adenomas in Tashkent by Retrospective Data of the Appeal

MB Mirtukhtaeva<sup>1</sup>, N Leekha<sup>2</sup>, M Nandy<sup>3</sup>, JM Ibragimov<sup>4</sup>, AM Akbutaev<sup>5</sup> and YuM Urmanova<sup>6\*</sup>

<sup>1</sup>Postgraduate Student, Department Of Neuroendocrinology (RSSPMCE), Republican Specialized Scientific Practical Medical Center of Endocrinology Named by Yo. Kh. Turakulov Ministry of Health of the Republic of Uzbekistan, Uzbekistan

<sup>2</sup>Associate Director, Surgical Oncology, Jaypee Hospital, Noida, Uttar Pradesh, India

<sup>3</sup>Director Medical Oncology, Chemotherapy Department, Jaypee Hospital, Noida, Uttar Pradesh, India

<sup>4</sup>Chemotherapy Department, Center of Nuclear Medicine "New Life Medical", Tashkent, Uzbekistan

<sup>5</sup>PhD in Endocrinology, Department of Neurosurgery, Neurosurgeon, RSSPMCE, Uzbekistan

<sup>6</sup>Professor of the Department of Tashkent Pediatric Medical Institute, Endocrinology Department, DSc in Endocrinology, Uzbekistan

\*Corresponding Author: YuM Urmanova, Professor of the Department of Tashkent Pediatric Medical Institute, Endocrinology Department, DSc in Endocrinology, Uzbekistan.

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### Abstract

**The Aim of Investigation:** To study the prevalence and perform the comparative characteristic of neuroendocrine disorders in patients with macro and giant pituitary adenomas...

**The Material and Methods:** We studied data from 3 Centers in Tashkent (RSSPMC Endocrinology of PHM named by akad. Yo.Kh. Turakulov, Scientific Center for Neurosurgery and Scientific Center for Emergency Medical Aid of the Ministry of Health of the Republic of Uzbekistan), according to which 156 patients with giant pituitary adenomas of various etiologies were hospitalized for last 3 years (period 2015-2020). (of which men - 76, women -80). Average age: men amounted to 37.12 years, women - 38, 15 years. The duration of the disease ranged from 2 months to 25 years.

**Result and Discussion:** Depending on the size of the adenoma of the pituitary, detected on CT/MRI, the patients were distributed into two groups: 1 group of patients - macroadenomas (from 20 to 30 mm) - 70 (44.8%), and 2 group of patients - giant pituitary adenomas - (more 30 mm) - 86 (55.1%) cases.

The comparative characteristics of the groups showed that the most pronounced neuroendocrine and ophthalmological disorders were found in patients with 2 groups with giant adenomas of the pituitary gland. Thus, neuroendocrine (growth hormone deficiency, panhypopituitarism, hypopituitarism, infertility, secondary amenorrhea), ophthalmic (BG, amaurosis, etc.) and stem disorders (pyramidal symptoms, the decrease in reflexes and muscle tone diffuse) were observed in patients with a total growth option for giant adenomas. In patients with giant adenomas of the pituitary gland, first of all there is a decrease in the level of STH, FSH, LH, ACTH (55%), that is, panhypopituitarism against the background of general-selling and stem symptoms.

It should be emphasized that, in general, patients had the decrease in the average values of trop hormones of pituitary glands, but most reliably and often in patients with giant adenomas of the pituitary gland.

**Conclusions:** In all patients with giant pituitary adenomas to one degree or another, neuroendocrine disorders are marked, aggravating the pituitary tumor growth. The nature of the disorders has a number of specific (BG, cattle, hypopituitarism, the defeat of the brain-brain nerves) and non-specific symptoms (pyramidal symptoms, diffuse reduction of muscle tone, reflexes), depending on the side of growth, tumor sizes. The most pronounced neuroendocrine (GHD, panhypopituitarism hypopituitarism, infertility, secondary amenorrhea), ophthalmic (BG, Amaurosis, etc.) and stem violations (pyramidal symptoms, reducing reflexes and muscle tone diffuse) were observed in patients with a total growth option.

**Keywords:** Giant Pituitary Adenomas; Clinic; Complications

## Introduction

Among the pituitary tumors, adenoma occupy the first place. They are usually found in adults, but sometimes found in childhood [1-3]. In general, the pituitary tumors are often found in some cases a rather severe type of neuroendocrine pathology [4,5]. In the literature there is not much work on this topic [6-12].

Endocrine disorders belong to the earliest manifestations of the disease. In women, this is manifested by the disorder of the menstrual cycle in the form of dismenorrhea or amenorrhea, lactorrhoea, and accordingly, infertility [6]. Then join the symptoms of disorders of visual fields, pyramidal symptoms, neuroendocrine disorders- all is depending on the type of adenoma. In men, a similar sequence of endocrine disorders, among the first marks sexual weakness (Patsko Ya.V., 1989).

