PHYSICAL THERAPY ROLE ON PATIENTS WITH GH-SECRETING ADENOMAS

Anamaria KESE[1], Mihaela N POPESCU[2], Anca Elena GĂNESCU [3], Oana PAVEL[2], Mihaela MORMOE[1], Anca Livia CHIRITA[2], R Elena IONESCU[2]

1.Top Med Bunavestire Hospital
2.University of Medicine and Pharmacy Craiova, Petru Rares no 2, 200349
3.University of Craiova Faculty Of Chemistry , Calea Bucureşti 107, Craiova

ABSTRACT: Pituitary adenomas are benign tumors ; they arise from epithelial pituitary cells and they represent 10-15% of intracranial tumors. They can be found at 3% up to 20% of the population, on autopsy series. Cephalalgia is a precocious symptom which keeps going over the disease. The aspect as a whole of the person who suffers from this disease in the phase of established malady is characteristic: a very flat-shaped body, massive and stubby thus justifying the comparison with a pachyderm. Hands and legs are disproportionally bigger, like paddles, facies is disharmonic, facial features become coarse, with oblate forehead and massive prominent pregnant mandible. The joints disproportionately bigger, have limited, painful movement. The patient also presents visceral hypertrophy with numerous dysfunctions from various apparatus and systems.

Keywords: ***pituitary adenoma, GH hypersecretion, dysmorphism, acromegaly, visceromegaly.***

INTRODUCTION

Pituitary adenomas are benign tumors from the epithelial pituitary cells and they represent 10-15% of intracranial tumors. They can be found at 3% up to 20% of the population, on autopsy galactorrhea syndrome (prolactine excess) or it can be hormonally inactive (dysfunctional clinical tumors) [2],[3]. Furthermore, pituitary adenomas can grow to sizes which can determine compression effects over the neighbouring structures, defending the pituitary insufficiency, vision disorders and, rarely, intracranial hypertension. From the historical point of view pituitary tumors are mostly benign. The adenoma secreted by PRL or prolactine is the most frequent type of secretive pituituray tumor (about 39%), followed by GH secretive adenomas and ACTH secretive tumors. Non-functional tumors represent only 10 % of pituitary adenomas whereas TSH secreting tumors, gonadotrophines or alpha subunits are rare [5]. Regarding the age of apparition, the pituitary hypersomatotropism determines two distinctive clinical forms: gigantism, when it appears in childhood and acromegaly when it appears after the bones overgrowth. Acromegaly has a gradual slow progressive evolution [4],[5],[6]. Cephalalgia is a precocious symptom which maintains over the disease. The aspect as a whole of the person who suffers from this disease in the phase of established malady is characteristic: a very flat-shaped body, stubby and massive thus justifying the comparison with a pachyderm. series [1],[7]. These tumors can be hormonally active; they clinically manifest by acromegaly (excessive secretion of growth hormone), Cushing syndrome (ACTH and secondary of cortisol excess), amenorrhea-Hands and legs are disproportionally bigger, like paddles, the facies is disharmonic, facial features become coarse with oblate forehead, massive prominent pregnant mandible. Although the muscular system is well developed, muscular force is diminished. The joints disproportionately bigger, have limited, painful movement. The patient also presents visceral hypertrophy with numerous dysfunctions from the various systems.

MATERIALS AND METHODS

This study was performed at Craiova Emergency County Hospital, having a retrospective component (after observation files) and a perspective one (by direct supervision), over a 6 months period.

Within the study there were included 19 GH secreting adenomas.

The patients were investigated by determining the GH, taking usual blood analyses and also evaluating the breathing function and making a cardiovascular, psychological evaluation and CT or RMN examination of the GH secreting pituitary tumor.

The present study includes 19 patients with acromagaly who have muscular and joint pain were divided in 2 groups:

group 1 of 8 patients who received nonsteroidal **anti-inflammatory** drugs, analgesic and decontracturant therapy;

group 2 of 11 patients received both nonsteroidal **anti-inflammatory** drugs, analgesic and decontracturant therapy and also physical therapy treatment having the following goals:
increasing the strength and the muscle resistance,
improving the posture and the alignment of the body segments,
the amelioration of the effort capacity,
the amelioration of balance and coordination,
the amelioration of the mobility of the joints,
the re-education of breathing.
In order to keep for as long as possible the advantages offered by kinesiotherapy, the patients have been advised to perform the established program at home too, in the break periods, perhaps completing it with 30 minutes of alert walk on a flat terrain every day.
Participants in this study group exercised 2 days a week for 6 consecutive months.
All patients have received both specific disease treatment and also for the associated pathology.