At the same time, few works dedicated to the peculiarities of the macro and giant pituitary adenomas.

All of the above served as a reason for this study.

The aim of investigation to study the prevalence and perform the comparative characteristic of neuroendocrine disorders in patients with macro and giant pituitary adenomas.

## The Material and Methods

We studied data from 3 Centers in Tashkent (RSSPMC Endocrinology of PHM named by akad. Yo.Kh. Turakulov, Scientific Center for Neurosurgery and Scientific Center for Emergency Medical Aid of the Ministry of Health of the Republic of Uzbekistan), according to which 156 patients with giant pituitary adenomas of various eti-

ologies were hospitalized for last 3 years (period 2017-2020). (of which men - 76, women -80). Average age: men amounted to 37.12 years, women - 38, 15 years. The duration of the disease ranged from 2 months to 25 years.

In our study, we relied on the classification of Kurokawa Y., (1998), which considers tumors to be more than 30 mm and 40 mm, respectively, as gigantic.

A total of 137 (87,8%) TPAs (transnasal pituitary adenomec-tomy) were performed in three Centers in Tashkent (Prof. Phay-zullaev R.B., PhD. Akbutaev A.M., Prof. K. Makhkamov, and Prof. Michael Powell from the UK,London). Repeated operations on the pituitary gland were performed in 5 patients (7.3%). Radiation therapy was received by 5 (7.4%) patients and 1 chemotherapy (1.5%).

Research methods included: 1) general clinical (examination of endocrine, neurological status), 2) instrumental (perimetry for all colors, eyes fundus, 3) ECG, CT/MRI of the Turkish saddle and adrenal glands, 4) ultrasound investigation of internal and genital organs, etc.), 5) hormonal blood tests (STH, IGF-1, LH, FSH, TSH, ACTH, prolactin, testosterone, estradiol, progesterone, cortisol level (RIA and Chemilyuminiscent studies of blood serum were performed on Gamma counters -12 "and" Strantg 300 "). In addition, the postoperative material was subjected to histological diagnosis in RSSPMC Endocrinology Center MPH RUz named by academic Yo. Kh.Turakulov (histology office).

Statistical calculations were performed in the Microsoft Windows software environment using the Microsoft Excel-2007 and Statistical version 6.0, 2003 software packages. The data obtained

are reflected in the dissertation in the form  $M \pm m$ , where  $M$  is the average value of the variation series,  $m$  is the standard error of the average value. The significance of differences between independent samples was determined by the Mann-Whitney and Student methods.

Repeated operations on the pituitary gland were performed with 8 patients (5.1%) of both groups. Radiation therapy received 6 (3.8%) patients and 1 - chemotherapy.

**Results**

Table 1 shows the distribution of patients by gender and age.

Age, years	The number of men		The number of women	
	1 gr	2 gr	1 gr	2 gr
13-15 years	-	-	1	1
16-29	8	14	10	11
30-44	6	18	13	10
45-59	6	15	12	11
60-74	3	5	4	9
75 and more	-	-	1	2
Total : n = 156	24	52	41	39

**Table 1:** Distribution of patients by gender and age.

Depending on the size of the adenoma of the pituitary, detected on CT/MRI, the patients were distributed into two groups: 1 group of patients - macroadenomas (from 20 to 30 mm) - 70 (44.8%), and 2 group of patients - giant pituitary adenomas - (more 30 mm) - 86 (55.1%) cases.

As can be seen from table 1, patients prevailed aged 16 to 29 years old, from 30-04 years and from 45-59 years old, that is, the most able-bodied age.

It was revealed that in the 2 group of patients most often met panhypopituitarism - in 40 of 86 patients (46.5%), postoperative panhypopituitarism met - in 69 of 86 patients (80.2%), but in the 1st group of panhypopituitarism no was found. Biemporale hemianopsy also with a larger frequency was observed in patients with 2 groups - 52 cases (60.4%). In addition, the secondary amenorrhea has also encountered patients with 2 groups - 33 (38.7%). Such disorders like secondary osteopeniya, endocrine encephalopathy,

the delay in physical and sexual development was identified only in the 2 group of patients. Thus, the most pronounced neuroendocrine and ophthalmologic disorders were found in patients of second group.

The most pronounced disorders of neurological status - endocrine encephalopathy, hallucinations (1 case, 1.1%), inadequate state (1 case, 1.1%), amavrosis (9, 10.4%), ischemic stroke (2 cases, 2.2%), pathological reflexes, decrease of muscle tone - we established in patients of 2 group during because of germination of the tumor in the brain departments - anterior, middle or rear skull, with a tumor growth in brain ventricles and both cavernous sinus.

The most pronounced violations of the fields in the form of a biphymporal gemianopsy (BG) were observed in patients with both groups with endo-supramellar growth - 18 cases (14.8%), with a total growth option - 36 cases (30%), with endo-supralacllar growth - 28 cases (23%) and supra-laateroseclalar growth - 28 cases (23%)

Such complications like hemorrhage into a tumor in 6 (6.9%), the recurrence of tumor growth in 14 (16.2%) was found only in 2 patients.

The most reliable decrease in the average values of the basal levels of plasma trop hormones - STH, LH, FSH, ACTH was recorded in patients 2 groups ( $p < 0.05$ ) (Table 2,3).

Hor-mones	The average value	P	Control	Norm
LH	1,58 ± 0,4	<0,01	12,3 ± 2,1	8,7 ME/L (6,0-12,0)
FSH	6,5 ± 0,3	>0,05	8,2 ± 0,3	6,1 ME/L (1,0-8,0)
Prolactin	17,3 ± 0,6	<0,05	5,3 ± 0,5	5,7 ng/ml
ACTH	42,5 ± 3,5	>0,05	44,3 ± 9,3	until 50 pg/ml
IGF-1	523, 6 ± 7,4	>0,05	564,1 ± 23,1	134-836 ng/ml
STH	0,77 ± 0,01	<0,05	3,1 ± 0,4	2-5 ng/ml
Free thyroxin	122,6 ± 10,1	>0,05	112,9 ± 13,6	60-160 nmol/l
Cortisol	643,3 ± 12,6	>0,05	673,9 ± 24,6	In the morning 260-720 nmol/l

**Table 2:** The average value of the hormones of the plasma in patients 1<sup>th</sup> group (n = 70).

Hormones	The average value	P	Control	Norm
LH	0,29 ± 0,03	<0,01	12,3 ± 2,1	8,7 ME/L (6,0-12,0)
FSH	2,75 ± 0,4	<0,05	8,2 ± 0,3	6,1 ME/L (1,0-8,0)
Prolactin	11,18 ± 0,7	<0,05	5,3 ± 0,5	5,7 ng/ml
ACTH	35,7 ± 7,9	>0,5	44,3 ± 9,3	until 50 pg/ml
IGF-1	45,3 ± 12,3	<0,05	564,1 ± 23,1	134-836 ng/ml
STH	0,68 ± 0,01	<0,05	3,1 ± 0,4	2-5 ng/ml
Free thyroxin	102,6 ± 16,3	>0,5	112,9 ± 13,6	60-160 nmol/l
Cortisol	190,2 ± 22,1	<0,5	673,9 ± 24,6	In the morning 260-720 nmol/l

**Table 3:** The average value of the hormones of the plasma in patients 2<sup>th</sup> group (n = 85).

In addition, these patients also reliably reduced levels of cortisol, while patients with 1 group of plasma cortisol was on average within the normal range.

The comparative characteristics of the groups showed that the most pronounced neuroendocrine and ophthalmological disorders were found in patients of the second group with giant pituitary adenomas. Thus, neuroendocrine (growth hormone deficiency, panhypopituitarism, hypopituitarism, diabetes insipidus, infertility, secondary amenorrhea), ophthalmic (bitemporal hemianopsiya, amaurosis, etc.) and brain disorders (pyramidal symptoms, the decrease in reflexes and muscle tone diffuse) were observed in patients with a total growth option for giant adenomas. In patients with giant adenomas of the pituitary gland, first of all there is a decrease in the level of STH, FSH, LH, ACTH, that is, panhypopituitarism with organic brain symptoms. At the same time, in patients with pituitary macroadenomas, predominantly ophthalmic disorders were observed (bitemporal hemianopsiya), as well as neuroendocrine disorders (isolated growth hormone deficit, panhypopituitarism)

The most pronounced neuroendocrine disorders (growth hormone deficiency, panhypopituitarism hypopituitarism, infertility, secondary amenorrhea), ophthalmic (bitemporal hemianopsiya, amaurosis, etc.) and brain violations (pyramidal symptoms, reducing reflexes and muscle tone diffuse) were observed in patients with total growth of giant pituitary tumor.

It should be emphasized that, in general, patients had the decrease in the average values of trop hormones of pituitary glands, but most reliably and often in patients with giant adenomas of the pituitary gland.

## Conclusions

- In all patients with giant pituitary adenomas the neuroendocrine disorders are were increased by the increasing of growth of pituitary tumor.
- The patients with giant pituitary adenomas has a lot of specific (growth hormone deficiency, panhypopituitarism, hypopituitarism, diabetes insipidus, infertility, secondary amenorrhea) and non-specific symptoms (pyramidal symptoms, diffuse reduction of muscle tone, reflexes), depending on the side of growth, tumor sizes.
- In patients with pituitary macroadenomas, predominantly ophthalmic disorders were observed (bitemporal hemianopsiya), as well as neuroendocrine disorders (isolated growth hormone deficit, panhypopituitarism, diabetes insipidus, infertility, secondary amenorrhea).

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