RESULTS AND DISCUTION

Recent studies mention a 1/1 women/men proportion for the GH secreting adenomas, but in this study we registered 11 women and 8 men with GH secreting adenomas.
Regarding distribution on age groups specific studies showed that the ocurrence of investigated pathology is more frequent for the age group of 40 – 60 years. In our study we found 4 cases (5%) with ages between 40 – 49 years, 7 cases (8,75%) with ages between 50 – 59 years, and only 3 cases (3,75%) with ages between 30 – 39 years, no patient below 30 years and the rest of 5 cases with ages over 60 years.
As for the 19 patients diagnosed with acromegaly there has been performed GH dosing and as a result there were higher values than the upper limit (over 5ng/ml for men or over 10ng/ml for women). At the acromegalic patients the GH average was 20/96ng/ml, with a minimum of 6,8ng/ml and a maximum of 72,7ng/ml

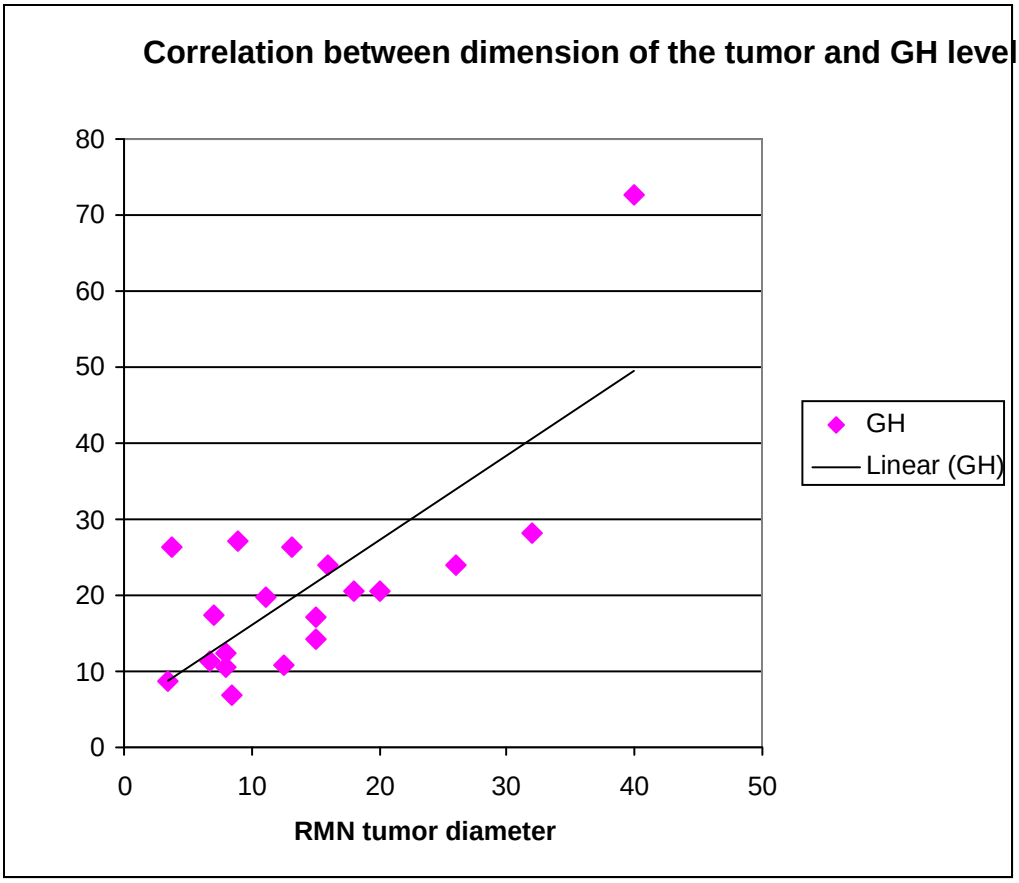

Figure no 1. Correlation between hormonal secretion and tumoral volume

From the graphic above (fig.1) we can conclude that there is a direct correlation between the dimension of the tumor measured RMN and GH secretion (the bigger diameter

of the tumor is, the bigger is the quantity of hormone), because the line of regression has a clear upward slope**.** This is underlined also statistically, the r correlation coefficient of Pearson having the value of 0.752, which overcomes the limit of significance of ±0.456 of r for 19 subjects (17 freedom degrees). Within the acromegaly patients we have obtained the following pathological values (fig.2) :

- Systolic HTA at 8 patienţs (57,9%) and diasistolic HTA at 1 patient (5,3%);
-AV over 80 beats /min at 1 patient (5,3%);
-Glycemia over 110 mg/dl at 2 patienţs (10,5%), with diabetes mellitus type II confirmed at 1 patient;
-Hypercholesterolemia at 9 patients (47,4%);
-Hypertriglyceridemia (triglycerides over 150 mg) at 5 patients (26,3%);
-11 patients (57,9%) had GH secretive macroadenoma GH and 8 patienţs (42,1%) had microadenoma (smaller than 10 mm diameter);
– all patients had hypertrofic osteo-artropaty.
– over 6 month within the exerecise group the physical performance, muscle activity in acromegaly and also cardiovascular performance were improved; total cholesterol, glycemia values and systolic HTA were also decreased at the end of this trainning period.

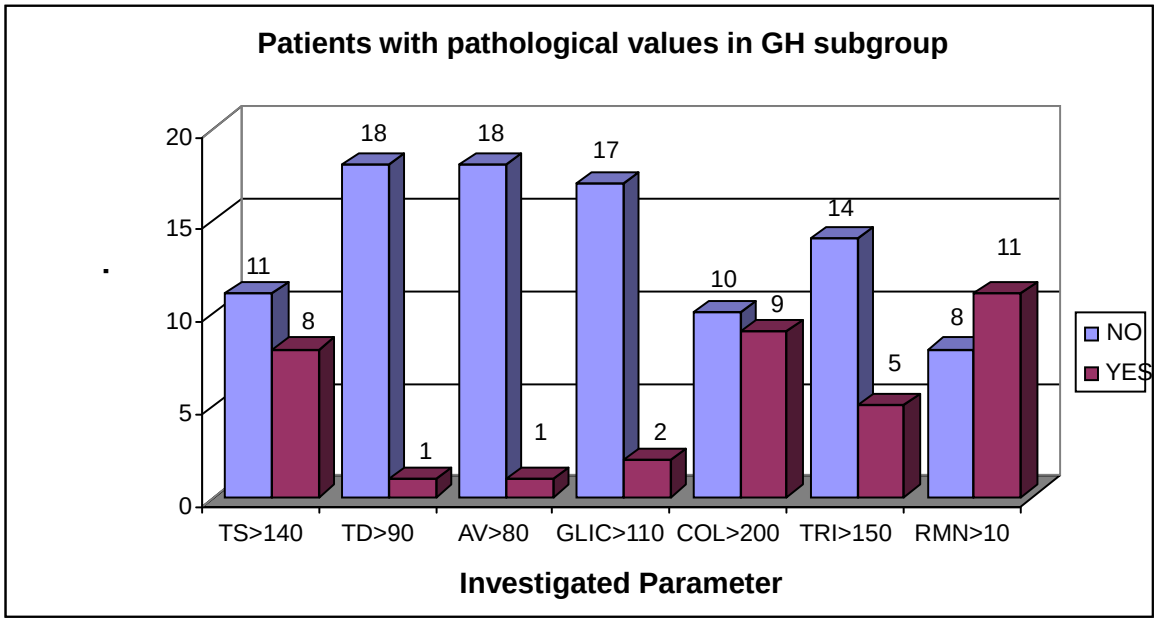

Figure no 2. Pathological values at acromegalic patients

From the 19 patients diagnosed with acromegaly, only 1 patient didn't have an EKG **print,** 4 patients (5%) had cardiomegaly with associative ischemic cardiopathy, 5 patients (6,25%) had ischemic cardiopathy symptoms but 9 patients (11,25%) had an EKG track of normal repose.

At acromegalic patients, lung complications are a growing factor of mortality. In Wright and his collaborators' study there can be seen a three times growth of mortality from breathing causes. Functional breathing tests are abnormal not only at men but also at women. Total pulmonary capacity increases up to 81% at men and 56% at women, 36% present a narrowing of small pipes and 26% have their large bronchias narrowed. (155) Pipes' narrowing and apnea during sleeping, frequent at these patients, contributes to a high level of mortality at acromegalic patients[8,[9]. In this study, 18 patients out of 19, took the breathing functional exploration test. Patients were tested by using spirographic method, measuring the maximum exhaling volume per second (MEVS). After measuring the MEVS there resulted: 10 patients (52% of acromegalic people) didn't have a ventilation dysfunction of gentle obstructive type and 2 patients (11%) had a medium ventilation dysfunction (Katznelson Laurance, 2003).

Depressive disorders and other kinds of disorders associated to acromegaly were: 10% of GH secretive pituitary tumor had a severe depression (closely related to present dysmorphism at these patients) 6,25% had an average depression, 5% a light depression and only 2,5% didn't present any symptoms of depression. The risk of depression at the acromegalic patients is higher than the risk of this psychiatric manifestation at other pituitary affections. Other symptoms noticed at acromegalic patients were : psycho-emotional lability, physical and psychical asthenia, loss of initiative, inhibition, tendency of social isolation, mnestic difficulties, insomnia/terrifying dreams, irritability, depressive ideation, panic attack, fatigue, anxiety, hallucinations [1].

CONCLUSIONS

1. As for the frequency, adenoma secreted by GH represents the second type of pituitary adenoma after prolactinoma being characterized by clinical dysmorphism and multivisceral affectation.
2. Within the studied group we had 11 women and 8 men with a frequent incidence of age group 40-60 years.
3. There was a direct correlation between the dimension of the tumor measured RMN and GH secretion (the larger is the diameter of the tumor the bigger is the quantity of the hormone).
4. 85% of the patients had systolic HTA, 1 patient (5,3%) had HTA diastolic, diabetes mellitus type 2 was found at 1 patient and dyslipidemia was presented at 9 patients.
5. All patients who received exercise therapy had improvements in decreasing total cholesterol, glycemia values and systolic HTA was improved.
6. The trial shows that a constant physical exercise program done by the patients with acromegaly can improve the quality of their lives by ameliorating the algodysfunctional syndrome, the mental state and the mood of the patients.

References

[1] Bistriceanu M.-Endocrinologie clinică, Ed. de Sud, Craiova, 2000.
[2] Dorshkind K, Horseman ND. The roles of prolactin, growth hormone, insulin-like growth factor-1, and thyroid hormones in lymphocyte development and function: insights from genetic models of hormone and hormone receptor deficiency. Endocr Rev 2000 Jun;21:292-312.
[3] Dimaraki EV, Jaffe CA, DeMott Friberg R, et al. Acromegaly apparently normal Gh secretion: implication for diagnosis foolow up. J Clin Endocrinol Metab 2002:87;3537-3542.
[4] Freda PU, Reyes CM, Nuruzzaman AT, et al. Basal and glucosuppressed GH levels less than 1 µg/L in newly diagnosed acromegaly. Pituitary 2003;6:175-180.
[5] Herrmann B.L, Bruch C, Saller B, Bartel T, Ferdin S, Erbel R, Mann K: Acromegaly evidence for a direct relation between disease activity and cardiac dysfunction in patients without ventricular hypertrophy. Clin Endocrinol 2002;56:595-602.
[6] Jaffrain-Rea ML, Moroni C, Baldelli R, et al: Relationship between blood pressure and glucose tolerance in acromegaly. Clinical Endocrinology (Oxf), 2003;54(2): 189-195. Ref. Type: Generic.
[7] Katznelson Laurance: The diagnosis and treatment of acromegaly. The endocrinologist. 2003;13-428-434.
[8] Oruckaptan HH, Senmevism O, Ozcan OE, et al: Pituitary adenomas: results of 684 surgically treated patients and review of the literature. Surg Neurol 2000, 53:211-219.
[9] Popovic V, Leal A, Micic D et al. GH-releasing hormone and GH-releasing peptide-6 for diagnostic testing in GH-deficient adults. Lancet 2000;356:1137-1142

corespondent author:
mihaela.n.popescu99@gmail.com
All authors had the same contribution.